

## INTO THE UNKNOWN

*Mobile technology in the supply chain can provide business advantage but it can also be a minefield. John Hookham (below) looks at some of the key issues. Part one of a two-part feature.*



For many service management companies and plant maintenance departments, the provision of handheld devices to mobile workers is seen as a cost-effective way of increasing their productivity and efficiency while improving overall service levels and meeting SLAs (service level agreements). The message is simple: you can use mobile technology to add to the bottom line by improving workflow and shortening the data feedback time.

But for most organisations, mobile technology is an unknown entity. The IT department has often grown up with propriety hardware and software but has made the transition to standards-based client/server or web-based enterprise applications. Connecting remote workers to central systems (other than via email) is new and different, and in many cases the IT department is not even clear on the questions to ask. In fact, there are two fundamental questions:

● What is being replaced? Most organisations do not fully address this issue. In reality they will be replacing an easy-to-use, cost-effective solution that can be rapidly deployed with a user-friendly interface. This existing solution can have pre-defined 'pick-lists', signature capture and has ample room for comments and feedback; it is always available and is lightweight and portable. The solution has been around for many years and is quite simply – paper...and if your new 'electronic' paper system is not as easy to use as the old established 'analogue' paper system, then the implementation will fail.

● What is a mobile worker? Clearly the 'man-in-a-van' and the traditional service engineers who travel to various customer sites to maintain buildings and specialist machinery are mobile. But mobile workers also exist in factories and production plants. They may be working quite a distance from the nearest computer screen but they still need access to up-to-date information. Mobile devices will allow them to access technical information, spare parts lists, etc, and enable them to enter feedback data at source rather than using paper as an intermediary, before the data is entered into the IT systems. So any non-workshop based engineers can be considered as mobile workers whose efficiency can be improved by equipping them with 'electronic' paper connected to the central systems.

### Choosing a mobile solution

There are five fundamental components that comprise a mobile solution:

1. Hardware for the engineers (client).
2. Client-side application.
3. Communications and synchronisation.
4. Server-side integration.
5. Security.

#### 1. Hardware for the engineers (client).

There are two main types of mobile hardware suppliers: the specialists such as Intermec, Symbol, Itronix, DAP, etc, who tend to provide more rugged kit; and consumer suppliers such as HP, Palm and Dell – although some suppliers (such as Panasonic) have also produced rugged versions of their laptops known as ToughBooks.

The visible screen and user interface are important aspects of hardware selection; and screen size (ie, resolution rather than the physical size) varies depending on the type of device. A laptop can be considered full size and for data input will have a full 'QWERTY' keyboard. Some devices, notably many Windows CE computers, have half-size screens, with a wide screen (as per the laptop) but with half the screen height, and these devices normally also have a full (but dinky) keyboard.

Most PDAs (personal digital assistants) have a quarter-size screen and have a pen or pointer as the user interface rather than a keyboard, although some have numeric pads to help with data entry. If a mobile phone is going to be used as the client device, the screen size will be even smaller than that of a PDA. Generally, the larger the screen resolution, the easier the client application will be to use, as there is less use of scroll bars to see all of the relevant information.

There is no single right answer when choosing the hardware; it will depend on the engineer's requirements and the client-side application. But whichever device you choose, the availability and specification (both hardware and software) from the supplier will change as your solution is deployed, and this needs to be built into the project plan. For example, the new version of the hardware may only support the latest version of the Palm or Windows CE operating system rather than the older version that has been deployed and so changes may need to be made to the client-side application.

A crucial and often ignored aspect when selecting mobile hardware is battery life. Devices that operate with a constant connection to either an internal wireless network or to GPRS are power-hungry and a single battery may not last for the working day, forcing the engineer back to using good old-fashioned paper – with understandable, if not exactly welcome, comments as to the usability of the new technology.

If you need intrinsically safe hardware, to attach barcode readers or to be able to print out hard copies of work done for customers, then the options available are more limited.

## **2. Client-side application.**

When a commercially available enterprise package/core system is being used to manage the facilities management or plant maintenance function, there will be three main options to consider when choosing a solution. (These options are also closely linked to two other mobile components – namely communication and synchronisation, and server-side integration.)

As a first option, the core system provider – ie, ServicePower, FSI, Geac, etc for facilities management, or Datastream, MRO Software, SAP, Indus for plant maintenance – will have their own mobile solution. In most cases this will be a third-party partner product, as the development of mobile technology solutions requires a different skillset to that needed for developing enterprise applications.

