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Requirements for VoIP Implementation: A Europe-Wide Issue

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A growing number of hospitals are finding it either necessary or desirable to replace their telephone systems. When the opportunity arises, many of them also consider whether adopting voiceover IP technology could be a feasible and useful solution.

Using voiceover IP (VoIP) means voice conversations are no longer routed over the telephone network but over an internal data network or the internet. In the internet protocol (IP) system speech is divided into data packets, before being transmitted over the data network and reassembled in the correct sequence at the call destination.

It is estimated that roughly two-thirds of German hospitals will need to replace their conventional telephone networks in the next five years. Given the international dimension of telecommunications solutions, the figure for other European countries is likely to be broadly similar. The only sensible solution for hospitals is to introduce VoIP with speech and data integration. The problem, however, is that many healthcare providers are completely unprepared for acquiring VoIP and for this reason, hospitals frequently make the wrong call in terms of future viability when choosing a speech and data network.

Starting Point

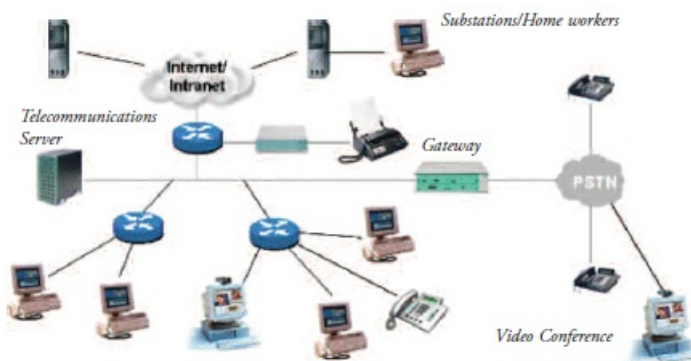
The majority of hospitals still use traditional ISDN telephone systems with analogue and digital connections for telephones, fax machines and so on.

The world of telecommunications is, however, experiencing rapid change:

- A global transition is underway in telephony (from analogue and ISDN to IP telephony)
- We are switching to the "IP world"
- Speech and data are merging in
 - Applications and
 - Networks (shared network for speech and data)
- This has major implications for hospitals.

Why VoIP?

The single network structure used in IP telephony is significantly more flexible and cost-effective than operating two separate networks for speech and data. Moreover, IP telephony solutions are relatively simple to use. Nevertheless, in choosing a system it is vital to consider some crucial factors at the outset. For example, should the hospital make a complete transition to VoIP or opt for a gradual migration to VoIP.



VoIP solutions should accelerate internal and external processes and reduce hidden costs.

The advantages of voiceover IP lie first and foremost in process optimisation

- The use of a single network infrastructure and availability of services and applications;
- More efficient system- and usersupport;
- Cost savings in speech transmission are achieved in the convergent data network as dedicated telephone network lines become obsolete;
- Cost savings are secured as a result of reductions in procurement costs when integrating smaller substations;
- Investments are protected and value is maintained by adopting simple expansion solutions;
- Optimal utilisation of resources and infrastructure;
- Simple integration of new entrants;
- Simple transfer of participants (mobile workplaces); and
- Low infrastructure costs per workplace.

In many cases, the introduction of IP telephony in hospitals delivers much more than simply reduced costs in the areas of maintenance, administration and connection. The focus of many hospitals is on achieving process optimisation and centralised management of IP resources.

Implementation of VoIP

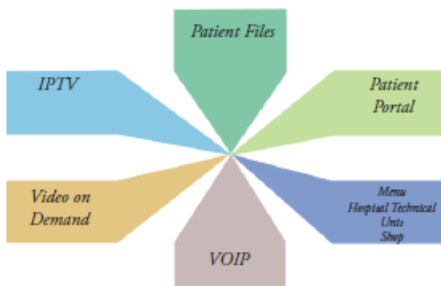
Separate networks, e.g. the hospital's data and telephone networks, are merged in a common data network for speech and data. This delivers the following benefits:

- A single network for voice and data (low investment requirements);
- No additional equipment needed for speech services;
- Interplay of voice and data services on a single end unit;
- Interface for multiple locations via internet/intranet; and
- Free telephone calls over the intranet.

