

Business Telephone Systems

A Buyers Guide



Foreword

Recent years have seen major changes in telecommunications, with the transition from analogue to digital telephone systems, the introduction of wireless communications, computer telephony integration and convergence of voice and data on IP networks.

Aastra is at the forefront of recent developments and the opportunities they bring, but we also understand how confusing they can be for non specialists in small and medium-sized businesses faced with their own set of challenges.

As the functionality of telephone systems has increased, the buying process has inevitably become more involved. It is no longer enough simply to select a telephone system on the basis of how many people you expect to be employing in five years' time. You must also consider how closely you want to integrate the IT and telephone system, how sophisticated a call centre you will require, whether people will work from home or the office and many other questions.

By providing an introduction to the features of modern telephone systems and their benefits, this guide will make the buying process a little easier. It explains current terminology like CTI, Unified Messaging, VoIP and IP Telephony, and examines how technology can be used to improve customer service and the efficiency of internal communications.

Aastra is one of the world's fastest growing telecommunications companies and #1 in the sub 100 extensions for EMEA*. Its recent acquisition of the telecoms divisions of Ericsson, Ascom, EADS and DeTeWe has given the Canadian company a strong presence in Europe and a product portfolio second to none. Whether you are a sole trader or large enterprise; you require a traditional telephone system or the latest IP-based systems, Aastra has a solution to meet your needs.

A telephone system provides the link between a business and its clients, suppliers and potential customers. Selecting a system for the way you work now and the way you may work in the future is one of the most important decisions you are likely to have to take. With its balanced assessment of the benefits and pitfalls of new technologies, such as IP telephony, *Business Telephone Systems: A Buyers Guide* is designed to make your task a little easier. We hope you find it useful.



*Source: © Canalys, unified communications call control managers line shipments, CY 2009

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Executive Summary

- ✦ **Competition in the telecoms industry has never been greater.**
- ✦ **Businesses can make calls using a variety of fixed and mobile devices.**
- ✦ **Calls can be routed over mobile networks, the PSTN, Wi-Fi networks or the internet.**
- ✦ **IP telephony providers are challenging traditional network providers in the consumer and business markets.**
- ✦ **Telephone system providers give businesses the tools needed to exploit the opportunities offered by greater choice.**

In 1876 Alexander Graham Bell invented the telephone and the world suddenly seemed a smaller place. It has been shrinking ever since.

Today, you can pick up a telephone, dial a few digits, or click to dial from your PC, and instantly be connected to someone on the other side of the world. This can be done using a fixed phone, cordless phone, mobile phone, IP phone or even a PC running a softphone. Calls can now be made over landlines, mobile networks, IP networks, the Internet, wireless networks, satellite links and undersea cables, and can include voice, video and data.

For most of the last 130 years the telecommunications infrastructure and equipment used to make calls were provided by state-funded monopolies known as Public Telephone Operators (PTOs).

This all changed in 1984 when the UK telecoms market was liberalised, ushering in a period of competition from other service and telephone system providers.

Today we are on the cusp of an even more momentous revolution, as convergence of voice and data has opened up the telecoms market to competitors with data networking backgrounds. You no longer need a telephone and telephone network to make calls: all that's required is a PC and Broadband connectivity.

Market fragmentation is most pronounced in the consumer market, where the popularity of mobile phones is affecting demand for fixed line connections and reducing the volume of voice traffic carried over the network.

More competition comes from the growing number of internet telephony providers such as Skype offering free or low cost calls over the internet. Originally developed for the consumer market, these services are now being marketed to businesses as call quality and networks improve.

The technology that makes it possible to make calls over the internet, IP (Internet Protocol) signalling, allows voice traffic to be carried over local and wide area data networks, with far-reaching consequences for businesses.

Instead of running separate voice and data networks, businesses can now carry voice and data traffic on one network, with the potential to reduce infrastructure costs; centralise resources for remote workers, homeworkers and branch offices; and tightly integrate the telephone and the PC. Significant improvements in business communications and productivity.

Manufacturers of today's telephone systems have kept pace with these changes and offer a variety of hybrid telephone systems allowing you to choose how best and when to take advantage of new technology.



While IP is clearly the technology of the future, it may not suit every business. For example, if you are planning to route voice traffic over your data network it is important to make sure that your network has the capacity to handle the extra traffic. Not every business will want to make the investment in network infrastructure that this demands.



It is no exaggeration to describe recent changes in the telephony industry as revolutionary. Our aim, with this guide, is to provide you with the knowledge to make an informed decision when acquiring a new phone system for your business. We explain what features to look for and describe how technologies, such as Voice over IP and IP telephony, could benefit your business.

Choosing a Telephone System and Supplier

Executive Summary

- ✦ **The telephone system is a business's main link with the outside world.**
- ✦ **Any telephone system will have to meet medium and long-term needs, as well as current ones.**
- ✦ **Involve different departments and key members of staff in the selection process, especially IT.**
- ✦ **Compile a specification list detailing what you require the telephone system to deliver now and in the future.**
- ✦ **Look for a telephone system that can be upgraded to accommodate new technologies or changing circumstances.**
- ✦ **Buy from resellers who are fully trained and accredited by the system manufacturer.**

The best way for managers to get a true picture of their business or department is simply to phone their own company a number of times and ask to be transferred to key departments and personnel. How the call is handled will reveal more about an organisation than any number of consultants' reports.

The business telephone system, or PBX (Private Branch Exchange) as it is often called, is a company's main link with the outside world and can have a major impact on potential customers' first impressions of a business. If callers or potential customers are met with an engaged signal; if they are put on hold and then forgotten; if they are passed from department to department; if they are sent to voicemail without warning, they may well take their business elsewhere.

The choice of a telephone system and telephone system supplier is one of the most important decisions a company can make. Get it right and you can look forward to improved communications with colleagues and contacts. Get it wrong and you run the risk of alienating existing and potential customers.

Protect your investment

There are many reasons for buying a new phone system: you might be moving into new offices; you may need one for a new regional office; the lease on your existing phone system might have come to an end; or you may simply require the latest technology to facilitate new working practices such as home or mobile working.

Whatever the motivation, it is important to remember that, with an average working life of five to seven years, any phone system will have to meet medium and longterm needs, as well as current ones.

