Voice telephony services for deaf people

An independent report for Ofcom

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Foreword

Communications services are important for all citizens, including disabled people who can face particular difficulties when using them. We are firmly committed to ensuring that disabled people can access communications services on an equivalent basis to others, so that they are able to take full advantage of the benefits such services can bring. We therefore proposed in our Access and Inclusion consultation (published in March 2009) to tackle the most critical issues that disabled people face with communications services.

We believe we should start this review by looking at the existing text relay service, which gives hearing impaired people access to the telephone. We know that this service is highly valued by users. However, it relies on technology that is 30 years old. We also know that people with hearing impairments are making increasing use of other telecommunications services, such as email, text messages (SMS) and instant messaging.

It is therefore timely to consider how well the needs of hearing impaired people in the UK are served by the different types of telecommunications services available to them. So, earlier this year, we asked Plum Consulting to conduct an independent study into the telecommunications needs of people with hearing impairments, the extent to which these needs are met by existing telecommunications services and the extent to which new relay services might deliver increased benefits.

We welcome this independent report by Plum Consulting, which significantly furthers our understanding of these issues. In particular, the views of the twenty one people interviewed by Plum, set out in the annexes of the report, provide a vivid and valuable insight into what hearing impaired people want from telecommunications services and also underline the point that different levels of impairment give rise to different needs. We are grateful to all those people and organisations who gave their time to Plum Consulting.

We remain committed to helping ensure necessary improvements are made. However, the issues here are complex and not for Ofcom alone. They require a thorough analysis of costs and benefits, and wide-ranging discussions with government, industry and disability stakeholders. We will set out our further thinking later this year.

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Executive Summary

I The scope of the study

Telecommunications play an important and growing role in all our lives. Today we need telecommunications to find and carry out work, to order and consume many goods and services, to talk to friends and family, and to participate fully in civil society through access to education, culture and democratic processes. Yet for one group of people, those who are severely or profoundly deaf, telecommunications is especially challenging. So in this study we explore the needs of deaf people for telecommunications services, assess whether existing services meet these needs, and consider the extent to which other telecommunication services might meet them better.

II Existing services for deaf people

There are around 850,000 severely and profoundly deaf people in the UK who find it difficult or impossible to use conventional voice telephony services. Most of these people can, and do, make extensive use of e-mail, instant messaging and SMS telecommunications, where they are on an equal footing with hearing people. But our research indicates that deaf people see these services as a complement to, rather than a substitute for, voice telephony. They do not allow natural, fluid conversation in the way that a telephone call does, nor do they convey emotions as easily. And the time lag between sending and receiving e-mails or text messages means that they are often a painfully slow way of communicating.

The basic text relay service, Text Relay[1], funded by BT and operated by the RNID, is designed to offer deaf people a substitute for voice telephony. This service is available nation-wide, 24 hours a day, and at normal telephony prices. But, while it is clearly valued by some of the deaf people we spoke to, it is used on a regular basis by only 11,000 deaf people and use is declining. Respondents in our discussion group reported that the service:

- Provides slow conversation speed, typically 30 words per minute, which leads to low productivity at work and frustrates many users when used for social purposes.
- Does not allow natural, fluid, conversation.
- Often involves the interruption of conversations as relay operators change shifts or take emergency calls.
- Does not work well for inbound calls. Hearing callers often do not know to dial the prefix needed to trigger connection to the relay centre.
- Will not work with the interactive voice response systems used in many call centres.
- Suffers from high hang-up rates by hearing people who receive basic text relay calls.
- Is frequently inaccurate when the conversation includes professional jargon or detailed information. This is a major drawback in many jobs and for many consumer to business transactions.

[1] The brand name TypeTalk is also in common use, and has been left in the verbatim comments from the respondents

III The consequences of these shortcomings

Our research suggests that if deaf people ***at work*** could use voice telephony in the same way as hearing people, they could:

- Be significantly more productive.
- Find it easier to deal with urgent tasks quickly.
- Find it easier to look for and obtain work.
- Increase their opportunities to use teleworking. For example deafblind people, who find it especially difficult to make the daily journey to work, would find working from home much easier.

Our research also suggests that shortcomings in existing telecommunications services mean that, ***at home,*** many deaf people find it stressful and time-consuming to carry out simple transactions such as dealing with their bank or ordering takeaway food. In addition some have lost contact with friends and family who refuse to use the basic text relay service and do not use e-mail. Some depend instead on a spouse or child to relay phone conversations and feel helpless when they are not available.

IV The potential value of new relay services

There are two new relay services, which are now widely available in the US and on a more limited basis in a few EU member states, and which have been used to only a limited extent in the UK:

- The video relay service (VRS), aimed at people who are fluent in British Sign Language, in which a signer uses a two-way video link with the deaf person to relay a conversation; and
- The captioned telephony service, aimed at the severely deaf, in which the relay operator uses voice recognition software to caption the hearing person's voice on the deaf person's terminal display - with a 2 to 3 second delay.

Both these new relay services suffer from some of the same inherent difficulties as basic text relay, in terms of lack of privacy and inaccuracy in relaying complex meaning accurately. But they are typically three to four times faster than basic text relay, and offer substantial improvements in terms of fluidity of conversation and nuanced expression that conveys emotion and helps clarify the intention behind words.

We interacted with 21 deaf respondents to inform this study, all of whom have used one of the two new relay services at work. The levels of their hearing impairment vary. Eight are profoundly deaf, nine are hard of hearing or severely deaf, and four are both visually and hearing impaired. Overall, they believe that the new services have substantial advantages over basic text relay. Their comments, detailed in Annexes A, B and C, include the views that new relay services would:

- Make them more accessible to their hearing colleagues, clients, and bosses.
- Make them significantly more productive at work.
- Provide a useful substitute for face-to-face interpreters as well as for making and receiving telephone calls. Effectively the new relay services give them access to on-line interpreters on an on-demand basis.
- Help them when looking for work and enable them to participate more effectively in teleworking.

- Help reduce feelings of isolation and loneliness, and increase the self confidence of deaf people in their daily lives.
- Make them less dependent on other family members.
- Substantially reduce the time taken and the stress generated when they undertake simple telephone transactions such as ordering goods and services or dealing with their bank.

Our estimates suggest that the captioned telephony service could cost roughly the same as the basic text relay service per minute of use while the unit costs of the video relay service could be considerably higher. But once adjustments are made for the faster conversation speeds offered by the new relay service and for the time saved by the two parties to the conversation, it may be that the new relay services are both more cost efficient than the basic text relay service.

Experiences in the US, where they are widely available, and our discussions with deaf people who have used them in the UK, suggest that demand for the new relay services is likely to be substantial if they are priced at normal telephony rates. This in turn suggests that the total costs of providing these services could be substantial. On the other hand, as our qualitative research shows, the benefits – both economic and social – could also be considerable.

1 Introduction

1.1 The need for a study

Telecommunications play an important and growing role in all our lives. Today we need telecommunications to:

- Find and carry out work.
- Order and consume many goods and services.
- Lead social lives via telecommunication with friends and family.
- Participate fully in civil society through access to education, culture and democratic processes.

For one group of people, those who are severely or profoundly deaf, telecommunications is especially challenging. The introduction of text-based services like e-mail, SMS and instant messaging has significantly improved the lives of this group over the past 10 years[2]. But voice telephony services still play a vital role in our working and social lives. And these services are inherently difficult for severely and profoundly deaf people to use.

1.2 Study objectives and scope

With these concerns in mind, Ofcom has commissioned Plum to carry out a study to:

- Gain a sound understanding of the needs of deaf people regarding their use of telecommunications.
- Assess the extent to which the existing services which are designed to help with telecommunications meet or fail to meet these needs.
- Assess whether there are other telecommunications services which might better meet these needs.
- Consider, in qualitative terms, the costs, economic and social benefits which their introduction might generate.

1.3 The basis for the study findings

In addition to extensive desk research, we have interviewed the stakeholders listed in the left hand column of Figure 1.1 and have carried out primary research with deaf people regarding their telecommunications needs, as indicated in the right hand column. We describe the primary research further in Section 4.1 and present its main findings in Annexes A, B and C.

[2] See for example the findings of *People with Hearing Impairments and Communications Services*, Ofcom, November 2007

Figure 1.1: The stakeholders interviewed

Interviews with representatives from:	Primary research with:
BT	Four deafblind people
The FCC [US telecoms regulator]	Nine captioned telephony users
Hearing Concern Link	Eight video relay users
RNID – regulation and technology	One cochlear implant user
RNID – operations	
Sense	
SignVideo	
TAG	
Teletec[3]	

[3] The CEO of Teletec prior to the company exiting the UK market.

2 The characteristics of the target population

2.1 The scale of the deaf population

Figure 2.1 shows the total number of deaf people in the UK, categorised by age and degree of deafness. We can see that deafness increases significantly with age.

Figure 2.1: The population (in 000s) likely to need special services to use voice telephony

Category	<16	16-60	>60	Total
Moderately deaf : 40- 70 dB HL	14.5	560	3387	3961
Severely deaf: 70-90 dB HL	4.5	70	586	661
Profoundly deaf: >90 dB HL	0.1	35	148	184
severely + profoundly deaf	4.6	105	734	845
UK population	12710	33000	13510	59220
% severely or profoundly deaf	0.04%	0.32%	5.4%	1.4%

Sources: RNID and Institute of Hearing Research

It is difficult to specify the precise boundary at which hearing loss makes voice telephony without some kind of relay service difficult or impossible to use. But, based on discussions with stakeholders, it seems reasonable to include within this category the 845,000 people[4] who are severely or profoundly deaf.

This group is the focus of our study. From now on, when we use the term ***deaf***, we are referring to this group.

2.2 Characteristics of the deaf population

Within this group of 845,000 severely or profoundly deaf people, there is a very varied range of hearing loss and communication methods. But we can, for purposes of analysis, identify four main groups:

- ***Group 1:*** *people with severe hearing loss*. This is by far the largest group, with a population of several hundred thousand. People within this group can typically get some information from listening on the telephone to an inbound voice. This ability might range from understanding most of what is said with some important exceptions[5] to simply understanding the emotions conveyed by the tone of the inbound voice. Their speaking voice in reply is usually easy to understand and they are comfortable with English.

[4] We expect this number to grow slightly in future as the general population over the age of 65 grows by 40% over the next 20 years.

[5] Such as when listening to someone announcing a telephone number.

- ***Group 2:*** *people who are profoundly deaf from birth*. We estimate that there are several tens of thousands of people in this group. Most use British Sign Language (BSL) as their first language and typically have great difficulty in making themselves understood when speaking on the telephone, especially to those who do not know them well. They also, typically, are not proficient in English.[6]
- ***Group 3:*** *people who have become profoundly deaf since birth*, either through the ageing process or through illness. Typically members of this group speak English as their first language, can speak on the phone and lip read to a greater or lesser extent. Some use BSL, some use sign-supported English, and others do not sign at all. Again there are several tens of thousands of people in Group 3.
- ***Group 4:*** *deafblind people.* There are around 23,000 people with both substantial visual and hearing impairments[7]. Few are both totally blind and deaf. Many can read standard or large print, and a substantial proportion is severely rather than profoundly deaf.

Overall we estimate that there are 50,000 to 70,000 people[8] from Groups 2, 3 and 4 who are fluent users of BSL. With the advent of cochlear implants and increased integration of children from Group 2 in the mainstream school system, this group might be declining in number. But this trend is offset by a growing number of deaf people from Group 3 who find BSL a useful and expressive form of communication.

[6] The average reading age of people in this group is just over eight years.

[7] See for example *Making Technology Work*, Sense, 2005.

[8] As estimated by the Department of Work and Pensions.

3 Existing telecommunications services for deaf people in the UK

3.1 The different kinds of relay services

There are currently three distinct relay services available to the world's population of severely and profoundly deaf people to help them make and receive telephone calls with hearing people:

- Basic text relay services
- Video relay services
- Captioned telephony services

In all three cases the calls involve three parties - the deaf person, the hearing person, and the relay operator.

In the case of the ***basic text relay service*** the deaf person might dial a hearing person's number after first dialling a prefix. This automatically brings a relay centre operator into the call. The relay operator announces the nature of the call to the hearing person who then speaks. This is typed by the relay operator and this text appears on the deaf person's phone. The deaf person might then either speak or type his/her response. Box 3.1 provides a fuller description.

The ***video relay service (VRS)*** requires the deaf person to establish a two-way video link with the relay centre before making the call to the hearing person. Once connected, the hearing person speaks to the relay operator, typically a qualified BSL interpreter, who signs via the video link to the deaf person. The deaf person then signs back and the operator speaks to the hearing person.

The ***captioned telephony service*** uses voice recognition software which is trained to recognise the voice of the relay operator. The hearing person speaks to both the deaf person and the relay operator; this is in contrast with the basic text relay service. The relay operator repeats the hearing person's words into their computer, which are converted to text using the voice recognition software. The text appears on the deaf person's terminal, thus providing a caption alongside the hearing person's voice, with a two to three second delay. The deaf person then typically speaks his or her response which the hearing person hears directly.

There are a significant number of variants on these three basic services. The deaf person might access the relay centre using a circuit switched or an IP-based network. And the deaf person might use a specially designed terminal, a PC with suitable software or a mobile phone. When a basic text relay service is accessed via an IP network, it is often referred to as ***IP relay,*** e.g. in the USA.

