

Wireless and Mobile Communications

Andrew Lumley, October 2007

Introduction

I work as an Information Systems Analyst for PWS Distributors Ltd – a family owned business, which is a subsidiary of the Danesmoor group.

PWS are based in Newton Aycliffe and are a trade distributor of kitchen components to the kitchen industry. The company offers around 6500 product lines, employs 200 people and has an annual turnover of 60 million pounds. The site in Aycliffe accommodates finance, sales, marketing, IT and warehousing, as well as a unit which specialises in the manufacture of timber worktops. An additional site, based in Hereford, specialises in the manufacture of granite worktops.

PWS strongly believes that staff should be empowered with information (at the right time) and left to concentrate on their core duties without being slowed down by unnecessary bureaucracy and administration. PWS also believes in continually extending its services to customers. Constant developments in computer systems and initiatives such as electronic workflow management are seen as a means to these ends. As a result careful and practical attention is given to the choice of technology and there is a tendency to develop systems in house (using Omnis 4GL).

The growth of wireless technology

Wireless technology (or mobile computing) is now generally recognised as an important, growing and productive part of the information infrastructure of modern enterprises. So much so, we have become very mobile in our thinking.

This technology has grown from the earlier proprietary systems used in warehousing and manufacturing in the 1980s to portable computing in the 1990s and, through improved connectivity and open standards, now gives genuine untethered freedom to perform tasks away from the desk.

With innovation and freedom however comes risk. Around four-fifths of new and critical data is claimed to be stored on mobile devices. These devices are walking treasure troves and there are people genuinely interested in stealing the content. It is important to acknowledge these dangers and not become complacent in the belief that we are impenetrable.

Where do PWS use mobile technology?

There are plenty of opportunities to use mobile technology and, with newer variations, opportunity to enhance further. As always priorities have to be taken into account. Mobile systems are currently used in warehousing, by salesman and for remote access (eg. Tele-workers). Importantly, these systems continue to deliver core requirements.

How is technology used throughout the warehouse?

There are currently 40 robust radio hand terminals used throughout the picking and goods inward areas (covering 10,000 square meters) – some of which are fixed to trucks. Each gun is connected to one of three aerials and communicates via a propriety system operating a narrowband radio single at 433MHz. Typically this enables a signal to penetrate objects and travel to a distance of 200 meters with a data transmission rate of 9600bps.

Although robust and reliable the maintenance costs for this proprietary system will grow and there is increasing acceptance that system customisation will be required in future.

How has technology moved on?

The most important advance has been open standards. For a developer this enables you to concentrate on business-logic rather than the finer points of writing software to handle the underlining network protocols.

Choice of connectivity has extended to include 802.11a/bg and GSM/GPRS. Both support the TCP/IP network protocol and so more easily tie in with an existing network infrastructure, which could include a remote warehouse connecting via the internet. Note, however, that 802.11 at 2.4GHz do not travel well compared with narrowband and greater care is required in the choice and position of receivers.

For security the 802.11i standard enables data encryption (over the air waves) and authentication to the existing TCP/IP network. An additional layer of security can also be added in the form of VPN and SSL, although this can affect performance.

It is possible to source “ruggedised” PDAs running WindowsCE or LinuxOS, providing access to a range of established applications and development tools. These in turn offer connectivity and support for additional peripherals such as image scanners, RFID scanners and voice recognition, which are bedded into the unit – not to mention a GUI interface, which could offer additional services.

Two further important advantages to the use of popular open standards are it does not require uniquely specialist skills to support or difficulty in acquiring equipment. These ultimately help extend the life of the system and lower the total cost of ownership.

An interesting innovation, which was probably in some way aided by the “open movement”, is wearable computing, enabling picking to be conducted by a headset and voice commands (which could in turn be connected wirelessly to the device by Bluetooth). This rethinks the traditional way in which computing is used.

How is technology used by Salesman?

There are 13 salesmen covering the UK; each is allocated a territory and a robust 14” Toshiba laptop to use on the move or connected to the network from home via VPN. The laptop enables the salesman to view sales information and view/ raise reports, which are then fed into the head office electronic workflow system during synchronisation.

Each laptop runs a cut down version of the head office system. This enables salesman to be productive when offline. However, this comes at a cost: it holds valuable information; is difficult to upgrade remotely; and a cutting down on synchronisation time means relevant data could be left out. Fortunately fast, available and affordable connectivity now enables the system to be hosted at head office and run remotely using either: a remote database link; terminal service link; or a completely redesigned web based system, capable of scaling to any device. These solutions in themselves are not perfect. Connectivity needs to be reliable and web based systems, even at today's standards, are limited compared to their desktop counterparts.

In addition laptops can be a nuisance to carry around; indeed some salesmen choose to leave them at home. Often PDAs are touted as the answer, but limited screen space and an adequate input device for entering lengthy reports can be stumbling blocks. Alternatively, much smaller versions of laptops running Vista are now making there way to the market, with a wide range of connectivity options built in.

How can technology be utilised to benefit the customer/ supply chain?

A fifth of company turnover is generated by eCommerce, but this in not its only aim. Apart from reducing overheads, it is particularly important that eCommerce empowers customers with information about products, their account and order status. A web based interface is only one way of achieving this. Other methods include: making available SOAP/API to enable customers to connect their systems direct; alerts via SMS and information services by mobile; and desktop widgets to enquire on the status of orders and stock and raise enquiries.

Also under consideration is the supply chain. A system running on mobile devices could be provided to suppliers to help streamline the process of shipping and booking in stock.

Conclusion

There have been a number of interesting shifts in technology over the last few years. Uprooting all current systems to fit however would be a considerable undertaking and you would have to ask if and where there is a material benefit – particularly when current systems continue to fulfil their job. If, however, you are ever working towards an upgrade you might as well be sailing in the right direction.

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