Before choosing a telephone system, it is vital to answer a number of key questions, such as:

- ✦ How many incoming and outgoing lines do you need?
- ✦ How many internal extensions will be required (for staff and meeting rooms etc.)
- ✦ Do you have any branch or regional offices with which you communicate regularly?
- ✦ Are you likely to have any in the future?
- ✦ Do any employees work from home some or all of the time?
- ✦ Does your company have a help desk or small call centre, such as a service desk, order processing, sales etc.?

* If orders are taken over the telephone, could call recording aid dispute resolution or help with staff training?

* Is it important for members of staff to be contacted throughout your business premises at all times? If so, are cordless phones the answer?

* How many mobile telephones do you currently have?

* How are messages distributed internally? Could voicemail/automated attendant improve the way calls and messages are handled?

* Could customer service be improved by integrating your customer database and telephone system to enable immediate access to customer records?

Make sure you involve a number of different departments and key staff in the selection process. Any department that depends on the telephone, such as a telesales operation or service desk, should be consulted. So, too, should the IT department, particularly in organisations where there is likely to be communication between two or more branches and a number of homeworkers.



To ensure that you get the telephone system you need and to provide back-up in case of dispute, it is important to identify the features you can't do without and compile a specification list detailing what you require the system to deliver now and potentially in the future.

In-house or hosted telephony?

Having made this list, you may wish to consider a hosted or managed phone system. A number of service providers now offer Hosted IP or IP Centrex services, which eliminate the need to install PBX hardware or software on your premises.

Instead, calls are handled and managed by the service provider and routed to individual extensions on the customer's premises. As well as reducing the capital expenditure required – the only hardware needed are telephone handsets – these solutions are inherently flexible: lines can be easily added or removed in response to changing needs, and upgrades and new services are regularly added by the service providers themselves. On the downside, running costs are higher and least cost routing options may be limited.

Traditional or IP telephony?

Although hosted IP and IP Centrex services are growing in popularity, the huge majority of businesses will choose to install their own PBX on-site.

Most business telephone systems today are and can route calls over a separate wired telephone network, or IP (Internet Protocol) PBXs which 'sit' on your network as another application, convert voice calls into data packets and route them over local and wide area data networks.

IP telephony is commonplace and has real benefits for certain businesses and in certain applications, such as inter-site communications and teleworking (see page 10 for more details). However, it is not necessarily the best option for all and before going down this route a business will need to take into account considerations such as quality of service, system security, network capacity and the capabilities of the telephone system supplier.

Another option is simply to upgrade an existing system to support Voice over IP, which will allow voice traffic to be routed over data links between sites, providing free inter-site calls and call transfers, centralised call handling and universal numbering plans. This can be a relatively inexpensive solution and a highly effective one for multi-site organisations.

Whatever your chosen telephone system, it is critical that it has a clear migration and cost effective upgrade path to the technologies covered in this guide. Some systems do, many don't.

It is also important to look for a telephone system that offers total flexibility, growth potential and security of investment so that it can be upgraded to meet changing business needs and accommodate new technologies. It should support 'open standards' and have common components and versatile handsets that can be upgraded on an ad hoc basis as new features and system enhancements become available.

Size matters

The size of a telephone system is given in the number of 'ports' that can be supported: buyers can specify a combination of external lines and internal extensions to the maximum total port size. In most commercial organisations it is best to work on a ratio of one exchange line for every 3/4 extensions required.

As ISDN enables callers to dial extensions directly (using DDI – Direct Dialling In) without going through an operator, you do not necessarily need separate lines for voice calls, fax, data and internet access, allowing you to optimise line usage and reduce overall line rentals. This offers the potential of significant cost savings.



Don't just plan for current capacity. If you expect your business to double in size in the next two years, consider what effect this will have on your telephone system requirements. It is often better to wire for additional extensions at the installation stage, even if the extra capacity is not needed for some time.

The right supplier

Word of mouth and personal recommendation are the most popular ways of finding a new telephone system, but bear in mind that your needs may be far more sophisticated than those of the person making the recommendation. Other options are to search for a telephone system on the internet, in trade magazines or at exhibitions. You may also want to seek the advice of a consultant or an existing supplier.

Virtually all telephone system manufacturers sell their equipment through specialised telecoms dealerships and approved resellers. Look for dealerships and resellers that are fully trained and accredited by the system manufacturer. They should offer a complete service, including consultancy, installation, system maintenance and project management and be able to liaise with the network provider (e.g. BT) to ensure a smooth transition to the new system.

Other points to consider

- ✦ Does the reseller's technical competence cover data networking, as well as voice based systems? This is critical if your telephone system is fully or partially IP-enabled or likely to be so in the future.
- ✦ Can the Reseller maintain the system after installation?
- ✦ Is staff training available on your premises and how comprehensive is it and is it included in the price quoted?
- ✦ What leasing or finance terms are available?
- ✦ Is the Reseller a member of a local trade association?
- ✦ What system service and maintenance options are available?
- ✦ Can your system be supported remotely by the maintainer?
- ✦ Has the dealership qualified for any approved standards, such as BSI or ISO?
- ✦ Can your Reseller provide reference sites?
- ✦ As always, look for references from companies with similar requirements to your own.

Executive Summary

- ✦ **Voice over IP and IP Telephony (IPT) are terms used to describe the routing of voice traffic over data networks.**
- ✦ **Internet telephony allows users to reduce call costs by routing calls over the internet rather than the PSTN.**
- ✦ **Multi-site businesses can route internal calls over existing wide area data networks.**
- ✦ **Remote sites and home workers can be fully integrated with a single switchboard and unified extension and numbering.**
- ✦ **IP telephony eliminates the need to install, manage and maintain separate voice and data networks.**

At the most basic level, today's business telephone systems do just what business telephone systems have always done: they allow you to speak to someone anywhere in the world simply by picking up the handset and dialling a number. However, the way that this is done is being revolutionised with far-reaching consequences for the telecoms industry and its customers.

Until recently voice traffic was sent over telephony networks as a continuous stream between two callers, known as circuit-switching, and data was sent over data networks in small chunks, known as packet-switching. The requirement to break traffic down into packets and reassemble them at the other end meant that for many years packet-switching was inappropriate for voice.