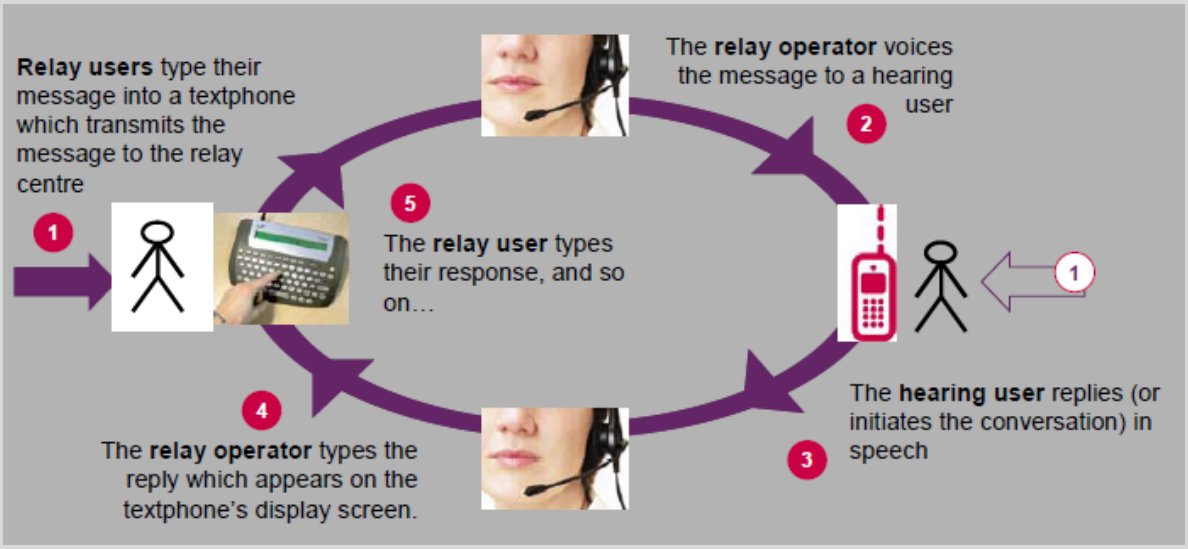
Services are available only on a partial basis across the world. Specifically:

- Basic text relay using a textphone is currently available in 12 of the 27 EU Member States.
- IP access to text relay is available in Belgium, Germany, Denmark and Sweden.
- Video relay is available in Sweden and Germany.
- Captioned telephony does not appear to be currently available in any Member State but is available in 37 of the states of the USA.[9]

[9] Source: *Access and Inclusion; Digital Communications for All*, Ofcom, March 2009

Box 3.1: How the basic text relay service works[10]

The basic text relay service uses live translation by relay assistants of voice into text and vice versa. Relay users type their message into a textphone (see below), which transmits the message to the relay centre. The relay operator voices the message to a hearing user who replies in speech. The relay operator types the reply which appears on the text phone's display screen. The textphone user types their response, and so on.2



4

The relay service offers a two-way live process which can be initiated from a deaf user using a textphone or from a hearing user using a conventional telephone. In both cases the caller dials a prefix before the number they are calling to use the service. Additional features are direct text-to-text communication without the intervention of an operator and voice carry-over, where a hearing impaired user speaks their outgoing messages and receives incoming messages in text: the hearing person's voice is not transmitted to the deaf person. The most significant change to the relay service since its inception occurred in 2001 with the introduction of a gateway functionality, BT's TextDirect. TextDirect displaced the role of relay operators in setting up calls manually and only brought them into the conversation when their translation services were required. It also dispensed with the need for users to register in advance, established a short code access to the relay service using the 1800x range of numbers and offered text equivalents for network tones such as 'number unavailable' or 'busy'.

3.2 The availability of relay services in the UK

Of the three relay services listed above, only the basic text relay service is widely available in the UK. It is funded by BT out of its profits[11], and run by the RNID from a call centre in Liverpool. It currently generates around 8 million minutes of use per annum and volumes are declining at about 5% each year[12] as deaf people switch to SMS, e-mail and, to some extent, instant messaging. Caller line identification (CLI) data from BT suggests that the number of separate users of Text Relay each month is around 11,000 out of a potential market of around 850,000, as estimated in Figure 2.1.

[10] Adapted from *Access and Inclusion; Digital Communications for All*, Ofcom, March 2009.

[11] BT is the universal service provider in the UK and is required to provide services for deaf people as part of its universal service obligations. In the UK the cost of doing this is currently met by BT from its profits.

[12] Statistics from the RNID.

Video relay services are also available in the UK, but on a limited basis during working hours and for work purposes to those people who have been assessed as needing them by an Access to Work adviser[13]. There are currently two main applications of these services:

- To support deaf people in their work, both for making calls and as a replacement of an interpreter. Here the service is funded primarily by the government's Access to Work scheme.
- To support deaf people in the place of an interpreter for appointments in hospitals and local government offices.

We estimate, from our discussions with SignVideo[14], that video relay services currently generate between 50,000 and 100,000 minutes of use per annum and that demand is growing at around 100% each year.

Captioned telephony services were available for some time in the UK, but the service closed at the end of November 2007. It was available during standard work hours and funded primarily through the Government's Access to Work scheme.

3.3 SMS, e-mail and instant messaging

In addition to the basic text relay service, deaf people in the UK can also use text-based services such as SMS, e-mail and instant messaging. These services provide a means for deaf people to communicate on equal footing with hearing people. There are two main exceptions:

- A significant number of deafblind people require Braille readers to use such services.
- Those who are profoundly deaf from birth are often fluent in BSL but are not proficient in English, and so have difficulties with text-based services.

Stakeholders interviewed during our research told us that many people, and especially young people, now prefer these new text based services to the basic text relay service, for which they act as a partial substitute. We consider the question of whether they offer an adequate substitute in the next chapter.

[13] 09.00 to 17.00, Monday to Friday

[14] One of the main providers of video relay services in the UK

4 Do existing services meet the needs of deaf people?

4.1 Introduction

In this chapter we assess the extent to which the existing services described in Chapter 3 meet the needs of deaf people - either at work or at home. We base our assessment on:

- End user research, qualitative in nature, with 21 deaf people. This programme is described in Box 4.1. While only using a relatively small sample, the research provides a useful indicator of the attitudes of deaf people towards telecommunications services.
- A comparison between the characteristics of existing services used by deaf people and those of conventional voice telephony services between hearing people.

Box 4.1: The end user research for the study

Our sample consisted of 21 deaf people who have used either a video relay or captioned telephony service at work or who are deafblind. We chose for the bulk of our sample people with direct experience of these services so as to explore how such services might change the work and social lives of deaf people. We conducted three parallel market research exercises.

In the first we ran three discussion groups involving eight profoundly deaf people who have used a video relay service at work. Findings from these discussion groups are set out in Annex A.

In the second our sample consisted of nine people with severe or profound hearing loss who used the CapTel captioned telephony service at work before it ceased operations at the end of 2007. We started with a discussion group of three people and followed up by asking six people to complete diaries of their telecommunications use for five days (from a Wednesday to a Sunday). Annex B presents the findings of this exercise.

In the third we interviewed, either face to face or via email, four deafblind people. Annex C presents our findings.

4.2 The deaf person at work

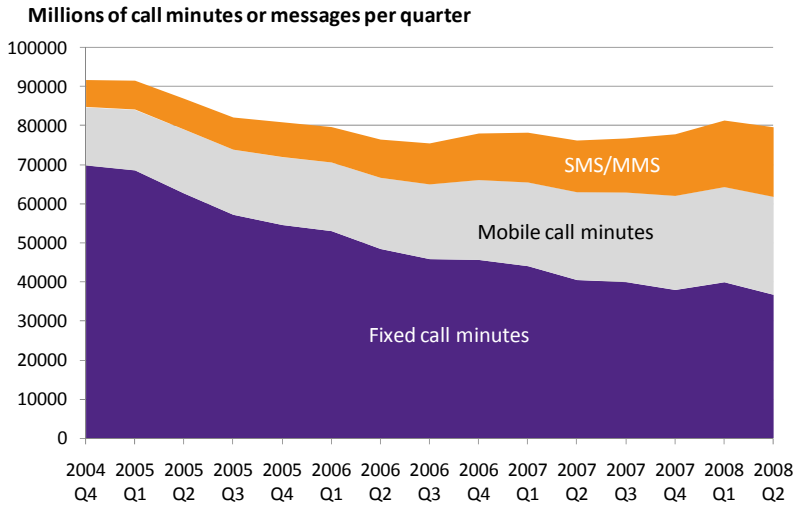
The deaf people in our sample report that they find e-mail and, to a lesser extent, instant messaging and SMS extremely useful. They use these services, which put deaf people on an equal footing with hearing people, extensively in their work. They also report that these services have made a major contribution to their productivity and effectiveness at work. All nine respondents whose first language is English acknowledged that they use email several times a day, every day. For BSL users, the barriers of using English for email, SMS, and instant messaging prevent them from using these services as frequently.

Our research also indicates that deaf people see these services as only partial substitutes for voice telephony. E-mail for example is not suitable for many applications which require a fluid, fully interactive conversation to enable complex decision-making, to seek information in an iterative way, to build consensus or to build relationships with clients and suppliers. Respondents expressed frustration in the many situations where a phone call would be quicker and easier than waiting for a response via email or SMS: "Most of today's events centred around trying to organise a teleconference. The actual time taken for reading/writing emails/SMS was about 25 minutes. In fact it took about three hours in total from start to finish to organise the teleconference...So to me it took three hours to organise."

This point is borne out by the statistics on the relative use of SMS and voice telephony by hearing people as shown in Figure 4.1. This shows that:

- Total voice minutes, fixed and mobile, have declined over the past five years, as users have made increasing use of e-mail[15] and SMS but that
- The volume of voice minutes has now stabilised at a level equivalent to 90 minutes per week[16] per hearing person.

Figure 4.1: Voice minutes vs. SMS in the UK



Source: Ofcom market statistics

The deaf people in our sample see the basic text relay service as the only direct substitute for voice telephony between hearing people. Some use it several times per week; others refuse to use it. For regular users it is often an essential tool which enables them to do work that they would otherwise not be able to do.

[15] We do not have reliable statistics on the volume of e-mails in the UK. But, according to eMarketer, e-mail volumes have grown at around 15% per annum in the US over the past five years and it is reasonable to assume similar growth rates in the UK.

[16] 70 billion call minutes per quarter divided by [60 million people x 13 weeks per quarter].

But there is a general view among respondents and the stakeholders we spoke to that the basic text relay service is of only limited use as a substitute for voice telephony. Respondents report that the basic text relay service:

- Wastes time and reduces productivity because of its slow conversation rate. “I need to set aside ten minutes for a [Type Talk] call which a hearing person would make in a minute.”
- Offers only a limited display on many of the terminals used to access the service. Figure 4.2 illustrates.
- Does not allow natural, fluid, conversation. As a result the deaf professional is unable to have control of a conversation or adequately discuss their work on the phone. “[Type Talk] is hopeless for interviewers. The interviewee just waffles on and I can’t butt in.”
- Often involves the interruption of conversations as relay operators change shifts or take emergency calls.
- Does not work well for inbound calls. Hearing callers often do not know to dial the prefix needed to trigger connection to the relay centre.
- Will not work with the interactive voice response systems used in many call centres.
- Suffers from high hang-up rates when making business calls. The diaries findings of Annex B illustrate this; one respondent who frequently uses the basic text relay service listed in her diary as many as eight hang ups or connection problems in 21 calls[17]. “I made nine phone calls to Sky and eight were disconnected. On the ninth, the Type Talk operator told me the person refused to take my call. I ended up emailing which means I have to wait for a response – if I get one?”
- Is frequently inaccurate when the conversation includes professional jargon or detailed information. This is a major drawback in many jobs.

Figure 4.2: A typical terminal used to access the basic text relay service

[17] These findings are also supported by the City University study *Feasibility of Additional Telephone Relay Services*, November 2006

When communicating at work, deaf people can use interpreters for scheduled meetings and e-mail for simple text communication[18] while some can lip read, which enables them to hold one-to-one meetings with colleagues. So the biggest gaps in work skills for deaf people are using the phone and participating in unscheduled meetings. We consider the first of these gaps below, and discuss the second in Section 5.3.

As a result of the shortcomings in existing telecommunications services set out above, deaf people in our sample report that they are less productive than they would be if they were able to use voice telephony services like hearing people. In particular, our research suggests:

- Not being able to use the phone easily at work is a critical gap in the abilities needed for most jobs. “At work fortunately most communication is face to face or via emails, but if I wanted to advance my career or have a career change I really need far better telecommunication support.”
- When they do use the phone via the basic text relay service, the call takes far longer than an equivalent call by a hearing colleague.
- Deaf people must work around difficulties in using the phone and the limitations of email. Often this means they are forced to depend on their hearing colleagues to take or make their calls. This prevents them from having independence which, in turn, means they are valued less by their employers and restricted in their promotion prospects. “Colleagues take a call for me on a voice telephone and then if need be I call back via Type Talk as my Type Talk phone only works in my office.”
- Participants claim that there are frequent interruptions to their use of the basic text relay service, e.g. for a change in operator. A forced break mid-conversation diminishes its professional nature and can significantly reduce the value of the conversation.
- Respondents indicate that they rarely successfully receive inbound calls because callers often do not realise that they have to insert a prefix before the number when using the basic text relay service. In many cases potential callers prefer email to making a call via the basic text relay service. This limits the accessibility of respondents, which in turn limits their value to employers.
- Calling clients or colleagues can be a particularly stressful process due to frequent hang ups and connection problems. In addition, they must be on their guard for any inaccuracies or mistakes in the text. “When I phone anybody, the Type Talk operator will come online and say, “Hello, this is Type Talk, have you used it before?” And they say “No, thank you, I don’t want to buy anything.” And they hang up. Then I have to find a hearing person and ask them to make the call. Where is my independence?”