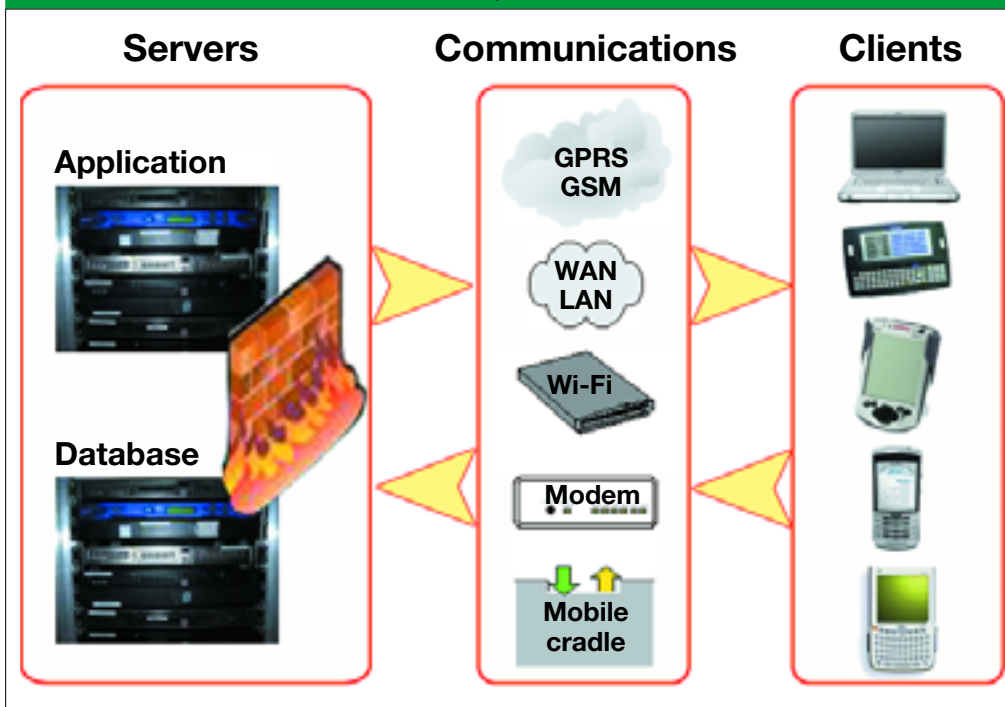
The main advantages of using the 'official' partner products are threefold: consistency in the development of the mobile client functionality with that of the core system; integration with the server-side application; and a clearly defined upgrade path. On the downside, there may be a price premium to pay, with pre-defined communication and synchronisation options and a limited choice of hardware for the engineers.

A second option could be to use products from a third party that work with the core system, but where there is no formal business relationship between the two suppliers – in fact there may even be open competition between the two. There may be significant cost savings as well as a more flexible approach to supporting a wider range of hardware. And there could even be a more functionally rich client-side set of applications, though there will inevitably be issues around software licensing (especially writing data into the core systems database), integration and support.

The third option is to develop a bespoke solution, which ensures that the client-side application will exactly meet the end-user requirements in terms of functionality and choice of hardware. However it is unlikely that the client-side application can be defined in precise detail from the outset and the requirements list will tend to include lots of 'nice-to-haves' that do not provide real business benefits.

For example, the ability to download maps and video may be nice-to-have (and for some users these will be an absolute 'must-have') but for most organisations the cost of providing these types of functions will far outweigh the business benefit. An approach that has been adopted by many organisations is to use the services of a mobile data services company who will not only host the solution but can also provide useful input in designing the client-side application.

FIGURE 1: Mobile hardware and communications options available



### 3. Communications and synchronisation.

Before looking at the various communication and synchronisation options, it is important to establish if the client-side application needs to be able to operate in a disconnected mode or can only operate via a permanent real-time connection to the core system.

If the engineer can operate in a disconnected mode (ie, update as and when required), it may be appropriate to use a docking cradle to upload data at the end of a shift. However a storeman carrying out a stock check could utilise the company's wireless LAN to immediately order parts that are at or below the re-order point. Figure 1 summarises the various hardware and communication options available.

In many situations it is not possible to guarantee a permanent connection and for the engineer to use it, the system application code and data will need to reside on the client device. Data will be uploaded to the server when a connection is established/re-established using either 'push' or 'pull' technology, or in some cases both 'push and pull' technology.

With push technology, the updating process is initiated automatically (ie, without the engineer's intervention); with pull technology the engineer will need to start the process, which is often accomplished by the engineer pressing an update button. The client device will send a message (often an SMS message) to the central server, which then starts the data interchange.

Other mobile solutions use transaction-based technologies – using forms and tag-based languages where the software is server-based, rather than storing compiled application code on the client device. In this scenario, each field is validated as it is entered and requires a real-time connection to the central server.

Yet even these solutions can often operate in a limited way without the real-time connection. For example, repair codes will be stored and can be validated on the client device. This enables work details to be entered even when there is no connection.

Companies offering these types of technology claim their forms-based rapid application development (RAD) tools provide a robust, flexible, low-cost option tailored to the organisation's needs, which can be easily customised and enhanced to include additional functionality.

Where mobile devices are being used for business-critical applications, a real-time connection may be paramount. Today GPRS is widely available, resilient and reliable, but outages can still occur – so it may be worth considering using a service provider who will offer an automatic switch to GSM in the event of a GPRS system failure. This belt-and-braces approach will, however, have cost implications. Typically, the most cost-effective approach, if this type of solution is required, is to use a managed service provider such as Cognito, TBS Mobility, Idesta or Antenna Software.

The second part of this two-part feature will address security and server-side integration, whether there is any benefit in running a pilot project, ongoing deployment issues and the hard and soft business benefits.

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