This is no longer the case. Developments in networking technology mean that it is now possible to route voice traffic over local and wide area data networks and the internet, without the delays, poor sound quality and garbled speech that characterised the earliest attempts.

The use of the Internet Protocol (IP) signalling standard to do this explains why transmitting telephone calls over data networks is known as Voice over IP (VoIP) or IP telephony (IPT).

Although similar, the two terms tend to be used to describe different applications of the technology: the former refers to the practice of sending voice traffic over a wide area network (WAN) or the internet as an alternative to the PSTN; while the latter encompasses both VoIP and the routing of calls over a local area network within a business.

Both VoIP and IPT offer considerable benefits including improved communication between offices and remote locations/workers, the tight integration of voice and data, simplified network management and cost savings.

All telephone system suppliers now offer pure IP or IP-enabled telephone systems that will enable businesses to take advantage of the three main forms of IP telephony – internet telephony, voice over IP and LAN telephony – now or in the future.

SIP Trunks

The ability to route voice traffic over data networks, bypassing the PSTN, has the potential to transform the way everyone makes and pays for calls.

At its most basic level, VoIP enables Broadband internet subscribers to make free of charge PC-to-PC phone calls using free software such as Skype. The main drawback

of such services is that 'free' calls can only be made to people who have the same software and who are on-line at the same time.

In order to make VoIP calls to conventional telephones and mobile phones, Broadband users must subscribe to an internet telephony service that allows calls to 'break-out' to the PSTN. Such services still offer potential cost savings by bundling free calls with the subscription or by offering reduced call charges.

Initially such services were only of benefit for one-to-one communication. However, growing use of Broadband, the adoption of the Session Initiation Protocol (SIP) signalling standard and the Quality of Service (QoS) guarantees mean that internet telephony services are now being offered to businesses in the form of multi-channel SIP trunks (see page 15 for more details).





Aastra Dialog 7433ip handset

VoIP

Internet telephony is still at an early stage. More established is the use of VoIP to link branch offices and remote workers to the corporate head office.

By IP-enabling existing PBXs at each site, businesses can route voice traffic over wide area data networks linking remote sites and branch offices.

This arrangement has a number of benefits: it saves the cost of using the PSTN to make inter-branch phone calls; and it allows separate sites to be treated as one, with a unified extension and numbering plan, a single point of access for system management, application sharing and a centralised switch-board.

This means that a multi-site organisation can receive all calls at its head office and transfer them to branch offices and all remote extensions such as home-workers through its internal network. Staff can call colleagues at remote sites just by dialling the extension number, and customers only ever need call one number to get through to the right person regardless of where they are located.

Very small offices and home-workers, too, can be fully integrated into an IP enabled telephone system, with the ability to make 'internal calls' free of charge over ADSL Broadband. Because teleworkers connected in this way are treated as just another extension on the PBX with access to full PBX functionality, such as extension status, voicemail and CTI screen-based features, organisations can fully integrate remote workers: all they require is Broadband and an IP PBX extension phone or PC based softphone.

LAN telephony

The third application of VoIP or IP telephony is the routing of voice traffic alongside data over an internal local area network (LAN), which eliminates the need for dedicated telephone cabling within a business.

This has many potential benefits, but as it may require infrastructure changes the earliest adopters have tended to be businesses moving to new offices, especially greenfield sites.



Others have taken advantage of the modular nature of IP-enabled telephone systems to implement IP telephony on a department-by-department basis. Such an approach enables organisations to evaluate the benefits of the technology before implementing it across the whole enterprise. Main benefits include:

- ✧ Cost savings. The ability to route voice and data calls over one converged network instead of two separate voice and data networks should result in lower infrastructure and network management costs;
- ✧ Easier 'adds, moves and changes.' The ongoing costs normally associated with 'adds, moves and changes' on traditional telephone systems may also be reduced as the user has the ability to make configuration updates using software installed on their own PC. Additionally, the physical

task of adding new extensions to the system or moving desk could be as easy as plugging an IP phone into an Ethernet socket on the local area network, thereby reducing the number of cabling ports required;

- ✧ Converged applications. By uniting voice, video and data on a common IP platform, it should become easier to integrate the telephone with PC systems, simplifying the implementation of computer telephony integration and unified messaging applications for example.

Against these potential advantages, businesses will have to weigh the expense of upgrading their existing data network to provide the extra bandwidth, Quality of Service and network resilience needed to carry voice traffic.

Executive Summary

- ✦ ISDN is the de facto standard for business lines.
- ✦ ISDN delivers advanced features, such as DDI, CLI, VPN, call conferencing and call transfer.
- ✦ Also it can be used to optimise exchange line usage by bringing all lines through one system.
- ✦ SIP trunk providers.



Aastra 5380ip

No matter what type of telephone system you choose, you will still need to rent phone lines to carry voice and data traffic to and from your premises.

BT and other network providers offer a choice of analogue or Integrated Services Digital Network (ISDN) phone lines for voice traffic. Both are available on a 'dial up' basis, with charges based on line rental and usage.

While analogue lines may be adequate for small firms with simple requirements, most businesses will be better off with ISDN, which offers a number of advanced services. Among the most useful are Calling Line Identity (CLI) and Direct Dialling Inwards (DDI).

With CLI, the telephone number of the caller is shown on the handset's display as the call comes in. Some PBXs and telephones support alpha-tagging, where the name of the caller is also displayed.

CLI has two main benefits. At the most basic level, it enables you to greet a caller by name when picking up the phone. It is also the enabling technology for a variety of Computer Telephony Integration (CTI) applications, such as screen popping. When a call comes in, the system reads the CLI data and automatically pops up the relevant customer data on your PC screen.

DDI, the ability to assign individual phone numbers to extensions and departments, also has far-reaching benefits. By enabling callers to dial extensions directly, DDI reduces reliance on an operator and ensures that people get through to the right person first time.

DDI lines are one of the great drivers behind the adoption of voice mail as there needs to be some answering system on your extension if calls are coming to it directly. However, calls do not have to go to your voicemail if you are away from your desk, as ISDN enables them to be re-routed automatically to a mobile phone or home office.



Scalable ISDN

ISDN is available in two forms: Basic Rate ISDN (BRI), which is targeted mainly at the home worker or small business requiring up to 8 business lines, and Primary Rate ISDN (PRI), which is suitable for any business using a phone system with eight or more exchange lines.