They also claim that shortcomings in the existing services:

- Make the same work more stressful than it would be for a hearing person. Difficulties in using the phone, the limitations of e-mail, and the problems of participating in meetings at short notice mean that it is difficult to deal with urgent tasks quickly.
- Make it more difficult for deaf people to find work. There are difficulties in searching for work without using the telephone, whether the goal is to move into employment or to get a better job. Being unable to call or be called by a potential employer easily is a significant obstacle to getting

[18] Although sending messages with higher complexity via email presents problems to some BSL speakers who have limited English language skills.

a job offer[19]. Respondents suggest that some deaf people, when faced with these obstacles, prefer not to deal with the frustrations involved in becoming a part of the workforce. “Being able to have what ‘appears’ to be a relatively ‘normal’ conversation over a telephone would remove the barriers that exist between employer and employee when recruiting staff. If you can’t use a ‘normal’ phone, job options are scarce!”

- Limit opportunities for teleworking by deaf people. UK labour force statistics[20] indicate that the number of part-time or full-time teleworkers has grown from one million to three million over the past decade. To be effective most such workers need to be able to make extensive use of voice telephony services. But, as our analysis above shows, that is not possible for deaf people using the basic text relay service. At the same time the ability to telework effectively would especially suit deaf people of working age. For example respondents in our sample argue that deafblind people, who find it especially difficult to make the daily journey to work, would find working from home much easier. “Travel is a big issue for deafblind people and opportunities for teleworking would be advantageous.”

4.3 The deaf person at home

Just as at work, the deaf people in our end user research report that their ability to communicate at home has been enhanced by the introduction of e-mail, SMS and instant messaging. But again these telecommunications services are seen as a complement to, rather than a substitute for, voice telephony. At the same time a significant proportion of UK households do not have an internet connection, and therefore do not have e-mail or instant messaging[21].

When it comes to voice telephony, our sample reports substantial difficulties in using the basic text relay service at home. The main problems highlighted are as follows:

- Using the basic text relay service to order food, for example, can be a frustrating process. The majority of hearing people are unaware of the basic text relay service and immediately assume the operator must be a telemarketer when they hear the rehearsed introduction. Hang-up rates are therefore high.
- There are significant difficulties in using the basic text relay service to deal with banks, which have a policy of not talking via a third party. Most banks have agreed in principle to waive this rule for deaf people using the basic text relay service following advice from the Information Commissioner. But in practice the bank’s call centre staff are often unaware of this waiver, and it can take 30 minutes of escalating the problem before it is resolved. “I used Type Talk to contact the bank to make a quick transfer of funds. Again, due to the length of time it took for the operator to connect, they had hung up. I had to redial, the Type Talk service had to be explained, and then I was put on hold whilst the person who was taking the call went to see if her manager would allow her to accept this Type Talk call due to confidentiality purposes as a third person was involved in the call. Eventually after a lengthy discussion with assistance from the Type Talk operator explaining that Type Talk is an acceptable confidential service, etc the call was allowed to proceed.”

[19] The Disability Discrimination Act applies here. But it can be difficult to prove breaches and time-consuming to get redress.

[20] http://www.onrec.com/newsstories/16756.asp

[21] Ofcom Technology Tracking survey, Q1 2009

- The basic text relay service does not have the functionality for dialling call centres which use interactive response systems. The operator is not able to type quickly enough to allow the caller to press the appropriate button in time.
- Unless the caller knows to dial the basic text relay service prefix, inbound calls are difficult. The prefix cannot be input into a standard phone number template, and as a result return callers frequently drop the prefix.
- Calling family or friends using the basic text relay service is awkward for both parties to the call and intimate conversations can be embarrassing due to the very obvious presence of a third party operator[22]. In addition there is no opportunity for interruptions, for quick responses, or for a natural conversation. As a result, many of the deaf people in our sample note that they have lost contact with friends and family who refuse to use the service. "It seems robotic. It's not a very human or enjoyable conversation."

Several respondents report that these difficulties have led to feelings of isolation and loneliness. Frustrated with the basic text relay service, a significant proportion of deaf people in our sample also told us that they use other means to communicate by phone. They report that:

- They are often dependent on a spouse or child and feel helpless when they are not around. "If no relative is around to help me the calls will go unanswered and that is not acceptable or very fair to myself or the caller. I don't see why at 40 years of age I should be relying on my parents or husband to help me with calls."
- Those who live alone and do not have this support may never use the phone unless absolutely necessary, further increasing their isolation and lack of contact with the outside world.

In addition some of those who depend on their hearing children for phone communication told us that they feel inadequate, that they are losing authority over their children, and that they are imposing responsibilities on their children at too early an age.

4.4 A comparison of services for deaf and hearing people

In parallel with our work to gather the views of deaf people, we compared the characteristics of existing telecommunications services available to deaf people with those of basic voice telephony. Figure 4.3 presents the comparison. We can see that:

- In its normal mode of use basic text relay seems to offer conversation speeds of 30 words per minute[23] compared with around 170 words per minute for voice telephony between hearing people.
- The existence of a third party means that basic text relay does not offer the privacy, nuanced expression, or fluid conversation available with normal voice telephony.
- E-mail, instant messaging and SMS offer deaf people the same privacy as normal voice telephony, but at much slower conversation speeds and with much less interactivity (i.e. the ability to interrupt and interject in real time). E-mail and SMS appear to typically provide conversation

[22] Use of e-mail or instant messaging avoid this problem but suffers from other drawbacks in terms of slow conversations speeds and lack of interactivity.

[23] This rate increases to perhaps 70 words per minute for the 25% of calls which use voice carryover, in which a deaf person speaks rather than types his or her end of the conversation.

speeds of 15 to 20 words per minute and often involve gaps measured in hours between sending a message and receiving a reply.

These findings are consistent with the claims made by deaf people in our end user research.

Figure 4.3: The characteristics of telecommunications services for the deaf

Measure	Conventional voice telephony	Basic text relay	Email	SMS	Instant messaging
Main set of users	HP	All HIP	All	All	All
Conversation between	HP + HP	HP + HIP	All	All	All
Conversation speed (wpm)[24]	170	30	15	15	30
Fluid, fully real time conversation	Yes	No	No	No	No
Privacy between the two parties	Yes	No	Yes	Yes	Yes
Relay operator obvious to HP	N/A	Yes	N/A	N/A	N/A
Nuanced expression possible	Yes	No	No	No	No
Available to HIP on the move	Yes	Yes with suitable handset	Yes	Yes	Limited
Hang up rates	Low	High	None	None	None
Ability to teleconference	Yes	No	No[25]	No	Yes
Access to call centres	Yes	Yes	Yes but see text	No	No
Access to emergency services	Yes	Yes	No	Soon	No

HP= Hearing person; HIP = Hearing Impaired Person

4.5 Conclusions

In summary the analysis set out above suggests that:

- E-mail, SMS and instant messaging, all relatively new telecommunications services, are of great value to deaf people both at home and work. When using them deaf people are on an equal footing with hearing people.
- These services may act as a partial substitute for voice telephony for both hearing and deaf people. But they do not meet the needs of deaf people for fluid, fully real-time communications - a need which, in hearing people, generates around 90 minutes of voice telephony per week per person.
- Basic text relay services are designed for deaf people to use as a substitute for voice telephony between hearing people. But they compare very poorly on a wide range of measures and their use is declining steadily.

[24] Based on our own use of the services and on conversations with end users

[25] Based on a general response from stakeholders and end users

- Basic text relay services are most frequently used for simple transactions - for example to seek information, query a bill or make a doctor's appointment. However, even when used for these applications basic text relay is much slower than using an alternative relay service (or voice telephony for hearing people). Box 4.2 illustrates.

Box 4.2: The speed of use of a basic text relay service for a call centre inquiry

"As part of our usual demonstration evenings we set a challenge for deaf visitors asking them to call British Rail and ask for a price for a train leaving after 9am to Newcastle from London and check the return times on the same day. One is asked to do it through [basic] text relay and the other via video relay. The time differential is astonishing. We have recorded up to nine times faster via video relay (3.5 minutes against almost 35 minutes on text relay albeit with a strong BSL user and poor typing skills). The fastest typist even had a time difference of five times longer."

Feasibility of Additional Telecommunication Relay Services, City University, January 2006, for Ofcom

Our research suggests that the shortcomings of existing telecommunications services may contribute to deaf people:

- Being less productive and suffer greater stress at work.
- Finding it more difficult to find employment.
- Being less able to participate in teleworking.
- Often feeling isolated, both at home and at work.
- Being more dependent on others, leading to feelings of inadequacy.
- Often feeling cut off from the communications with distant friends and family which hearing people would take for granted.

5 The possible value of new relay services

5.1 Introduction

In this chapter we examine whether the new relay services, specifically the video relay and captioned telephony services described in Section 3, would better meet the needs of deaf people, either at work or at home, than existing telecommunications services. Again we consider two sources of evidence - the findings from our end user research and the characteristics of the new relay services when compared with existing services.

5.2 The characteristics of the new relay services

Figure 5.1 compares the characteristics of the video relay and captioned telephony services with those of the basic text relay service and of voice telephony between hearing people.

Figure 5.1: The characteristics of the new relay services

Measure	Conventional voice telephony	Basic text relay	Captioned telephony	Video relay
Main set of users	HP	All HIP	Severe hearing loss	BSL users
Conversation between	HP + HP	HP + HIP	HP + HIP	HP + HIP
Conversation speed (wpm)[26]	170	30	150	150
Fluid, fully real time conversation	Yes	No	Nearly	Nearly
Privacy between the two parties	Yes	No	No	No
Relay operator obvious to HP	N/A	Yes	No	Yes
Nuanced expression possible	Yes	No	Partial	Partial
Available to HIP on the move	Yes	Yes with suitable handset	Yes on smartphones[27]	Nomadic but not full mobility
Ability to teleconference	Yes	No	Some	Some
Access to call centres	Yes	Yes but see text	Yes	Yes
Access to emergency services	Yes	Yes	Currently no, but a possibility	Currently no, but a possibility

HP= Hearing person; HIP = Hearing Impaired Person

[26] Based on our trials of the services and conversations with market research respondents.

[27] This option has recently become available in the US.

This comparison suggests that the new relay services:

- Are three to four times faster than basic text relay, and offer substantial improvements in terms of natural, fluid conversation and nuanced expression that conveys emotions and helps clarify the intention behind words.
- Suffer from the same lack of privacy between the parties to the conversation as basic text relay. However, in the case of captioned telephony, the relay operator is not so obvious to the parties.
- Do not, in the case of the video relay service, offer full mobility.
- Overall come significantly closer than basic text relay to offering the same functionality as voice telephony between hearing people.

5.3 The impact of using the new relay services

All 21 of the respondents in our research programme have had experience of using either captioned telephony or video relay services at some point in the last three years. When asked about these experiences they make the following points:

- They claim that VRS and captioned telephony made them accessible to their hearing colleagues, clients, and bosses in a way that is not possible with the basic text relay service. The flexibility of the services combined with the possibility of easy fluid conversations made feasible relationships and opportunities that were previously inaccessible. “People would actually communicate. With Type Talk people would phone someone else instead of me, which puts pressure on colleagues and me.”
- They argue that the new services made them significantly more productive at work. For example six of the nine former CapTel users claimed that Captioned telephony had increased their productivity at work by over 20%, while the remaining three claim at least a 5% increase[28]. They argued that this was due to increased ease in calling (no hang ups), increased fluidity and speed of conversation, and increased confidence and independence at work. “It made me much more confident about the times when I was required to use the telephone. It saved me time when time was short – being able to phone and get an immediate response, rather than wait for a reply to my email.”
- They see the new relay services as a useful substitute for face-to-face interpreters as well as for making and receiving telephone calls. This is an issue which goes beyond the needs of deaf people for telecommunications services alone. See Box 5.1 for a discussion.
- They believe that the new relay services would, unlike the basic text relay service, help them when they are looking for work and enable them to participate more effectively in teleworking.
- They would use the new relay services extensively for social purposes, providing it was priced at telephony levels rather than the £1 to £3 per minute which it might cost to run the services. Having experienced the services at work they feel that they would function well at home - both as a way of communicating with friends and families and as a way of dealing with home related problems.

[28] These figures are respondents’ personal estimates.

Box 5.1: The use of relay services as a substitute for face-to-face interpreters[29]

Almost everyone in our sample of deaf working people uses a face-to-face support worker, either a BSL signer or a stenographer, to help them in their work. In some companies these interpreters are based in-house. But in most cases they are booked through a third party, typically by the half day or longer. The interpreter may support the deaf person in a meeting or in one-to-one conversations. These interpreters are of great value. But there are problems:

- BSL interpreters and Speech To Text Reporters are expensive and must be paid for both their travelling and interpreting time. The fees are typically met by the employer or via the Access to Work scheme. But the expense means that use of interpreters is rationed.
- The number of qualified interpreters and STTRs available is limited, especially outside London.
- The lead time in booking an interpreter or STTR is measured in days or weeks. So the amount of time wasted in waiting for support, and in making do when they are not available, is significant. In particular this lead time restricts a deaf worker's ability to participate in unscheduled meetings with colleagues. Several of our respondents reported this as a significant restriction on productivity
- Because there are so few qualified BSL interpreters, deaf people often have to make do with an interpreter with lower certification, particularly if they live outside of a major city. In these circumstances deaf people often worry about the accuracy of the translation.

Respondents argued that the new relay services would in many cases effectively give them access to on-line interpreters on an on-demand basis and that this could help remove many of the problems listed above. There are limitations however when it comes to using relay operators rather than face-to-face interpreters for meetings. It is important that the relay operator can clearly hear what is said, and this requires a well-controlled meeting in which only one person speaks at a time.