The conventional telephone system in place and the new voiceover IP system are connected via a gateway (migration). Migration of antiquated telephone system and the VoIP

Migration in this context means the integration of old technologies with new technologies. A new technology is implemented making extensive use of existing technologies, structures and resources.

It is still relatively uncommon to install completely new telephone systems. In the normal course of events, the equipment used in a hospital will be replaced or augmented. What strategies can hospitals deploy to perform a migration?



A range of options are available for adopting VoIP:

- Continued use of the old telephone system: ISDN connections are replaced by an IP connection. This option is uncommon in hospitals as it offers minimal potential for reducing costs and IP connections are exposed to substantial risks.
- Systematic replacement: All telephones and units are replaced with IP hardware. A structured cabling system is employed.
- Use of an external service provider: Management of the system is outsourced to an external provider who charges a monthly fee calculated on the basis of the services used and the number of substations.
- Hybrid solutions: The telephone system is expanded using a VoIP gateway. This gradual form of migration benefits from all the advantages of VoIP, offers a backup medium and is relatively cost-effective.

Older telephones are used alongside the new IP telephones.

- Mixed form: Of course, it is open to hospitals to implement elements of all four options.

For example, the existing telephone system can be connected to an IP-enabled network. This option is widely used, notably for substations or external offices which can then be converted to IP at a later date. The existing telephone units can be used until the telephone contract elapses. In tandem with this, a universal VoIP solution can be implemented in other locations. This usually means using IP telephones or soft phones for computers.

Wireless Networks in Hospital

Complementing the VoIP installations in hospitals with IP wireless networks (WLAN = wireless LAN = wireless networks) can be extremely advantageous. These latter systems facilitate the use of voice over WLAN (VoWLAN). VoWLAN is a new trend towards mobile VoIP, that is, mobile voice communication via wireless networks. A new generation of mobile telephone could prove a useful alternative for those who currently use digital portable telephones with VoWLAN while in the hospital and mobile wireless networks (GSM) while outside the hospital.

Over time, dual-use units could replace the DECT handsets currently prevalent in hospitals. Members of staff would only require one mobile handset – presumably a Smartphone med tec with the features available on current PDAs - for two networks.

Patient Solutions with VoIP

Most of the conventional telecommunications systems in use in hospitals have been complemented by communications information systems to facilitate patient access to telephone, television and internet services. This requires the installation of bedside cables for telephone, television and internet connections.

A separate cable is also needed to operate the alert mechanism at the bedside, at least in acute wards. The integration of speech and data services at the bedside would clearly deliver benefits.

One option is to provide a range of IP applications on a single unit.

Security from Start to Finish

In order to guarantee continuous security throughout the system, the route from the virtual telephone socket to the telephone unit must be made secure. A range of security features are available to this end. For instance, the telephone unit must be authenticated on the organisation's network before voice data-transfer can commence.

Conclusion

The merging of speech and data in convergent systems is becoming a top priority for an increasing number of hospitals and other healthcare organisations. IP data networks can now reliably transfer speech data. A series of new applications have the potential to increase productivity. Furthermore, organisations are spared the cost of operating and maintaining two separate networks.

It is hardly surprising then that VoIP has emerged as a leading technology. A range of useful applications protect previous investments and cut costs, while enhancing efficiency and improving customer care. VoIP is, in a nutshell, a technology of the future. The Institute for Hospital Studies (IfK) in Braunschweig, headed by Professor Wolfgang Riedel, has developed a practical guide for hospitals seeking to complete the change over or migration to VoIP. The institute's "road map" sets out the fundamentals involved and details a series of practical examples of the solutions provided by the technology of the future. The guide can be downloaded from the IfK website at www.ifk-Braunschweig.de.

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