A Basic Rate (ISDN2e) line includes two 'B' channels, each of which is equivalent to a normal telephone line, enabling two voice calls to be made at the same time. Primary Rate ISDN (ISDN30e) provides up to 30 'B' channels, giving users up to 30 telephone lines.

Broadband

The introduction of Broadband services has replaced ISDN as the fastest method of transferring data between two sites. Increasingly, it is also being used for voice traffic.

For businesses that are IP telephony enabled, Broadband services have become the preferred means of connecting teleworkers and small

branch offices to the company telephone system. If broadband is to be used for voice traffic, businesses should ensure that all remote workers subscribe to the same Internet Service Provider (ISP) and that services are delivered with the right Quality of Service (QoS) levels for voice calls.

Another option is delivered by the growing number of internet telephony service providers that route calls cheaply over the internet. There are no charges for calls between subscribers to the same service or those equipped with SIP enabled equipment. Instead users pay a monthly subscription charge. Originally developed for consumers, internet telephony is popular with business travellers wanting to avoid high hotel call charges.

SIP trunks

Some internet telephony service providers have started offering business telephony services based on SIP trunks as an alternative or supplement to ISDN calls. Essentially multi-channel Broadband connections offering similar functionality to ISDN, SIP trunks

enable businesses to make low cost or free calls over the internet. SIP trunks can be used to communicate with branch offices and customers, with calls being sent across the internet as far as possible before breaking out onto the PSTN.

In addition to lower call charges, such services can give businesses a 'local' or 'international' presence in remote regions as they can be set up with multiple local dialling codes, giving customers the impression that they are calling a local firm rather than one based 100s of miles away, perhaps even in another country.



Computer Telephony Integration

Executive Summary

- ✦ **CTI technology enables linkage with the telephone and computer systems.**
- ✦ **CTI delivers productivity benefits and improved customer service.**
- ✦ **Screen pop-up and on-screen dialling are the most popular CTI applications.**
- ✦ **Enhanced CTI screen-based telephony features include lost call lists, extension status and ACD agent functionality.**

Two of the most important tools in business are the telephone and the computer. It goes without saying, then, that linking the two can deliver significant productivity improvements and customer service benefits.

The process by which this is done is called Computer Telephony Integration (CTI). An interface between the telephone system and server allows data to be exchanged between a computer database and telephone system, instantly giving telephone users the information needed to answer and process calls quickly and effectively.

Such technology has been implemented in large call centres for some time but CTI applications are becoming more common in all office environments as businesses attempt to improve customer service and increase the productivity of staff who handle large volumes of incoming or outgoing calls, such as those employed in help desks, sales teams and technical support.

The classic CTI application is 'screen popping', which uses CLI (Calling Line Identity) to identify callers and display their database records and customer information on-screen before a call is answered, thereby improving the speed with which each call can be handled.

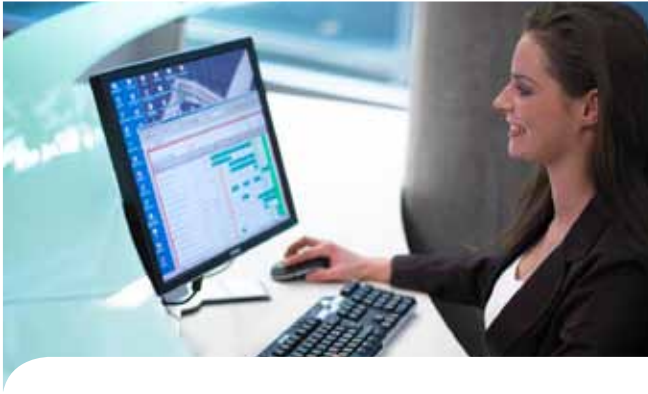
In addition to the customer service benefits of greeting a caller by name, screen popping data from a customer database, for example, gives help desk staff the information needed to deal with an enquiry in one call. Should the caller need to speak to someone else, their details and the updated customer record can be transferred with the call, eliminating the need for callers to answer the same questions all over again.

When potential customers ring back after making initial enquiries, sales staff will have a complete record of the status of their enquiry, enabling them to provide an informed and professional service.

Another useful CTI application is onscreen dialling which lets you make calls by highlighting a customer's telephone number and clicking the call button. Calls can be made by clicking on names in phonebooks; in lists of previous, missed or unanswered calls; or directly from a wide range of popular sales databases and CRM packages.

What's available

CTI applications, such as screen dialling, are sometimes provided as standard with phone systems. Increasingly, manufacturers are bundling their phone systems with specific customer relationship management (CRM) applications, providing a fully integrated CRM solution.



Normally, however, CTI applications must be bought separately. In addition to bespoke applications written specifically for a business, there is a wide variety of commercially available CTI packages on the market.

Basic CTI applications, such as screen popping and screen-based dialling and extension status, are fully scalable to meet the number of users, functionality and automatic call distribution capability required. More sophisticated, call centre oriented applications, such as automatic dialling from a central database, sometimes known as 'predictive dialling', are only available with large scale server based CTI solutions.

Essentially a call centre application, predictive dialling removes all dialling responsibilities from an agent. Once a call has been completed the software automatically dials the next number on an agent's call list, eliminating the risk of misdials and dead time between calls.

Case study

A prestige car dealership has adopted CTI technology to improve the service it offers to customers. The database containing customer service records is now linked to the telephone system so that when a call comes in the customer's name and a full service history of his/her vehicle pops up on the service receptionist's screen. This enables the receptionist to greet the caller by name and display a detailed knowledge of the car's service history. It also allows calls to be dealt with much more quickly and eliminates the need for return calls.



Aastra 2380ip

Executive Summary

- ✦ **Voice processing enhances call handling significantly.**
- ✦ **Voicemail is critical where DDI numbers are used.**
- ✦ **Voicemail offers much more than an answering machine and can provide frequently requested customer information.**
- ✦ **Auto-attendant systems help callers go straight through to the right person or department.**
- ✦ **Interactive Voice Response systems automate many routine transactions.**

Telephone systems have improved greatly in the last 40 years: our ability to take and then deliver accurate messages has not.

Fortunately today's telephone systems can be specified with a variety of voice processing functions designed to compensate for our failings, including voice mail, auto attendant and interactive voice response (IVR).