However our research suggests that the four groups of deaf people identified in Section 2.2 would be likely to use the new relay services differently:

- The great majority of those in ***Group 1*** (severe hearing loss) would find a ***captioned telephony*** service a substantial improvement on the existing basic text relay service.
- Almost all of those in ***Group 2*** (profoundly deaf from birth) would be helped by the introduction of a ***video relay service*** when making and receiving telephone calls.
- Almost all those in ***Group 3*** (people who have become profoundly deaf since birth) would also benefit from the introduction of the new relay services. Some would prefer to use video relay; others to use captioned telephony.
- The findings of Annex C suggest that the great majority in ***Group 4*** (deafblind people) would also benefit from the new relay services. BSL users with above average residual sight would benefit from a video relay service, while many English speakers might use the captioned telephony service.

The new relay services would need to be adaptable by users to maximise their utility to Group 4. For example the video relay service would be most effective for this group if:

- Signers wore black tops, signed against a plain background, and perhaps wore green or yellow gloves.

[29] We include a discussion of the use of relay services as a substitute for face-to-face interpreters because it is clear from our research that, if the new relay services are introduced, deaf people will want to use them in this way

- The quality of and ease in viewing the video could be improved - perhaps by use of video frame or video augmentation techniques.
- Large screen displays (e.g. 32 inch) were available and users had the option to modify the colour display to maximise the contrast.

At the same time the captioned telephony service should, if it is to meet the needs of deafblind people:

- Offer the ability to tailor the font of the text display by colour and size to suit each user and make it as easy to read as possible.
- Offer those who are totally blind and use captioned telephony with a Braille reader control over the speed with which the text appears so as to match the Braille reading speed.

5.4 The limitations of the new relay services

Our analysis suggests that the new relay services come significantly closer to offering a functional equivalence to voice telephony between hearing people than basic text relay. But there are still significant limitations. For example:

- The presence of relay operators means that, while these services come closer to mimicking voice telephony between hearing people, they will always fall short in terms of privacy, nuanced expression and accuracy. Moreover recent work[30] suggests that we are unlikely to see advances in technology which will remove the need for a relay operator any time soon.
- In the case of the captioned telephony service there is a two to three second delay between the hearing person speaking and the caption appearing on the screen of the deaf person.
- The quality of the video relay service is adequate for signing but not for lip reading.
- End users report that there are often technical difficulties in setting up and/or in using the new relay services.
- Like the basic text relay service, the new relay services are prone to inaccuracy[31]. This can be a problem during work conversation using technical jargon, or, for example, when someone is consulting NHS Direct and high levels of accuracy are important. However the problem is less severe with the new relay services. Given the greater speed and level of interactivity (i.e. the ability to interrupt and interject in real time) either party to the conversation can query inconsistencies more easily.
- The use of human operators means that the new relay services are subject to interruptions as relay operators take breaks or change shift. Again the increased speed of the new relay services ameliorates this problem.
- The new relay services are, in theory, subject to the same hang-up problems as the basic text relay service. In practice service providers and end users of both the captioned telephony and video relay services report few problems here. This might be because they use different scripts when announcing the service to called parties.

[30] See, for example, the work of Professor Moore of the Speech and Hearing Research Group at the University of Sheffield.

[31] For example in the case of captioned telephony the software used for the captioning is typically 99% accurate.

5.5 The unit costs of the new relay services

The unit costs of a relay services depend upon:

- Whether the service is provided on a limited or extensive scale.
- Whether the service is provided 24 hours a day or only during working hours. We are told by service providers that the unit costs in the period between midnight and 08.00 hours are roughly three times those at other times.
- Whether the unit costs include only the basic operating and telecommunications cost of the service or whether they include an element for support and outreach services as well.

We have assembled estimates of the unit costs of the new relay services and the basic text relay service in Figure 5.2.

Figure 5.2: The unit cost of the different telecommunications relay services[32]

Service	Cost per minute (£)	
	Estimate based on UK information	Estimate based on US information [33]
Basic text relay	0.76	0.93
Video relay	2.50[34]	2.85[35]
Captioned telephony	2.00[36]	0.95

These estimates are provided for illustrative purposes. They are based partly on discussion with UK stakeholders who have run the three relay services, and partly on the reported costs of the relay services in the US. We can see that:

- Video relay is more expensive; the extra cost reflects the wage rates of the skilled signers required as video relay operators.
- The unit costs of captioned telephony are far lower in the US than they were in the UK when the service was operational there. These differences reflect much higher economies of scale enjoyed in the US.
- It is beyond the scope of this study to estimate the relative cost efficiency of the three relay services of Figure 5.2. But in making such a comparison it is important to adjust the unit costs of Figure 5.2 to allow for the fact that the flow of information is much faster for captioned telephony and video relay services than for basic text relay. We might reasonably assume that one minute of video relay or captioned telephony use is equivalent to four minutes of use of the basic text relay service based on our own test trials of the services in addition to respondent information.

[32] These are estimates of the cost to the service provider rather than the price to the end user

[33] At $1.4/£ using unit costs derived from the FCC, NECA and Florida PUC documents

[34] Assuming large scale operation

[35] FCC estimate rather than actual compensation rate

[36] Teletec estimate for small scale operation

- The economic cost of a conversation includes not just the cost of providing the service, but also the cost of the time of the people at each end of the call.

When compared on this basis the new relay services may prove significantly more cost efficient than the basic text relay service.

5.6 Demand for the new relay services

The evidence set out earlier in this chapter suggest that demand for the new relay services would be strong if they were unrationed and offered at normal voice telephony price levels. Experience in the US, the only country in which all three relay services are widely available on this basis, confirms this. Figure 5.4 shows that demand for basic text relay[37] in the US is declining or static while demand for captioned telephony and video relay is growing strongly - at 30 to 40% per annum[38].

Figure 5.4: Demand for telecommunications relay services in the US in 2007

Relay service	Call volumes (millions of mins pa)	Rate of change pa over previous 12 months
Basic text relay	59	-30%
IP relay[39]	72	+0%
Captioned telephony[40]	72	+30%
Video relay	96	+40%

Source: Calculated using NECA, FCC and Florida PUC statistics and assuming that there are 5 intrastate minutes of basic text relay and captioned telephony for every 1 minute of interstate service[41]

5.7 Potential social benefits

Our research suggests that the social benefits of introducing the new relay services could be substantial. By providing a closer functional equivalence to voice telephony between two hearing people than existing services, the introduction of the new services could:

- Increase the self confidence of severely and profoundly deaf people in their daily lives.
- Reduce feelings of isolation and loneliness which many deaf people, and especially those living on their own, experience.

[37] Which includes IP relay.

[38] It is important to note that the US call volumes may be inflated by fraudulent use, especially of the IP relay service. But we have no reason to believe that the growth rates in Figure 6.2 are inaccurate.

[39] This is a basic text relay service which uses IP network access.

[40] IP plus PSTN

[41] This assumption is based on conversation with the FCC.

- Allow the great majority of those who are severely or profoundly deaf to communicate directly with family and friends by telephone in a manner which, for the first time, comes close to a conventional voice telephony call.
- Substantially reduce the time taken and the stress generated when deaf people undertake simple telephone transactions such as ordering goods and services or dealing with their bank.
- Make many deaf people, who must now rely on hearing family members, independent when they use the telephone.
- Give deaf people of working age greater satisfaction and self-esteem by increasing their job prospects and widening the opportunity to maximise use of their talents in their work.

The social role of work is important. There are many studies which show that work is important - not just in order to provide an income to pay for material comfort - but also as a mechanism for promoting self-esteem, identity, and social inclusion. Conversely unemployment can isolate people from society, reduce self-confidence, and lead to poorer mental and physical health. According to the New Zealand Government[42] for example

"Paid work has an important role in social wellbeing. It provides people with incomes to meet their basic needs and to contribute to their material comfort, and gives them options for how they live their lives. Paid work is also important for the social contact and sense of self-worth or satisfaction it can give people....Ideally, work should not only be materially rewarding but it should contribute to other aspects of wellbeing. Meeting challenges at work can contribute to a sense of satisfaction and self-worth."

At the same time the European Commission reports that[43]

"The workplace remains a major setting for promoting social inclusion. Access to work is associated with higher levels of income, autonomy, health and well-being, and social networking. Factors which deny access to the workplace generate social exclusion, with consequent costs for the individual and family, the workplace and for society as a whole."

Yet unemployment rates among deaf people are high. According to a study by the RNID[44] unemployment rates among deaf people are four times the national average. The situation is even worse amongst deafblind people. In a survey by Sense of 326 deafblind people[45], 63% of those surveyed who were not studying or retired were unemployed.

5.8 Potential economic benefits

Our research suggests that the introduction of captioned telephony and video relay services would generate three main economic benefits. It is worth noting that, while the first two benefits relate to the use of the new relay services for telecommunications, the last relates to their use as on-line interpreter services.

[42] Paid Work chapter of *The Social Report 2008*, New Zealand Government, 2008

[43] *Employment and disability: back to work strategies*, European Foundation for the Improvement of Living and Working Conditions, 2004

[44] *Opportunity Blocked*, RNID, 2006

[45] *Make technology work*, Sense, 2005

First deaf workers could be more productive with access to relay services which offer something close to a functional equivalent to voice telephony between hearing people. In this respect we note that:

- Not being able to use the phone easily at work is a critical gap in the abilities needed for most jobs.
- Two of the biggest difficulties in the workplace for deaf people are using the phone and participating in unscheduled meetings[46].
- Captioned telephony and video relay services could play a major role in overcoming these difficulties.
- All nine respondents who are familiar with captioned telephony estimate that the new relay service would improve their productivity. This probably reflects the fact that the new relay services would serve as both telecommunications services and as a substitute for face-to-face interpreters.

Secondly the introduction of the new relay services would increase the probability that deaf people are employed. Our research suggests that the introduction of the new relay services could lower the deaf unemployment rate by:

- Making a wider range of jobs available to deaf people. Many jobs require extensive use of the telephone which deaf people can use more easily with the new relay services. This makes them more productive and makes it more likely that their talents will be used to the full.
- Making it easier for deaf people to search for jobs, and to arrange and attend interviews.

This has two economic effects. There is the direct contribution which the additional workers make to the economy. And there is also a reduction in the economic cost of paying unemployed people through the benefits system.

Finally the introduction of the new relay services would, in their role as interpreting services, increase the productivity of support workers, by enabling them to offer their skills on an on-demand basis for the time when they are really needed. The support worker would avoid unproductive travelling time and would be used only when really required. Our discussions revealed that support workers are often booked just in case they are needed, or are booked for two hours when the core requirement is a 15 minute interview. Box 5.2 provides an example, taken from one of our discussions with stakeholders.

Box 5.2: How a video relay services might improve the productivity of support workers

A profoundly deaf person is employed as a school caretaker.

The caretaker meets with the head teacher 12 times each month for 15 minutes per session to discuss problems in maintaining the school and to agree how to deal with them.

At the moment the local authority books an interpreter for 12 sessions at a cost of £300 each, ie £3,600 per month.

With a video relay service each session can be supported at a cost of £39 (£2.60 per minute x 15 minutes), ie £468 per month or seven times less than the face to face option.

[46] As previously discussed, the problem with unscheduled meetings is not caused by existing telecommunications services

6 Possible next steps

6.1 Conclusions

There are around 800,000 people in the UK who, because of severe or profound deafness, have difficulty in using conventional voice telephony. Within this group, there is a significant amount of variation in hearing levels, sight levels, English or BSL fluency, and speech. This means they would benefit from relay services with different characteristics.

The growing use of e-mail, SMS and instant messaging, which put deaf people on an equal footing with hearing people, has significantly improved the lives of most deaf people. But these services are largely a complement to, rather than a substitute for, voice telephony. Unlike telephone calls between hearing people, they do not allow natural, fluid conversation (with parties being able to interject and interrupt freely). Nor do they convey emotions as easily. And the time lag between sending and receiving e-mails or text messages means that they are often a painfully slow way of communicating.

Ofcom research[47] indicates that the existing basic text relay service is highly valued by users. However, as this report illustrates, it does not provide functional equivalence to a telephone call between two hearing people. In particular it is slow[48] and does not allow natural fluid conversation. Its use is largely confined to short and simple transaction-based calls.

Video relay and captioned telephony services, which complement each other in meeting the varied needs of deaf people, are functionally superior to the basic text relay service. They are three to four times faster and enable more free-flowing conversations – making them reasonably close to a functional equivalent to conventional voice telephony.

These new relay services could have a positive impact on the productivity of deaf people ***at work.*** The new relay services could increase the productivity of deaf people, help deaf people search for work and arrange interviews, and enable deaf people to participate more in teleworking. Even without these effects the new relay services could save significant amounts of time for both hearing and deaf people involved in calls by offering conversation speeds which are three to four times faster than basic text relay.

The new relay services, if available at telephony level prices on a 24 hour, or waking hour, basis, could also improve the ***social and home lives*** of deaf people. By providing a closer functional equivalence to voice telephony between two hearing people than the existing relay service, the introduction of the new services could increase self confidence, reduce feelings of isolation and loneliness, substantially reduce the time taken and the stress generated when deaf people undertake simple telephone transactions, and give deaf people of working age greater satisfaction and self-esteem by increasing their job prospects.

6.2 Further issues

What relay services are provided, and how they are regulated and funded, are issues beyond the scope of this study. However, it is important to note that, if the new relay services were provided at

[47] Ofcom's 2007 Consumer Experience Research: http://www.ofcom.org.uk/research/tce/ce07/annex5.pdf

[48] Typically 30 words per minute.

telephony prices 24 hours a day, it is likely that there would be high demand and correspondingly high costs. Rationing (e.g. through a pricing mechanism or call allowance) could help control costs.

There is a wide variety of design objectives which the new services might try to meet. Each of these would need to be evaluated to see what benefits it would bring and how much it would cost. Box 6.1 lists some of the issues which might need to be considered.

Box 6.1: Options for design of new relay services

Should any new services be available in office hours, in waking hours, or 24 hours per day?