When used correctly, such systems can greatly improve call handling to the benefit of callers and businesses alike. In particular, they reduce a company's reliance on telephone operators to transfer calls and eliminate much of the message-taking that staff are required to do.

If not used properly they can alienate and irritate callers and lose potential customers, so it is vital to train staff in all aspects of a system.

Voice processing can be broken down into three main areas: voice mail, auto-attendant and IVR.

Voice mail

The most widely used application is voice mail. The use of voice mail has grown dramatically in the last few years, driven in part by the take-up of DDI (see page 14). Because DDI enables callers to dial chosen extensions or departments directly without going through a switchboard, it is important to have some form of answering system in place so that the call can be taken even if the person called is away from his or her desk.

The ability to leave messages in personal mailboxes – even outside office hours – reduces demands on telephone system operators and minimises interruptions to co-workers.

If implemented correctly, voice mail can improve customer service by giving callers the assurance that their message will be heard and by eliminating unanswered, lost or misdirected customer phone calls.

Voice mail, though, is much more than a glorified answering machine. It can take a message when you are on the phone, alert you when you receive an urgent message, send a single message to a group of people and forward a message to a colleague. It is also possible to record different greetings for internal and external calls and for the time of day, including routine customer information such as opening times, voicemail to email etc.

Most systems allow you to pick up all your messages remotely wherever you may be, though it is important for this facility to be password-protected.

Voice mail packages vary in both capacity (the number of voice mailboxes the system can support) and sophistication. Telephone system manufacturers normally offer fully integrated voice mail options for their own telephone systems that are designed to be very easy to use, with extended functionality. A number of specialist companies also offer voice mail packages that are compatible with telephone systems from the major manufacturers.

Most embedded voicemail systems now provide simple unified messaging functionality by sending your messages to your inbox. (see page 20).

Auto Attendant

Auto Attendant systems are designed to direct calls to specific departments or extension numbers without the need for a human operator, helping divert incoming calls from switchboard operators and delivering a more rapid response for inbound callers.

Most systems require callers to press their keypad in response to recorded prompts, such as 'please enter the extension number now' or 'for sales press one; for accounts, press two'.

Some systems direct calls using speech recognition technology, in which case callers are invited to say the name of the person or department they wish to speak to. Outbound calls can be made in the same way.

It should be remembered that some callers are uncomfortable using auto-attendant services, so the option to speak to a human operator should always be made available. To maximise the benefits offered by auto-attendant systems, the implementation must be managed well, as poor planning may lead to adverse reaction from customers and reduce staff morale.



Aastra Dialog 7434ip handset

Interactive Voice Response

Interactive Voice Response (IVR) is used for automation of routine information transactions. For example, IVR can be used for brochure and literature requests or for order taking, where the caller is prompted to leave their contact details and account information. IVR can be used to give out routine information, such as theatre performance start times and seat availability. IVR systems usually offer callers a choice of voice recognition or phone keypad operation.

IVR systems are also available with fax integration. This allows a price list, for example, to be faxed back automatically in response to a customer request.

Unified Messaging

Executive Summary

- ✦ **Unified Messaging (UM) displays voice, fax and email messages in one Inbox.**
- ✦ **Messages can be accessed by telephone, mobile phone, wireless device or notebook PC.**
- ✦ **UM systems can be programmed to automatically forward important messages or messages from certain individuals to a specified device.**
- ✦ **Text-to-speech is technology which allows email messages to be read over the phone.**
- ✦ **Voice-activated messages enable users to save, delete, forward or reply to messages when out of the office.**

The universal use of email, voice-mail, mobile phones and even fax machines means that it is easier than ever to communicate with colleagues and business contacts. Even if someone is unavailable to talk to you, you can leave them a message putting the onus on them to return the call.

Unfortunately, people rarely leave just one message, but instead leave messages on a string of different communication devices. While this does increase the likelihood of a message being received, so called messaging inflation can be a nightmare to manage, requiring users constantly to check separate inboxes on mobile phones, PCs and telephone systems.

As well as being time consuming, juggling between inboxes makes it likely that some messages will be lost or simply not replied to.

Unified Messaging combines voice, fax and e-mail messages in one inbox, such as Microsoft Outlook or Lotus Notes, and makes them accessible via telephone, wireless device, computer or the Internet. Companies that adopt unified messaging can gain a competitive advantage through increased mobility and productivity, better customer service and lower costs.

By effectively being available to manage and receive messages wherever you are, you need never again miss an urgent call or message. When at your PC, it becomes possible to access all messages on the same screen, showing the date, message type, status and sender. If away from your office you can instruct your system to notify you, wherever you are, of specific messages or those from specific senders. All your urgent messages – voice, fax, and

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email – could be forwarded to your mobile phone, for example!

Whilst driving to work or between appointments you can listen to e-mails being read out using text to speech technology. You can manage these messages using prompts that allow you to save, delete, forward or even reply to any message in your inbox with a voice message of your own. Voice activated message management means that all this can be done completely hands free – ideal for when out on the road.

A further benefit, at a time when businesses are under more pressure than ever to keep records of all business communications, is

the ability to create an archive of all messages once they have been dealt with. Should a business ever be required to produce records of email or voicemail messages as part of a legal dispute, a trawl through the UM archive would quickly yield the appropriate files.

Executive Summary

- ✦ **A call centre is defined by the nature of the work, not the size of the operation.**
- ✦ **DDI and alpha-tagging can streamline incoming calls.**
- ✦ **CTI can boost the productivity of call centre agents.**
- ✦ **Virtual call centres give businesses the flexibility to add or remove agents to handle changing call volumes.**
- ✦ **ACD systems manage call traffic to improve call centre efficiency.**
- ✦ **Multimedia ACD systems can be integrated with websites to handle enquiries from on-line customers.**
- ✦ **Call recording can help with dispute resolution and agent training.**

The popular image of a call centre is of thousands of agents with headsets sitting in a vast hangar devoid of any windows. In fact, a call centre can consist of a handful of people and they don't have to share the same office or even be in the same building.

What defines a call centre is not the scale of the operation, but the nature of the work. Any group of people answering or making a large number of similar calls, such as a customer support team, a telesales team, an accounts department or technical support helpdesk, can be classified as a 'call centre'.

Most telephone systems offer a range of automatic call distribution (ACD) and call centre features that provide as much functionality as many companies will ever need. A minority of businesses will have complex call centre applications that may require a specialist call/contact centre solution. In such cases, expert advice should be sought from a specialist reseller.

Telephone systems used in conjunction with ISDN offer a number of features to improve call handling in formal and informal call centres. Simply assigning a DDI number to direct calls to a specific call centre or help desk can help streamline the flow of calls into a business. This can be refined further through the use of

DDI alpha-tagging, a useful feature that enables agents to identify the nature of an enquiry from the number dialled. For example, a sales promotion business running promotions for different companies could use alpha-tagging to identify the specific promotion or advert a caller was responding to. This information could be shown on an agent's PC or phone display, enabling him or her to respond in the appropriate manner. This is often referred to as scripting.

CLI (Calling Line Identity), another ISDN feature, can improve call handling by showing the caller's phone number on agents' screens. If linked to a company directory, database or CRM package, the caller's name and company can also be shown.

Computer Telephony Integration (CTI) is another useful tool, which uses CLI to help productivity in a customer support environment or call centre. In call centres with a high volume of inbound calls, 'screen popping' provides agents with the information needed to answer calls. 'Predictive dialling' can improve productivity in a telesales department where the majority of calls are outbound.

IP telephone systems provide even greater flexibility by enabling users to route calls over Broadband connections to home workers equipped with IP phones or PC-based softphones. This allows administrators to expand 'call centre' capacity to cope with periods of peak demand, ensuring that the same level of customer service is delivered at all times.

Other telephony features of benefit to informal call centres include the ability to view a list of 'missed' calls, which allows staff or agents to phone potential lost customers back and apologise for not having answered their call quickly enough; and simple call routing, which means that returning calls can automatically be routed to the agent who dealt with the original enquiry.

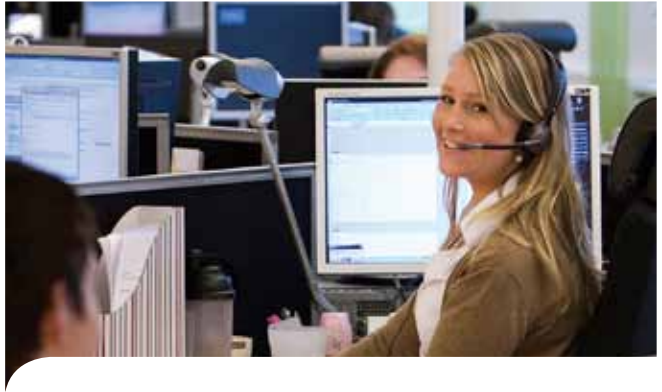
Many telephone systems can offer basic call recording, enabling organisations to keep a record of all telephone-based transactions. This is a legal requirement in some industries, such as financial services, but even where it's not, call recording is useful for dispute resolution or in the training of telesales staff.

Indexing and retrieval of recorded calls is fairly basic on most telephone systems, so businesses with a large volume of incoming calls should look at specialist call recording systems.

Call management

The larger (or busier) a call centre is, the more likely it is to require some form of Automatic Call Distribution (ACD) system to answer and route incoming calls, ensuring that callers are not left with a ringing tone or engaged signal.

Most telephone systems have in-built automatic call distribution functionality or ACD options. For example, if no agent is free to take a call, the system can place the caller on hold and play music or prerecorded information. As soon



as an agent becomes free, the call that has been on hold the longest is put through automatically.

More sophisticated call centres will have in-built ACD packages that can provide such features as dynamic call routing, needs-based call distribution, interactive voice recognition, call management analysis and real-time reporting.

These features allow call centre supervisors to monitor and manage the level of incoming calls and increase or decrease the number of agents accordingly. To motivate agents, real-time statistics showing the number of calls waiting or the longest call queued can be displayed on electronic wallboards.

The latest multimedia systems can be integrated with a business's website, providing on-line customers with the option of communicating with an agent by text or even voice. Call centre back-up has been shown to increase the likelihood of an on-line transaction being completed.

Executive Summary

- ✦ **DECT provides flexibility and can complement fixed desktop phones.**
- ✦ **Voice over Wi-Fi is an emerging technology.**
- ✦ **Both allow users to make, take and transfer calls securely as they move around the business premises.**
- ✦ **Benefits include improved productivity and better customer service.**
- ✦ **With cordless communications it provides new ways of working such as hot desking.**
- ✦ **FMC brings the mobile handset into the telephone system.**



Do any of the following scenarios sound familiar? Your computer system has crashed, and you cannot contact your IT manager; you have missed important calls while away from your desk; you need to check how much of a certain product is in stock but cannot track down the warehouse manager.

For many office workers, particularly those in management or key support roles, simply being in the office is no guarantee that they can be contacted. According to some estimates, office workers now spend as much as 60% of their working day away from their desks.

To ensure that office workers are contactable as they roam around an office, more and more businesses are investing in wireless communications systems such as DECT (Digital Enhanced Cordless Technology), which provides total cordless phone coverage in an office, building, campus or industrial site via a network of strategically placed base stations.

Staff equipped with DECT cordless handsets can then make, take and transfer calls as they roam around an office, ensuring that they are contactable by customers and colleagues at all times. Seamless handover of calls from base station to base station means that the use of DECT phones is transparent to the caller.

Using a DECT cordless handset is no different to using a standard desktop phone. All internal calls are free and there is full access to telephone system features, such as speed dials, call hold & transfer, DDI and CLI.

Many DECT handsets support similar features to mobile phones, making them very easy to use. Additional and optional features include ruggedised handsets for tough and hard wearing environments; headsets for hands-free use; and vibra call for discreet calling.

A DECT cordless handset can be used as a key worker's main telephone. Alternatively, it can be twinned with a desk phone, with calls automatically transferred to the cordless handset as soon as it is removed from the docking unit or charging bay.

Voice over Wi-Fi

Another option for those with IP telephone systems is Voice over Wi-Fi, which allows users with dedicated handsets or softphones running on a notebook PC or PDA to transmit calls over wireless networks. Wireless VoIP systems are more expensive than DECT systems.