Should the services be accessible via circuit switched networks, IP networks or both?

Should the services be designed to handle inbound calls seamlessly? Our research suggests there is a significant imbalance between outbound and inbound traffic via the basic text relay service[49], largely because hearing callers do not understand the need for a prefix when dialling a deaf person via the basic service.

Should the services be made available from mobile phones so that deaf people can make and receive calls anywhere and at any time? Our initial views are that such a requirement is reasonably straightforward to provide on the newest generation of mobile phones for captioned telephony services but more difficult to meet for video relay services.

How can services be designed so as to minimise technical problems?

Should the end user be able to communicate with the relay operator in advance of making a call to discuss the technical terms which might be used?

Should any video relay service provide video of sufficient quality to enable lip reading as well as signing, or offer a choice of signer, e.g. between a BSL or a Sign Supported English relay operator?

[49] With 70% of calls outbound, according to the RNID department which runs the basic text relay service.

Annex A The telecommunications requirements of video relay service users

The sample

Our sample consisted of eight profoundly deaf people who have all used a video relay service at work. Their communication abilities vary considerably. The majority are profoundly deaf from birth, use British Sign Language as their first language and have difficulty in making themselves understood to others by using their voice. Some, however, became profoundly deaf later in life, speak English as a first language, and use sign supported English. Some of these have clear speech and communicate fluently when face-to-face with a hearing person using lip reading. The quotes below refer to respondents by their first initial and job title.

The challenge of communicating at work

We started our discussion by asking respondents how easy it is to use the telephone in their job. They reported that existing voice telephony services are inadequate for profoundly deaf people like themselves. The current text relay service is slow, impractical for most inbound calls, and useful only for the simplest of conversations.

> I need to set aside 10 minutes for a [TypeTalk] call which a hearing person would make in a minute.
>
> ***J – sales director***

We then asked about the impact that this difficulty in using the phone has on their work. Here we found that:

- Not being able to use the phone easily at work is a critical gap in the skills needed for most jobs. Deaf people can use interpreters for scheduled meetings and e-mail for simple text communication[50] while some can lip read, which enables them to hold one-to-one meetings with colleagues.

> Email is fine – but you need the telephone to build relationships.
>
> ***J – sales director***

> I avoid making a phone call at all. So much hassle and frustration – I just hate it.
>
> ***J –sales director***

[50] Although sending messages with higher complexity via email presents problems to some BSL speakers who have limited English language skills.

- So the biggest gaps in work skills for deaf people are limitations in using the phone and problems in participating in unscheduled meetings. The lead time on booking a BSL interpreter is typically one to two weeks, while a substantial percentage of meetings are arranged at a few minutes' or hours' notice.

> If you need [an interpreter] at short notice – forget about it. And not many business meetings are planned so well in advance.
>
> ***H – deaf support worker***

- Deaf people must work around this difficulty in using the phone. Often this means they are less productive than their hearing colleagues. This, in turn, means they are valued less by their employers and restricted in their promotion prospects.

> Not being able to use the phone has a lot to do with me being a sub editor rather than an editor
>
> ***C – journalist***

> Not being able to use the phone means I am perceived as a disabled person with limited employment value
>
> ***J – sales director***

- Difficulty in using the phone and in participating in meetings at short notice means it is difficult to deal with urgent tasks quickly. This makes the same work more stressful than it would be for a hearing person.

> You have an urgent task for which you need an interpreter. But you have to wait one to two days before you can get one to do it
>
> ***H – deaf support worker***

The challenge of looking for work

Correspondents also indicated that their difficulties in using a telephone create a significant barrier to finding work. These are difficulties in searching for work without using the telephone, whether the goal is to move into employment or to get a better job.

> The phone is often an important part of looking for a job. That makes it difficult if you are deaf.
>
> ***C - journalist***

> If there weren't so many communication issues it would be easier to make more contacts, do more networking for job hunting
>
> ***B – software engineer***

Once a deaf person has overcome the obstacles present in searching for a job, finding an interpreter for an interview presents an additional problem. Employers often have a hiring timeline and being forced to wait for a week or more to schedule an interview puts the deaf person at a disadvantage.

Some deaf people when faced with these obstacles prefer not to deal with the frustrations involved in becoming a part of the workforce.

> A lot of people feel isolated sitting at home and if they had communication access it could really help them into the workforce
>
> ***B – software engineer***

Using basic text relay at work

We discussed in some detail how basic text relay helps with using voice telephony at work. This produced the following feedback:

- The majority of our respondents use British Sign Language as their first language, and as a result they are not comfortable reading or writing English. Basic text relay's dependence on written and spoken English limits BSL users' ability to make a call and hold a natural conversation.

> It's draining to always read English text. I get very tired.
>
> ***B – volunteer***

> I want to use my own language - BSL
>
> ***B – software engineer***

- Basic text relay's slow speed wastes valuable time and reduces productivity at work and, in addition, reduces the level of participation a deaf person can have at work. Its speed does not allow basic text relay to be used as a partial substitute for an interpreter in an impromptu meeting, and severely limits a deaf person's ability to make quick calls for work.

> The operator often isn't fast enough – TypeTalk can't follow the pace of a meeting.
>
> ***B – software engineer***

> TypeTalk takes much longer than signing – you can't just have a 10 minute call.
>
> ***B - volunteer***

- Many professional jobs require building relationships with clients and colleagues, but basic text relay does not allow a natural, fluid conversation by which these types of relationships can be built. The deaf professional is unable to have control of a conversation or adequately discuss their work on the phone.

> There is no rapport with the client when I use TypeTalk.
>
> ***J – sales director***

> [TypeTalk is] hopeless for interviewers. The interviewee just waffles on and I can't butt in.
>
> ***C - journalist***

- Many workplaces have specific jargon and terminology relevant to the office and work being done, but basic text relay operators are inaccessible for an introduction to the jargon prior to a conversation, in order to prevent mistakes. The operators are not trained to handle any complex terminology, limiting professional use of basic text relay (or other relay services).

> I can't clarify jargon. With TypeTalk you are very limited to basic communication, so it is not suited to professionals.
>
> ***B – software engineer***

> You can't really brief the operator on the terminology – so often they get it wrong.
>
> ***H – deaf support worker***

- Respondents all agreed that textphone terminals are out of date, and that even new software being created does not have the technology to cope with different platforms or systems, limiting its accessibility to deaf users.

> Software to make PCs into a TT terminal will not work on Apple Macs which are universally used within the newspaper industry
>
> ***C - journalist***

> Analogue-based terminals will not fit with modern digital systems.
>
> ***C - journalist***

- Participants also claimed that there were frequent interruptions to their basic text relay calls, both when an operator took an emergency call and when operators changed shifts. A forced break mid-conversation diminishes its professional nature and can significantly reduce the value of the conversation.
- Respondents indicated that they rarely receive inbound calls due to the common lack of awareness that the basic text relay prefix must be dialled before the number. Their accessibility is limited, which in turn limits their value to employers.

The pros and cons of using face-to-face interpreters

BSL interpreters currently provide the other main means of communication for deaf people. They are the primary means by which a deaf person can participate in a meeting as well as, in many cases, in one-on-one conversations. We asked respondents how frequently they used interpreters and whether the service was adequate for fulfilling the needs which basic text relay did not address. This produced the following feedback:

- Several respondents have in-house interpreters at their work, but they emphasized that this is not the norm. Other respondents agreed that ideally they would each like to have full-time, fully certified interpreters, but that it was neither logistically possible nor an efficient use of time for the interpreter.

> In a hearing dominant environment, I have my interpreter there all the time, but I only use him for a small percentage of the day because I am doing other work as well.
>
> ***A – technology project officer***

- For those who are unable to hire an interpreter full-time, the complications involved in booking and paying for an interpreter contribute to further inefficiencies in their use. The amount of time and money involved in hiring an interpreter means that bookings must be for a significant length of time.

> Access to Work will provide me with an interpreter for work but I feel so pressured to book as much as I can in those three hours since an interpreter has to come for a minimum of three hours
>
> ***B – software engineer***

- There is a limited availability of qualified BSL interpreters in the UK. This makes attending meetings and communicating with colleagues a daily obstacle for a deaf person. The amount of time wasted in waiting for interpreters, and in making do when they are unavailable, is significant.

> I booked an interpreter for an important meeting and due to weather conditions he couldn't come. I had to go back to pen and paper – that was very frustrating.
>
> ***B – software engineer***

> In an emergency I had to wait hours for an interpreter to arrive on site.
>
> ***B – volunteer***

- Because there are so few qualified BSL interpreters, deaf people often have to make do with an interpreter with lower certification, particularly if they live outside of a major city.

> Regional interpreters are not that skilled or experienced – not good for deaf professionals.
>
> ***B – software engineer***

- Several interviewees expressed their distrust of some interpreters and their dislike of their dependence on a translation which they are unable to verify for accuracy.

> I don't fully trust the interpreters. There's a lot of room for mistakes and I can't check.
>
> ***B – volunteer***

Using a video relay service at work

The other primary telecommunication relay service apart from basic text relay is a video relay service called SignVideo, which runs at much smaller capacity but which has been used by all the participants. We asked our respondents to discuss with us how they use VRS at work and how it compares to other services they have used.

- All respondents agreed that using VRS was three to four times faster than using basic text relay and thus allows them to engage in a natural, free flowing conversation.
- Respondents claim that VRS makes them accessible to their hearing colleagues, clients, bosses in a way that had not been possible with basic text relay. The flexibility of the service combined with the possibility of an easy fluid conversation makes possible relationships and opportunities that were previously inaccessible.

> SignVideo made a really big impact at work – it was so much easier. If I meet someone and they have a question I can just call SignVideo and have them interpret on the spot. I've been promoted as a result. It was paramount to gaining my promotion.
>
> ***B - software engineer***

> Now my colleagues actively approach me and ask me questions.
>
> ***B –software engineer***

- VRS is useful for certain meetings (with the relay operator taking the place of an on-site interpreter), but there are limitations. It is important that the relay operator can clearly hear what is said, and this requires a well-controlled meeting in which only one person may speak at a time.
- Respondents believe that video relay provides a much more efficient service for the deaf person both in terms of being able to make calls and having an interpreter on-call for meetings.

> The time taken for VRS is much less than for TypeTalk because I can sign much faster than I can type.
>
> ***A – risk manager***

> You don't have a 30 minute overhead process of welcoming and saying goodbye to the interpreter. You can just switch it on and off.
>
> ***C - journalist***

- Participants also pointed out that video relay saves time for interpreters as well, freeing them to serve more clients more effectively.[51]

> VRS makes more productive use of the interpreter's time. There is no travelling time and the interpreter can work from home.
>
> ***H – deaf support worker***

> With VRS I can book for just 20 minutes, and it frees up the interpreter for other people.
>
> ***B - software engineer***

> VRS avoids the very unproductive behaviour of booking an interpreter just in case (s)he is needed.
>
> ***J – sales manager***

- Deaf people often feel very isolated in a hearing work environment with a language communication barrier. They believe that VRS helps them to cross some of that barrier to feel more comfortable, and therefore often more productive, in the workplace.

> Being able to have VRS at work would cause a 50% reduction in frustration levels.
>
> ***B - volunteer***

> VRS gave me more confidence, gave me more power
>
> ***B - software engineer***

> Deaf culture is very important to me, and working in a hearing environment is isolating – being able to use VRS makes me feel like I've come home.
>
> ***B - software engineer***

> VRS has helped me to develop social relationships at work.
>
> ***A – risk manager***

Improving existing video relay services

Discussion of VRS also led to the following suggestions on potential areas of improvement:

- Respondents would like the option of mobility. They argue that in today's modern world, they are significantly hampered by their inability to be reached at any time throughout the day, in both their work and social life.

> I need a good interpreter who's aware of the language I'm using – if I had a mobile VRS I could have a good interpreter wherever I went.
>
> ***B – software engineer***

> VRS terminals need to be portable and ideally mobile. My terminal is in a meeting room which is often in use by others.
>
> ***J - sales director***

[51] However, interviewees specified that for long periods of time an interpreter is preferable. Staring at a screen for too long can get tiring for the eyes.

- There are still some technology-related issues with the service. Common problems include freezing screens, jarred movements, being blocked by firewalls, and low levels of contrast, all of which make understanding sign language or trying to lip read more difficult.

> The quality is still not great – it gets bad after a while, and then you have to restart the whole thing.
>
> ***J - volunteer***

> There is sometimes distortion on the screen and the speed isn't the fastest.
>
> ***A - risk manager***

> There is a powerful firewall in my office so I have to go to another room to use VRS as the firewall blocks it.
>
> ***B – software engineer***

- Since the current video relay service is only available during business hours and for business purposes, there are both work and social needs that are unmet by the service. The limited hours inhibit the ability of deaf professionals to work late and prevent them from using the service at home.

> It is really difficult if I work late because the hours are only 9-5.
>
> ***C - journalist***

> I have a videophone at home, but the problem is that the service is 9-5 which is when I'm at work.
>
> ***A – risk manager***

- Although all of the participants had tried VRS, many of them were unable to afford the service out of their own pocket and had no other means of getting it. Access to Work did not approve their application or their employer would not pay.

> I tried to apply for Access to Work but they wouldn't give it to me. There were restrictions at every juncture.
>
> ***B - volunteer***

- Respondents believe that VRS should be available at affordable, voice telephony level, prices, as an alternate option set alongside price packages for hearing people.

> I would like a phone package which had inclusive VRS minutes instead of voice minutes.
>
> ***A – risk manager***

> There is no phone plan for the deaf.
>
> ***A – risk manager***

> I would be willing to pay the same amount as a hearing person.
>
> ***J – volunteer***

The challenge of communicating at home

Currently the only available service for deaf people at their homes is the existing text relay service. We asked respondents to talk about any difficulties they face in communicating at home.