Unlike DECT, Wi-Fi networks are primarily used for data, so when installing a wireless VoIP system great care must be taken to ensure that there is enough bandwidth capacity and Quality of Service (QoS) to accommodate both voice and data traffic.



The Benefits

By enabling callers to get through to the person they want first time, DECT and Voice over Wi-Fi systems can significantly improve customer service, help internal communications, maximise productivity and reduce caller frustration.

They can also cut company phone bills, as fewer return calls will need to be made, whilst removing the temptation for workers to use their mobile phones inside the office. According to Deloitte Touche Tomatsu, mobile phones are now used for more than a third of all business calls, even when a potentially cheaper fixed line is available.

Another benefit of wireless systems is their flexibility. Anyone who needs to spend a few days on-site, such as management consultants, auditors or temporary workers can be given their own cordless phone, giving them the use of a telephone without the requirement for additional cabling. Extra system capacity can be added by increasing the number of base stations.

Cordless systems also enable non-territorial working practices. Instead of giving all staff their own desk and corded phone, many companies have adopted desk sharing policies as a way of reducing the amount of office space required. Whilst it is possible to register one's presence at a particular desk by logging onto a fixed phone, it may be simpler to assign a cordless phone and extension number to each member of staff, especially in organisations that encourage staff to make use of breakout areas and team working environments.

Fixed Mobile Convergence

FMC as it is known enables mobile handsets to become part of the telephone system.

It allows the ownership of the mobile to belong to the telephone system by using 'One Number'.

The mobile telephone number is no longer used for business, the user is given a DDI number on the telephone system and all

callers ring this. Calls are therefore directed to the telephone system and from there out to the mobile handset.

In this way all the calls are logged on the telephone system and could be recorded, for instance something impossible to achieve in any other way.

A piece of software is usually loaded onto the mobile to enable its use as an FMC device. This should be a very simple operation requiring no training of the user and no collection of handsets to upgrade.



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Executive Summary

- ✦ **Broadband can be used to connect home workers to the company telephone system.**
- ✦ **IP Telephony enables the centralised management and operation of office-based and remote extensions.**
- ✦ **Centralised numbering plans cover office-based and remote workers.**
- ✦ **Mobile workers can log onto the office telephone system via Wi-Fi links.**
- ✦ **VPNs prevent unauthorised access to corporate networks.**

Home-working should be viewed as a positive answer to traffic, climatic, medical and any other situation where access to the office is restricted or compromised.

The old cliché ‘work is what you do, not where you do it’ has never been truer than it is today. The introduction of notebook PCs, smart phones, mobile phones, data cards and wireless networks means that workers no longer have to visit the office every day: they can work equally well from home, a hotel room, the train or a motorway service station.

In order to do so successfully, mobile and home workers need access to the same resources as office-based colleagues, including the corporate network, so that they have the same information and resources at their fingertips.

But it is not just the needs of the remote worker that need to be taken into account. Equal value should be placed on the needs of colleagues and customers who

have to communicate with remote staff. There is no point adopting a home working policy if it makes it harder to reach key personnel.

The option for businesses using IP telephony is to make or transfer calls to home workers and remote offices over broadband as this will not incur call charges.

Another benefit of IP telephone systems is the centralised management of all office based and remote extensions. This allows organisations to adopt a company-wide extension numbering plan, with unified call management, system programming and voicemail.

Because home offices appear as just another extension on the telephone system – with full system and handset functionality – switchboard operators are able to view the status of all remote extensions and at a glance see who is on or off the phone. Calls can be made or transferred to remote workers in exactly the same way as they would be to office based employees.

This applies to mobile workers too. For example, a travelling salesman equipped with a notebook running a softphone could log onto the company telephone system from a Wi-Fi hotspot and immediately be registered as an IP extension. He could then make, take and transfer calls as easily as office-based colleagues without callers being aware that he was away from the office. This delivers real customer service benefits with the possibility of lower mobile phone bills.

The technology that allows remote users to log on securely is called a Virtual Private Network (VPN). Using broadband as the medium, an IP VPN can help extend the reach of a company network nationally and globally by providing a seamless and secure connection between the remote/home worker and the office. A secure 'tunnel' is set up across the internet giving the home worker access to central files and servers and the company telephone system.

Encompassing a range of wide area network services, IP VPNs are cost-effective because data files are transferred over the public internet, rather than expensive private leased lines, and secure because files are encrypted and firewalls at the desktop and on client devices prevent unauthorised access to the network.

Businesses can order VPNs from Internet Service Providers (ISPs) or create their own using routers. They can be used to link two or more fixed sites, or to provide mobile or home workers with remote access to office systems from anywhere there is an IP connection, such as a Wi-Fi hotspot or Broadband.

The combination of IP Telephony and VPN technology allows organisations to reap the benefits of location independent working, such as reduced travel costs and more efficient use of office space, without losing access to the corporate information needed for fast decision-making and high levels of customer service.



Executive Summary

- ✦ **The transition to converged voice and data networks is changing the way people think about communications.**
- ✦ **Presence technology will show the availability and status of contacts.**
- ✦ **Telephony service providers are converting the UK network infrastructure to IP.**

We are living through a period of huge change in the telecommunications market. Companies that want to reduce their telephone bill or adopt more flexible working practices or integrate PC applications with telephony, the possibilities are endless.

The transition to converged voice and data networks within businesses is already changing the way people think about telecommunications. The days when every new member of staff was given a desk and a wireline telephone are well behind us. Today new workers may be given a desk phone, a wireless phone (DECT or Wi-Fi), a mobile phone or a PC-based 'softphone' and headset.

Some will be given all four, enabling them to be entirely flexible and choose the most appropriate method of communication depending on their environment a DECT phone to carry around the office; a softphone for use with Wi-Fi hotspots; and a mobile phone when 'on the road'.

Now it is possible that office workers will have just one phone incorporating technologies that will enable them to make and take calls inside and outside the office.

The fixed line office phone is already evolving to take advantage of converged voice and data applications, such as onscreen dialling and unified video and data conferencing. Some argue that the desktop phone will disappear completely with all voice applications being driven from the PC screen or converged displays incorporating number pads and telephony function buttons beneath the screen itself.

What no one doubts is that voice and data applications will become more and more tightly integrated with the option to make calls directly from PC-based applications with presence technologies showing the availability and status of contacts (i.e. whether they are in or out of the office, in a meeting or on the phone) and how they can be contacted (video, audio, text or all three).