- Using basic text relay to call for services or even to order food can be a frustrating process. Common obstacles include high hang up rates and refusals to talk through a third person (particularly in the case of banks). The majority of hearing people are unaware of the basic text relay service and immediately assume the operator must be a telemarketer when they hear the rehearsed introduction.

> Ordering food is impossible – they hang up.
>
> ***B - volunteer***

- Basic text relay does not have the functionality for dialling call centres which use interactive response systems. The operator is not able to type quickly enough to allow the caller to press the appropriate button in time.
- Unless the caller knows to dial the basic text relay prefix, inbound calls are difficult. The prefix cannot be input into a standard 11 digit phone number template, and as a result return callers frequently drop the prefix.

> The dentist tried to call me but didn't know to dial the TypeTalk prefix first, so I couldn't pick up.
>
> ***A – technology project officer***

- Calling family or friends using the basic text relay service is awkward for both parties to the call. There is no opportunity for interruptions, for quick responses, or for a natural conversation.

> It seems robotic. It's not a very human or enjoyable conversation.
>
> ***A – risk manager***

> The spontaneity is missing.
>
> ***B – software engineer***

> We don't naturally talk in paragraphs.
>
> ***J – sales manager***

- Family and friends are often uncomfortable with the obvious third party in the conversation. Intimate conversations can be both awkward and embarrassing.

You never know who you are talking to – and that can be very awkward depending on the subject of your conversation.

B - volunteer

It's intrusive.

J - volunteer

- Many deaf people, frustrated with basic text relay, resort to other means of communication. They often are dependent on a spouse or child to make calls for them, and when their family is not around, feel helpless.

I can only communicate with my US relatives by letter.

H – deaf support worker

I would rather have a family member call the doctor or the bank. But that's not always possible.

B - volunteer

- The lack of adequate access to telecommunications at home for a deaf person contributes to depression and social isolation. Parents who are forced to depend on their hearing children for communication feel inadequate and lose some authority over their children.

Deaf people get very lonely sitting at home because they have no access.

B - volunteer

VRS would empower deaf parents who currently rely on hearing children.

H – deaf support worker

If you had a magic wand...

We asked all participants to imagine their ideal telecommunications service and to further specify what would be its key characteristics. There were some commonly named features essential to any ideal service in the future, several of which correspond to the previously named failures of the basic text relay and video relay services:

- Open 24 hours a day at normal telephony rates.
- Choice of interpreter in terms of skills base (BSL versus Sign Supported English).
- Simplicity and ease of use.
- Availability on a mobile device.
- A service which enables lip-reading.
- A service which can take inbound calls seamlessly.

We also heard some more far-reaching ideas for future technology, from which it is possible to glean some of the communication needs of deaf people.

- A service in which the user just needs to access a web server and the service provider deals with all the technical problems.
- A service which combines Captioned Telephony and VRS.
- The ability to see the other party to the call (as well as the signer) to get visual clues on their emotional state – a split screen.
- An interpreting robot, in particular one with the ability to do tactile signing.
- Holograms.

Annex B The telecommunications requirements of captioned telephony users

The sample

Our sample consisted of nine hard of hearing or severely deaf people who had used Teletec's CapTel service at work while it was available. Six of these completed a diary and questionnaire about their daily communications and their experience with CapTel, while we conducted a group discussion with the other three. All nine are fluent in English, have clear speech, and are generally able to cope in face to face conversation with the help of lip reading. The quotes below refer to respondents by their first initial and job title.

The challenge of communicating at work

In both the diaries and as part of the discussions, a large portion of our questions were geared towards finding out about life at work and their ability or inability to communicate in their job. All of our respondents work in a primarily hearing environment, with minimal deaf awareness training, which can lead to high stress and frustration levels.

> I don't wake up every day and think that I am a deaf person. I just want to get on with my life but have to be constantly reminded when facing everyday challenges in my work and home life surrounding communications and the lack of them for deaf people
>
> ***S – grants officer***

> I retired from my business because it was affecting my health, my mental health, from the stress point of view
>
> ***P - accountant***

> The majority of people with some hearing difficulty rely on spoken English and live in the hearing world – yet these people are not being catered for and tend to muddle along as best they can with normal phones
>
> ***J – software developer***

The advent of email and SMS has given respondents some access to equivalent communication, and the helpfulness of these technologies is obvious given that all nine people in the sample state that they use email every day, several times a day for work, far more than any other method of correspondence. However, there are situations where email and SMS are not the most effective or efficient methods of contacting clients or colleagues at work.

> When undertaking visits for my job I have to rely on the use of mobile text messages to the grant holder. This is not practical as I have no way of knowing if the messages have reached them successfully
>
> ***S – grants officer***

> I would have preferred to make a phone call to my colleague in another office about my placement, as I need to know the dates soon and I know that this colleague is quite slow at responding to emails.
>
> ***J – mechanical engineer***

Most of today's events centred around trying to organise a teleconference. The actual time taken for reading/writing emails/SMS was about 25 minutes. In fact, it took about three hours in total from start to finish to organise the teleconference...So to me it took three hours to organise.

A – European quality manager

Most suppliers prefer to use the phone as it gets a much quicker response to queries. And I am often asked by my boss to 'give a supplier a quick call' to find out information. 90% of the time I end up emailing because I don't have confidence to phone. CapTel would enable me to phone the supplier direct and get a fast response to my question – and keep my boss happy! And build a relationship/contact with the supplier that would be useful in the future.

J – mechanical engineer

We found that most people in this sample are able to communicate fairly effectively in one-to-one in-person situations with the help of lip reading and some residual hearing. This overcomes some difficulties in communicating at work, but still leaves a significant gap.

I do find that just as when I was talking to you just now, one-to-one, I still tend to pick up a lot...you learn the tricks of being deaf. But when it comes to telephones, you don't have the ability to have eye contact or lipread.

P - accountant

At work fortunately most communication is face to face or via emails, but if I wanted to advance my career or have a career change I really need far better telecommunication support

J – software developer

However, large meetings cause much bigger problems. Booking a speech to text reporter can take up to a month, which limits participation in meetings only to those scheduled far in advance. In a typical work environment, most meetings are only arranged with a day or two's notice or less.

I couldn't participate in the conference call as TypeTalk doesn't enable me to do so. This was very frustrating as I wanted to be involved in this meeting since I have a lot of thoughts and experience and wanted to have some influence.

J – software developer

if I wanted to have a meeting in Scotland then I have got to book one in advance. That doesn't work in business because people say "Let's get together and have a meeting"

P - accountant

Our respondents believe that the current relay service, Text Relay, is impractical for professional calls for reasons we discuss later in the annex. As a result, they often avoid using the telephone which limits the type of work they are able to do.

> The main problem is lack of decent phone access which also stops me from pursuing a management role
>
> ***J – software developer***

> I do know when I don't have a success, and I know that at the moment if I try to make a telephone call, I can't be the businessman that I want to be because I have to use either Typetalk or my wife and it takes away my own personality
>
> ***P - accountant***

Respondents are forced to rely on colleagues to adequately communicate for them, which prevents them from having the independence crucial to being an effective and efficient professional. Their employers are less able to rely on them as they are less productive than their colleagues.

> At work if a person won't take my TypeTalk call, I have to get a colleague to do that for me
>
> ***K – garage management officer***

> Colleagues take a call for me on a voice telephone and then if need be I call back via TypeTalk as my TypeTalk phone only works in my office
>
> ***A – European quality manager***

> My colleague left her desk to go and seek some files, her telephone rang, and I was unable to assist as you cannot transfer calls on Type Talk. I had to get other colleague in another department to take the call.
>
> ***S – grants officer***

The challenge of looking for work

Respondents argue that looking for work is a particularly stressful endeavour for deaf people. Being unable to call or be called by a potential employer presents a barrier that can only partially be overcome by the use of email and the internet.

> You have to go in to the employment centre, talk to people face-to-face, everything is face-to-face or letter or E-mail. You have other things but not phone, when you are trying to do anything without a phone, it is impossible. Not impossible but very difficult.
>
> ***T – career advisor***

Interviews present an additional challenge. The time lag involved in booking a speech to text reporter can prevent an interview from taking place for weeks, losing valuable time. Respondents expressed frustration that they could not hold a telephone interview, and in addition had to prove to the potential employer that lack of an adequate telephony communication would not affect their ability to do the job.

> Being able to have what 'appears' to be a relatively 'normal' conversation over a telephone would remove the barriers that exist between employer and employee when recruiting staff. If you can't use a 'normal' phone, job options are scarce!"
>
> ***K – garage management officer***

> I found the problem was it is difficult to approach employers and to present your ability, all they see is the disability and Typetalk is another complication...Basically it presents a brick wall and you have to find an employer that understands that being deaf doesn't mean you are stupid, it just means you have problems using the phone.
>
> ***T – career advisor***

Using basic text relay at work

Feedback on Text Relay, the current main relay service, closely mirrored that which we found from speaking to the video relay respondents, with some exceptions, most of which stem primarily from the language gap between BSL and English. Some of the respondents refuse to use the service, while others find that it is a lifeline at work and enables them to do work they would not be able to do otherwise. Five of the nine respondents in our sample use basic text relay several times a week or more, while the other four avoid it whenever possible, using it once a month or less often.

> TypeTalk allows you to actually communicate at times. You are not so isolated as you can phone people.
>
> ***K – garage management officer***

> I really hate TypeTalk and avoid it as much as possible
>
> ***J – software developer***

> TypeTalk lacks professionalism.
>
> ***A – European quality manager***

> It has been a life line at work, but it does have its problems.
>
> ***T – career advisor***

Respondents disagree on the accuracy of basic text relay. Some express their frustration with the frequent errors operators make, particularly with details such as numbers, while others compare its accuracy favourably to captioned telephony. However, most articulate an interest in being able to speak to the operator before a conversation, particularly if it is work-related and could get quite technical, as inaccuracies in a work conversation lead to mistakes in work.

> The text is clear and reasonably accurate
>
> ***J – software developer***

> It would be good to speak to the operator before you start phoning
>
> ***K – garage management officer***

> The Typetalk operator doesn't always get it right when they are typing, particularly with numbers and addresses, the fine detail. So I always have to double check, and it takes a long time with double checking - no that is not right, do it again
>
> ***T – career advisor***

Everyone in our sample agreed that the speed of basic text relay is a particularly inhibiting aspect to any conversation and makes any lengthy or complex conversation impossible.

> Text replies are slow – the concept of a "conversation" is therefore inhibited due to this lack of speed.
>
> ***A – European quality manager***

> The operators are very slow. I am waiting and they are going "Hello, hello, hello" and that makes me angry.
>
> ***T – career advisor***

Related to the issue of speed is the feeling that basic text relay lacks the fluidity and seamlessness inherent to a productive conversation. Respondents dislike their inability to interrupt the other party and that they are forced to take turns without feedback. This awkwardness reduces others' willingness to call deaf people and prevents them from holding professional conversations in situations other than face-to-face.

> It is unnatural – I don't like having to take turns in speaking, and not being able to interrupt, and not being able to hear the other person at all – not even a laugh
>
> ***J – software developer***

> The problem with Typetalk is that it is not seamless. When you ring someone the operator actually speaks to them first. And then the talk progresses as if it was like a radio phone call on VHF. You are almost saying "Over and out!"...you have to say "Go ahead!' Then they speak, you then say "Go ahead". It takes the natural conversation away from the telephone call.
>
> ***P - accountant***

> Conversation is rather inhibited due to having to take turns and not being able to interrupt. This makes me (and most likely the other person too), wary of talking for too long as you're wondering if the other person is getting frustrated at not being able to interrupt and make a point or correct you. Also you want feedback and assurance the other person is listening to you – even a simple yes reassures you to continue talking. As it is, it makes you keep things very brief, impersonal and doesn't encourage you to express yourself anywhere near as much as you would face to face or with CapTel calls…I even feel I can be more expressive and chatty using MSN Messenger or emails, than with TypeTalk
>
> ***J – software developer***

Participants all commented on the high hang up rates they experience when using basic text relay for calls. One recurrent problem is the delay between the start of the call and the operator's entry into the conversation. The called party will then hang up, thinking there is no one on the line.

> There are delays in the initial start of the call, while you are waiting for an operator contact, as the telephone number has been rung and you are already connected to the caller. If the operator does not kick in immediately then the called party often hangs up.
>
> ***S – grants officer***

> Quite often the call is answered before a TypeTalk operator is available. The other person then hangs up because they don't think anyone is on the line. This happens quite often, and the operator has to redial.
>
> ***A – European quality manager***

Even in the situations where the operator is able to get through on time, the rehearsed introduction to the service will often induce a hang up, forcing the deaf person to try again.

> When I phone anybody, the Typetalk operator will come online and say "Hello, this is Typetalk, have you used it before?" And they say "No thank you, I don't want to buy anything." And they hang up. Then I have to find a hearing person and ask them to make the call. Where is my independence?
>
> ***T – career advisor***

> With Typetalk, the operator goes straight through to them and says "Have you ever used Typetalk before?" and they might say "I really don't have time for this!" that happens very regularly. Particularly in the credit crunch now where people are a little bit on edge!
>
> ***P - accountant***

> Sometimes I have had to phone a resident again on a 'normal phone' to say 'You just hung up on me…I need to use TypeTalk because I'm deaf. I'm going to call you again on TypeTalk. If you don't want to speak to me that way, I can't help you.' And then phone again.
>
> ***K – garage management officer***

The whole process frequently takes several times as long as a voice telephony call just to reach the other party. Respondents who frequently use basic text relay at work listed in their diaries as many as eight hang ups or connection problems in 21 calls, where only half that number of calls would have sufficed. This is a significant loss in productivity and an inefficient use of time.

> It is so frustrating trying to contact people when they keep hanging up on you or refuse a call. It is so time consuming
>
> ***K – garage management officer***

> I have to stay on the phone for a longer time with TypeTalk because if they get through and say "no one's online", they ask, "do you want to try again?" you say "yes please". Then an answerphone comes on, so they ask if you "want to try again to hear message and/or leave a message?" You say "yes please" and they dial again. Three calls to leave one short message!!
>
> ***K – garage management officer***

> I was delayed at home for personal reasons and wanted to let my Programme Manager know that I could possibly be late. I rang from home using TypeTalk, took a while at this busy time of day for an operator to become connected. During this time the office switchboard person had hung up as they thought that nobody was on the line. I then had to re-dial again, my TypeTalk call had to be explained and then the switchboard tried to transfer me to my Programme Managers telephone to explain my lateness. The delay again in connection meant that I missed the start of the answer phone message left on my Managers direct line phone and had to redial to simply leave one short message.
>
> ***S – grants officer***

Most respondents agree that these hang up rates are not the fault of the basic text relay operators, who are generally helpful and polite, but that there are exceptions.

> Some TypeTalk operators are really helpful but some just disconnect on you especially at busy times
>
> ***K – garage management officer***

> Operators are good, well mannered, polite, understanding of problems and frustrations with the system
>
> ***A – European quality manager***

According to our participants, there are also a lot of problems with taking inbound calls. Most of these have to do with the required basic text relay prefix, as it does not fit into a standard 11 digit phone number template and people often do not know to dial it before the number. There is also a general lack of awareness of basic text relay and how to use the system among hearing people, which prevents many from calling the deaf person at all. This limits their accessibility to clients and colleagues, reducing their usefulness at their job. This is also frustrating for the client or colleague trying to reach the deaf person.

> The TypeTalk prefix makes the number too long for most computer address, so people can't take your number down and ring you direct.
>
> ***P - accountant***

> My phone will ring, I'll pick it up and press text and they'll put it down. Then they ring again and do the same thing. There is a message that says to 'phone 18002' – but it doesn't say 'phone 18002 and the code and the number.
>
> ***K – garage management officer***

> A grant holder rang my direct number without using the 18002 prefix for Type Talk, was unable to make contact with me, in frustration rang the Switchboard, who again couldn't transfer the call as you cannot do that with Type Talk, so they had to explain to the grant holder that they must use the 18002 prefix to contact me on Type Talk. The grant holder had to make a 3rd telephone call to get in touch with me, wait for operator assistance, and then be connected after having the service explained.
>
> ***S – grants officer***

> Grant holder refrained from using Type Talk as experienced delays in being connected to an operator, too many digits to dial and not confident using the service
>
> ***S – grants officer***

Limitations in equipment and mobility have prevented some respondents from having access to the basic text relay system in more than one location or at all. When travelling or in another office, deaf people have no access and cannot be contacted by others.

> Text phones only work using an analogue line. Nearly all modern phone lines are digital. This also means that I cannot take my text phone to other offices due to absence of analogue lines.
>
> ***A – European quality manager***

> "TypeTalk would be difficult to set up in my office, where all the phones are IP phones. I would have to get a separate BT line installed for me."
>
> ***J – mechanical engineer***

> With Typetalk you need special handset. You are tied to that handset/textphone
>
> ***T – career advisor***

> If I'm seeing clients or other development/consulting teams in another office...it means having no practical means of using the phone since internet relay is not available...and mobile phones cannot be used easily
>
> ***J – software developer***

Using a captioned telephony service at work

There is currently no captioned telephony service available in the UK, but all of our respondents had used Teletec's CapTel at work before it closed in late 2007. We asked them to tell us about their use of CapTel at their work and how it compared to basic text relay. All of our respondents stated that CapTel had increased their productivity at work by at least 5%, while 6 out of 9 stated that the change was over 20%.

Some of this increased productivity was due to the quick speed of the service – participants claimed that a conversation ran at close to normal voice telephony speeds.

> I would say CapTel was very natural. It was slightly slower but most people got over it. I had about 3 people notice...in about one year...Out of everyone I called and I am on the phone every day.
>
> ***T – career advisor***

> With Captel it would almost sound like a normal call. Very slight delay. With Typetalk, it took over twice as long.
>
> ***P - accountant***

Some of the increased productivity was due to their new ability to make quick phone calls rather than resorting to email.

> It made me much more confident about the times when I was required to use the telephone. It saved me time when time was short – being able to phone and get an immediate response, rather than wait for a reply to my email.
>
> ***J – mechanical engineer***

> "Using Captel takes 50% less time than emails - composing emails, checking them for spelling and wording, sending and then waiting for response."
>
> ***S – grants officer***

> I could immediately discuss issues. This is particularly important with those in foreign offices who are at the end of their day.
>
> ***J – software developer***

CapTel also replaced the need to hire speech to text reporters in some situations and, with some caveats, allowed respondents to participate in short-notice meetings and conference calls.

> I don't use speech to text reporters as they require four weeks notice. CapTel just needed one days notice
>
> ***J – software developer***

> Using Captel in a meeting situation would cut down again on 50% less time than using a note taker as would be involved in the meeting from the start to the finish and no time would be needed after to reread the notes and then discuss in follow up meeting what points I didn't understand and where I should have given some feedback or input to the meeting.
>
> ***S – grants officer***

Respondents note that the reduction of hang up rates and the ability to go straight through to the other party without an in-between party also significantly reduced time.

> Calling on Captel/WebCaptel takes 50% less time as fewer digits to dial, no waiting around for the operator to be connected and call 9 times out of 10 is completed in one attempt and not several redialing attempts. Call time is reduced as you don't have to wait for the operator to type the text after each section of the conversation
>
> ***S – grants officer***

> It is such an effort sometimes to even make contact via TypeTalk – people often hanging up when they phone in or I phone out. It was so much quicker with CapTel and I wasn't hung up on!
>
> ***K – garage management officer***

The speed of the captioning and the ability to make calls easily gave the deaf people in our sample the ability to have a close to normal conversation on the phone. All respondents were happy that they could feel on par with the other party on the line.

> You could really have communication without people knowing you were deaf
>
> ***K – garage management officer***

> I can have an almost normal conversation on the telephone, feel like a normal person and not being constantly reminded that I am deaf
>
> ***S – grants officer***

> It makes me more equal with hearing people
>
> ***J – software developer***

Participants in our study feel that basic text relay needlessly separates them from the hearing world, more so than their deafness did originally. They feel that having the CapTel service allowed them to work more easily in a hearing environment.

> TypeTalk…forces them to be more deaf than they are by making their hearing difficulties stand out more, and by denying any ability to hear at all. Also if you've grown up being used to normal voice calls, it's much harder to adapt to TypeTalk than it would be to adjust to Captel
>
> ***J – software developer***

> Captel let me become very much on a par with any other person at that stage. Losing that and going back to Typetalk really puts me back down into a situation where people think you are stupid
>
> ***P - accountant***

> I did not hesitate to pick up the phone and ring anyone with CapTel, but now I'm asking my Palantypist to make all my phone calls for me because I hate using Typetalk. It is a problematic, the reactions of other people to TypeTalk has put me off it. With Captel people did not realise I was deaf
>
> ***T – career advisor***

Respondents believe that CapTel allowed them to conduct a normal conversation in which they could have control and build a rapport with colleagues and clients.

> As compared to Type Talk, it had a much faster connection time, no operator interference and you could have a normal conversation - not like with type talk having to say Go Ahead after each question and then waiting for the answers. This could be a normal conversation with interruptions when required
>
> ***S – grants officer***

> I liked that the person at the other end of the line doesn't even need to know you're using the help of an operator – TypeTalk is very intrusive in that respect
>
> ***J – mechanical engineer***

The ability to hear some sound in addition to seeing the captions, despite not being able to distinguish words, allowed respondents to engage with clients more effectively via hearing tones and emotion.

> CapTel was very important as people in different countries have different emotions. The fact that I could "hear" these colleagues helped me to assess these emotions."
>
> ***A – European quality manager***

As a result of the increased ease and speed of conversation, respondents note that their employers and colleagues felt more at ease with approaching them with questions or for general discussions.

> People would actually communicate. With TypeTalk people would phone someone else instead of me which puts pressure on colleagues and me. I get upset and some colleagues get angry with me
>
> ***K – garage management officer***

> I could clarify things by phone, if they didn't understand my email fully
>
> ***J – mechanical engineer***

> My work colleagues became more confident in discussing matters on the phone. The relay assistant became invisible and unless I told anyone it was a relayed call they wouldn't have known.
>
> ***A – European quality manager***

> CapTel, people would call me, and I'd be more socially involved
>
> ***J – software developer***

CapTel's capacity to take inbound calls also allowed for increased interaction with the other party and increased the level of responsibility our respondents could take on.

> It gave me the ability to be able to transfer and take internal telephone calls from the switchboard saving callers from having to re-dial using the 18002 Type Talk prefix number
>
> ***S – grants officer***

> When the Captel came on, I was very glad because I could communicate equally with anybody on the telephone system. Also I could receive the calls directly to my phone line at work. I could pick it up.
>
> ***P - accountant***

All of these factors in turn contributed to respondents' confidence at work. Respondents feel that their confidence in their ability to communicate independently and successfully in turn improved their professional value.

> WebCapTel was fantastic. When the service was pulled, my confidence in using the telephone took a huge battering – I was very upset and refused to use the phone at work at all, until my boss insisted that I had to. Without Web CapTel, using the telephone is a part of my job that I am close to hating/dreading, whereas before I could take it in stride, knowing that what I couldn't hear, the operator would, and it would appear on the screen in a few seconds
>
> ***J – mechanical engineer***

> it is more about the confidence that Captel gave me, I didn't hesitate to pick up the phone...with Captel I was able to be myself and there was no third person in the call really. It was more personal and you could build a rapport more easily with someone you didn't know.
>
> ***T – career advisor***

> It made 110% improvement to my working life...It raised my confidence when using the telephone, and grant holders found this method of communication more professional and less time consuming than using TypeTalk.
>
> ***S – grants officer***

> Really every time I use Captel I had a successful conversation and I was the person that I was before I lost my hearing, if you like, with that system...it gave me an independence, and let me be on a par with my colleagues at work as far as telephone communication was concerned. It improved the efficiency of my work.
>
> ***P - accountant***

Improving the captioned telephony service

Questions regarding the captioned telephony service also led to the following thoughts on room for improvement:

- Respondents would like a more affordable and widely available service. CapTel was over a pound per minute, and although most of their phone bills at work were paid for by Access to Work, they want to be able to afford to use it outside of work. CapTel was only open during standard working hours, so respondents also would like a 24/7 service so that they can use it at home, to work late, or to search for other work opportunities.

> The main issue I had with the service was that it was very expensive, even if the hours were extended to all day and every day I would not be able to afford to make a call using this system which is discriminating and unjust as why because I need a bit of assistance on the telephone to lead a normal life be penalised even more with more expense when I want to make a telephone call. After all I sure didn't ask to be deaf!
>
> ***S – grants officer***

> It was extremely expensive because Captel in those days was 1.25 per minute, plus VAT, on top of added telephone costs!
>
> ***P - accountant***

> CapTel users by and large were able to claim expenses from Access To Work, but excluded those who couldn't. We would not be able to finance social calls at cost of 80p to 125p per minute...If I were unemployed, I would have no access to Access To Work at all, unable to make phone calls to prospective employers etc
>
> ***P – information manager***

- Respondents also would hope for the option of mobility. Many of their jobs require some work outside of the office, and their ability to do so is hampered by their inability to access any relay services on their mobile phones.

> Deaf people have been left behind in the mobile Telecoms revolution...mobile telephony is something which everyone should have whether in business, employment or whatever.
>
> ***P - accountant***

- Both the initial delay when signing onto CapTel and the smaller delays throughout the conversation also created some problems for respondents. Most stated that they managed nonetheless but that it was a sometimes annoying aspect of the system.

There was a slight delay of 6 seconds at the initial start of the call. If persons whom I was calling were not aware that I was deaf, their speech was sometimes very quick and I had to ask them to repeat the start of the conversation and slow down.

S – grants officer

The 3-5 second delay between speech and captioning appearing is not ideal but perhaps cannot be avoided

J – mechanical engineer

The delay on CapTel was also a problem. I had to pretend I'd dropped my pen or something whilst I waited to read the words that CapTel typed."

K – garage management officer

- Difficulties with getting an operator sometimes hampered respondent's abilities to make quick phone calls for work. This limitation reduced their efficiency and independence at their job.

There were frequent times when I couldn't get an operator

A – European quality manager

At busy times it was hard to get hold of an operator

J – mechanical engineer

I regularly could not get a line

J – head of immunisation policy

- Respondents also questioned the accuracy of the CapTel service, arguing that the operators often struggled with jargon or accents, or with the speed of the other party's speech. For respondents who had some residual hearing, this was not as big a problem as it was for those who were totally dependent on the captioning with no way of knowing where errors were.

There were often some language barriers to overcome with jargon and accents

S – grants officer

Captioning sometimes struggled with some accents – but same with TypeTalk.

J – software developer

I could never trust the captions – ever! I would have to confirm 2 or 3 times important information. I had some hearing and knew my job so figured out a lot of stuff but for a totally deaf person it could be very misleading. Whilst it was easier to communicate with the public and colleagues on CapTel, it was terribly stressful...it was inaccurate.

K – garage management officer

- Although several respondents used the Instant Captioning part of the CapTel service for meetings, they noted that there were still problems to be overcome. The meetings had to be

tightly controlled in a very quiet environment to allow the captioner to accurately and clearly hear all participants in the meeting. Without this, the service was not helpful at all.