So where does this leave today's telephone system buyer?

While no one can say with certainty what the telephone of tomorrow will look like or whether we will still be paying call charges in 10 years' time, it is safe to predict that communications in the future will be much richer and full of possibilities for fast moving, forward looking companies.

Whatever your needs are now – and many businesses have only basic requirements – the rapid pace of change in today's telecoms market underlines the importance of choosing a phone system that is flexible enough to adapt to changing needs and sophisticated enough to accommodate technological advances as they occur.



Microsoft

Microsoft is the dominant player in the IT world and many people use MS Outlook as their email solution.

As discussed in Unified Communications the delivery of voicemail into the users mailbox is a simple application provided by most suppliers.

Microsoft has its own solutions for UC and moving ever closer to having its own 'telephone system'.

The latest offering is Microsoft® Lync™ 2010. At present this allows internal communication but requires a telephone system or Gateway to connect to the outside world.

Aastra is also working with MS on its latest offerings and is offering fully integrated Microsoft® Lync™ telephones for direct connections.

Glossary of Terms

ACD/Automated Call Distribution

An automated system for answering, queuing and distributing incoming calls to a number of agents. Popular in call centres, ACD systems also provide statistics, such as the number of calls waiting, average length of call etc., which can be incorporated into historical reports or displayed in real-time broadband on electronic wallboards.

Auto Attendant

An automated answering system that uses prompts to direct callers to the right department or extension e.g. 'For Sales press 1'.

BRI

Basic Rate ISDN2 provides one 'D' channel and 2 'B' channels, each of which is equivalent to a normal telephone line. These can be used for two voice calls; two data calls; one voice call and one data call; or one data call using two channels. As each channel can transmit data at speeds of 64Kbps, this represents a data transfer rate of 128Kbps.

Call Forwarding

A feature of ISDN phone systems, call forwarding enables incoming calls to be diverted automatically to a different number, for example to a mobile phone or home office.

CLI – Calling Line Identity

One of the key ISDN features, CLI displays the phone number of the caller on the answering phone's display. CLI alpha tagging also shows the caller's name and company. CLI is the enabling feature of many computer telephony integration applications.

CTI – Computer Telephony Integration

The term used to describe the linking of the telephone system with a computer or network. The classic CTI application is 'screen popping', which uses CLI to identify the caller and display his/her database records on-screen before the call is answered. CTI also enables calls to be made directly from a contact management package by clicking the call button.

DDI – Direct Dial Inwards

A key ISDN feature is the ability to assign individual phone numbers

(DDI numbers) to extensions and departments, enabling callers to dial them directly without going through the operator.

DECT – Digital Enhanced Cordless Telephony

DECT cordless handsets provide wireless communications within an office or company premises. The handsets can be fully integrated with the company phone system, allowing users to make, take and transfer calls securely as they move around the office.

Internet Service Providers (ISPs)

An Internet service provider maintains a server that is directly connected to the Internet. You must connect through a service provider unless you are directly connected to the Internet.

IP Telephony

The use of IP signalling methods to send voice traffic across a data network. Voice signals are broken down into packets and reassembled at the receiving end. Eliminates the need for separate voice and data networks by converging all traffic on one network.

The convergence of voice and data on a Local Area Network (LAN), eliminating the need for separate voice and data networks within an organisation.

ISDN – Integrated Services Digital Network

ISDN is a 'dial up' digital public network for voice and data communications with charges based on line rental and usage. The de facto standard for business use ISDN provides a number of advanced telephony services, such as CLI and DDI, which form the basis of today's advanced telephony applications. It is available in two forms Basic Rate ISDN2e (2 lines) and Primary Rate ISDN30e (30 lines).

IVR/Interactive Voice Response

IVR systems automate routine transactions, such as literature requests or information lines, using voice recognition or phone keypad operation.

PBX/Private Branch eXchange

A business telephone system.

Predictive dialling

A third party CTI application, predictive dialling removes all 'dialling' responsibilities from an agent. Once a call

has been completed the software automatically dials the next number on the agent's call list.

PRI

Primary Rate ISDN (ISDN30e) provides up to 30 'B' channels, giving users 30 lines that can be used for any combination of voice, data and video.

QoS – Quality of Service

Used to provide acceptable voice quality across IP networks.

SIP

SIP is a signalling protocol used for establishing sessions in an IP network. A session could be a two-way telephone call, a videoconference call or a collaborative multimedia conference.

SIP Trunks

Instead of using analogue or digital (ISDN) lines to connect to a PBX for voice communications, some IP PBX systems can use a SIP-enabled Broadband circuit.

Unified Messaging

Unified Messaging (UM) systems provide one centralised mailbox for all e-mail, voice and fax messages. All message types can be viewed, replied to, saved or deleted in the same Inbox using a familiar message management system such as Microsoft Outlook or Lotus Notes.

Voicemail

Voicemail systems allow callers to leave voice messages in individual mailboxes. Messages can be retrieved remotely.

VoIP – Voice over IP

The transmission of voice traffic over a wide area network or the internet using the IP signalling standard (see IP gateways).

VPN – Virtual Private Network

Organisations with offices in more than one location can link phone systems in a Virtual Private Network. Using a linked numbering plan, a staff member in one location can call a colleague at another office just by entering their extension number.

Wi-Fi – Wireless Fidelity

Wireless local area network: a local area network that uses high frequency radio signals to transmit and receive data over distances of a few hundred feet.

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Aastra Telecom (UK) Ltd is the UK business unit of Aastra Technologies Limited, (TSX: "AAH"), a leading company which is at the forefront of the enterprise communication market. Headquartered in Concord, Ontario, Canada, Aastra develops and delivers innovative communications products and applications for businesses. Aastra's operations are truly global with more than 50 million installed lines around the world and a direct and indirect presence in more than 100 countries. Aastra is entirely dedicated to enterprise communications and offers one of the most complete portfolios of

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For additional information on Aastra, visit our website at <http://www.aastra.com>

Nomis Connections Limited
18 Church Road
Fleet
Hampshire
GU51 3RH

T: 0844 880 9900
email: sales@nomisconnections.co.uk
www.nomisconnections.co.uk