> I prefer Palantypists, but it is hard to get Palantypists and they are expensive but web Captel was not as good...in a regular meeting, you can adjust for people not speaking clearly, but with web Captel you can't do that...if you are not clear you have rubbish coming up.
>
> ***T – career advisor***

The challenge of communicating at home

Respondents report a lot of frustration with communicating at home to family, friends, or services. Currently the only available service at home is basic text relay, yet only four out of nine use basic text relay at home – and only on occasion – while the rest prefer having a family member or friend make any calls for them.

The latter five stated that although they dislike being dependent on a family member, it is more efficient and easier than trying to use basic text relay. At the same time, their total dependence on others can be very frustrating and is a barrier to the outside world, particularly when they live on their own and do not always have someone around.

> If the telephone has to be used outside of work, I ask my family or friends to make the call – sometimes I text my parents to ask them to do it for me.
>
> ***J – mechanical engineer***

> I am always asking someone else for help. If I am outside and I can't find the friend I'm meeting, I have to ask a stranger to talk to them on my mobile for me. Very embarrassing.
>
> ***K – garage management officer***

> I will avoid the telephone at all costs. If no relative is around to help me the calls will go unmade and that is not acceptable or very fair to myself or the caller. I don't see why at 40 years of age I should be relying on my parents or husband to help me with calls if there is no TypeTalk phone available. This happens often when abroad or in public places. I find this humiliating and soul-destroying
>
> ***S – grants officer***

> I received a call made from an old school friend to talk about 'old times.' He got my phone number from directory enquiries. Unfortunately for me, I had to ask my wife to talk to him, and she relayed the messages to me.
>
> ***A – European quality manager***

All nine respondents are reluctant to use the telephone at all unless forced to, whether they typically use basic text relay or a family member.

I avoid telephone contact as much as possible

J – head of immunisation policy

The uncertainty over whether I will hear easily or not means I tend to avoid voice calls.

J – software developer

I never use the voice telephony service at work or at home, it's too frustrating for both myself and the caller

S – grants officer

This includes speaking to close friends or family on the phone. For those deaf people who are living alone at home, this can be extremely isolating. Many expressed their distress at losing touch with friends or family because they have no means of communicating with them.

Friends won't speak to me on TypeTalk

K – garage management officer

My close family and friends don't like using Type Talk as they want to talk to me and I want to hear them without the interference of an operator, they say that it is not personal feels like there is another person listening in on the call.

S – grants officer

I have no means of chatting with someone on a personal level. Hearing laughs, crying, tone of voice add a lot to a conversation which I don't get with TypeTalk. These factors, and not being able to interrupt, and TypeTalk's slowness, put off people from calling me.

J – software developer

Respondents' distaste for using basic text relay often stems from their dislike of how the service makes them feel. They prefer to feel on equal ground with the other caller.

> Those of us who live predominantly, if not almost completely in the hearing world, may be uneasy with deaf technology beyond hearing aids. I certainly used to avoid most deaf technology apart from hearing aids, and this was a factor in why I never looked into TypeTalk until a few years ago. If you manage for the most part to be like any hearing person, and regard yourself as being like a hearing person, then anything that makes you seem more deaf than you feel you are, can be off-putting.
>
> ***J – software developer***

While SMS, instant messaging, and email provide some filler of this gap and allow communication equivalence between the deaf and hearing person, study participants believe it is not always an adequate replacement for the phone. Most respondents frequently use these services – six of nine use email frequently at home, two of nine use instant messaging frequently at home, and eight of nine use SMS frequently at home – and listed them as integral forms of communication at home.

> There is a reluctance for people to contact me via TypeTalk. They prefer to use SMS.
>
> ***A – European quality manager***

> Where possible, I do everything online
>
> ***J – mechanical engineer***

However, they also explained that there are a number of factors which prevent them from being the most appropriate form of communication at times:

- Misinterpretation of messages and the lack of emotion involved in sending text is a prohibitive factor when communicating about anything complex or lengthy. These forms of communication are not as fluid as a normal voice conversation and as such are restrictive.

> I like to have a good catch up with my friends over the weekend, but I have to use mobile to send SMS messages back and forth as it's not nice discussing personal things on Type Talk when you know that an operator is going to voice over the calls. Although SMS text messages are good, they are also quite isolating as it's nice to be able to hear the person you calling and just to have a normal free flowing conversation for 10 – 20 minutes is nicer than sitting texting back and forth.
>
> ***S – grants officer***

> Although text messages are fine and now considered acceptable, there are occasions that emotions are not correctly interpreted
>
> ***A – European quality manager***

- Another issue with instant messaging in particular is that it is not easily available on the move. Whereas SMS can sometimes be effective for short messages, any lengthy conversation has to wait until the person is back at their home at the computer.

I was out when I got a text from my mum. She asked me to get on MSN Messenger as she urgently needed to discuss something (we use Messenger rather than TypeTalk since it's much more user friendly and conversational). This was a real hassle for me and meant I had to get home quickly which was an inconvenience for me.

J – software developer

However, the most common problem that respondents cited was that of time. Waiting for a response via email or SMS can be problematic when making plans. They would like to be able to make a quick call and solidify plans immediately rather than sending messages back and forth all day.

I could have gone to bed earlier but I had to wait for a reply email re: meeting friends the next day

K – garage management officer

I spent today discussing weekend plans with a friend. We exchanged several SMS today to discuss options, but this is not resolved yet, and I will need to SMS her again tomorrow to finally sort it all out. With CapTel I could have phoned her and spoken about it, and resolved it today. As well as having the pleasure of being able to catch up – more than you can through SMS.

J – mechanical engineer

For those respondents who do use basic text relay to speak to family or friends, the operator can create some additional barriers.

When I used Typetalk before and I phoned my boyfriend and said "I love you" he said later, "That was awful, that was terrible" and I said, "Why?' He said because the Typetalk operator was a man!

T – career advisor

The Typetalk operator often stops the conversation saying their working hours are up, and then we have to wait for a new operator!

P – information manager

Contacting services and businesses for ordering food, booking appointments, or speaking to a service provider can be additional obstacles. Basic text relay is not capable of handling automated voice systems due to the speed of the options listed, and hang up rates are very common.

> With automated calls, too often the options are quite fast, and the TypeTalk operator cannot keep up with relaying these options. Consequently they have to redial.
>
> ***A – European quality manager***

> I made 9 phone calls to Sky and 8 were disconnected. On the 9th the TypeTalk operator told me the person refused to take my call. I ended up emailing which means I have to wait for a response – if I get one?
>
> ***K – garage management officer***

> I used Type Talk to contact bank to make a quick transfer of funds. Again, due to the length of time it took for the operator to connect, they had hung up. I had to redial, the Type Talk service had to be explained and then I was put on hold whilst the person who was taking the call went to see if her manager would allow her to accept this Type Talk call due to confidentiality purposes as a 3rd person involved in the call. Eventually after a lengthy discussion with assistance from the Type Talk operator explaining that Type Talk is an acceptable confidential service, etc the call was allowed to proceed.
>
> ***S – grants officer***

If you had a magic wand…

We asked all respondents to imagine their ideal telecommunications service and its ideal characteristics. Some of the commonly named features were:

- Portability/mobility.
- Not obvious or intrusive equipment.
- Something the “hearing world” can cope with.
- Accuracy and/or the ability to speak to an operator before making a call regarding jargon.
- Automatic and accurate speech recognition software to install on any phone or other mobile device for announcements, movies, or face to face conversations.
- Ease of setup.
- The ability to link mobile phones wirelessly with hearing aids.
- An alternate voicemail option.
- A 24/7, low cost service.

Annex C The needs of deafblind people

The basis of our findings

The findings in this annex are based on a mix of face-to-face and e-mail discussion with four deafblind people with varying visual, vocal and aural abilities. We also:

- Held email discussions with Sense, the main organisation representing deafblind people.
- Reviewed the findings of one of their most relevant reports[52].
- Carried out desk research by visiting a range of relevant websites run by equipment suppliers and stakeholder organisations.

The quotes below refer to respondents by their first initial and job title.

The population of the deafblind

There are several hundred thousand people in the UK with both significant visual and significant hearing impairments. A precise number is difficult to collect as deafblindness is often a hidden disability combined with problems in defining and assessing the condition. It is particularly unclear how many older people have a dual sensory loss. What is clear is that among people over 75, the incidence is much higher than in the rest of the population. Studies show that:

- One in 12 experience some visual loss by the age of 60. This increases to one in six by the age of 75.[53]
- 55% of people over 60 are deaf or hard of hearing.[54]
- 35% of visually impaired people report significant hearing difficulties.[55]
- About 50% of visually impaired people over 80 also have a significant hearing loss.[56]

Some acquire the impairments through age, illness or accident. Others inherit them. There are, for example, around 4,000 people[57] with Usher syndrome. They are typically born partially or profoundly deaf and begin to lose their sight as teenagers or young adults. Three to six per cent of people born deaf have Usher syndrome.

Sense estimates that there are around 23,000 people who are classified as deafblind[58]. This estimate is an order of magnitude less than the estimate of those who have both visual and hearing impairments. We assume that this difference reflects the degree of impairment - with only those suffering from severe visual and hearing impairment included in the 23,000. It is this group whose needs we consider further in this annex.

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[52] *Making Technology Work*, Sense, 2005

[53] Vale D and Smyth C (2003). Changing the way we think about blindness. RNIB.

[54] RNID 2000.

[55] RNID 1991.

[56] RNID 1991.

[57] Sense estimate

[58] *Making Technology Work*, Sense, 2005

The characteristics of deafblind people

The level of visual and hearing impairment among these 23,000 people vary considerably. Some are totally blind but most are not; some are totally deaf but most are not; and some claim BSL as their first language while others have English. Figure C1 illustrates. It tabulates some of the findings of Sense's survey of 326 deafblind people undertaken in 2005. The survey authors note that BSL users are "*well represented among the people who responded to the survey*".

Figure C1: The preferred communications methods of deafblind people

Written communication		Personal communication	
Method	Number	Method	Number
Standard print	47	Spoken English	116
Large print	185	BSL	34
Braille/Moon	34	Deafblind manual	29
Not stated	60	Hands on BSL	26
		Other	42
		Not stated	79
Total	***326***	Total	***326***

Source: Sense survey

Use of telecommunications

Our research produced many findings which are similar to those presented in Annexes A and B. Here we highlight the main findings which are specific to deafblind people:

- The statistics of Figure C1, when combined with the findings of our interviews, suggest that a high proportion of deafblind people would find one or more of the three relay services useful with suitable adaptations.
- There is a very substantial range of hearing and visual impairments within the deafblind group. If this group is to get the most out of a telecommunications relay service, then they should be able to tailor the services to match their requirements. We list some of the main adaptations which are needed below.

there are varying degrees of visual impairment and deafblindness amongst us. The term "deafblind" is quite generalised and diffused

N - author

- Three of the four interviewees find basic text relay useful and use it regularly. They generally view basic text relay more positively than the respondents of Annexes A or B. But they still suggest a number of improvements. In particular there is a general requirement for terminals which offer large text on high contrast backgrounds. The RNID Talk by Text service meets this

requirement well, but the service is not funded by BT and is therefore more expensive per minute than the basic text relay service for a deaf user.

L – charity worker

- Video relay services are extremely useful for BSL users within the deafblind population, but the service would be improved if:
  - Signers wore black tops and signed against a plain background.
  - The quality of the video could be improved - perhaps by use of video frame or video augmentation techniques.
  - Large screen displays (e.g. 32 inch) were available.
- When on a large screen with adjustable font size and colour, captioned telephony can be quite useful for those with poor sight who speak English clearly. It is also helpful for those who are completely blind and who use a Braille device. Any captioned telephony service should, however:
  - Offer users the ability to tailor the text display to suit each user and make it as easy to read as possible.
  - Offer those who are totally blind and use captioned telephony with a Braille reader control over the speed with which the text appears so as to match the Braille reading speed.

R - retired

- Whatever service is provided should be easy to set up. Setting up a computer system is especially challenging for a deafblind person.

Employment

Unemployment rates are especially high among deafblind people. While RNID works suggests unemployment rates of around 20% in the deaf community as a whole, unemployment rates among deafblind people of working age are probably over 60%. According to Sense, for example, the breakdown of occupational status in its recent survey is as shown in Figure C2. This shows that 47 of the 74 deafblind people who are not studying or retired are unemployed[59].

[59] The unemployment rate may be significantly higher than 60%. We do not know how many "retired" people are of working age for example.

Figure C2: Occupational status of deafblind people in the Sense survey

Status	No. In sample	%
Employed	27	8%
Unemployed	47	15%
Studying	36	11%
Retired	183	56%
Not stated	33	10%
Total	326	100%

Source: Sense survey

This high rate of unemployment has a number of causes which include the following:

- Difficulties in using the phone at work contribute, as described in Annexes A and B, to lower employment rates.
- Travelling to and from work is particularly stressful for deafblind people, and this can lead to early retirement.

> Increasingly I work at home, as do many deaf blind people when they can, due to the fact that commuting/travelling can be stressful/very hard work for us
>
> **B – IT professional**

- There is also the additional stress of coping with work which can lead to early retirement.

> it is always very difficult for the [employer] and the deaf blind employee. Like me, many are more than happy being not into employment. That way, I can be able to do many other things in my own time and pace.
>
> **N - author**

- Finally there are, according to one of our interviewees, prospective employees whose attitudes towards deafblind people make it hard for them to find and keep a job.

There is general agreement that teleworking from home would help considerably in making work less stressful by eliminating the journey to and from work, and that the use of captioned telephony and video relay services would make teleworking a much more practical possibility for the deafblind population.

> Travel is a big issue for deafblind people and opportunities for teleworking would be advantageous. I work mostly from home. We have even been doing team meetings over the phone
>
> **L – charity worker**

However one respondent was concerned as to whether employers would find extensive teleworking acceptable.