Field Service Automation

Evolution of requirements and options

Dale Vile, Freeform Dynamics Ltd, July 2007

The use of mobile technology, to help optimise field service management and operations is nothing new, but how successful have past deployments been in this space, and are there lessons to be learned for those looking to invest in either new or replacement systems?

KEY FINDINGS

Mobile technology is confirmed to enhance service flexibility and field resource utilisation

When 100 senior managers were interviewed on their experiences and plans in relation to field service automation, the impact of mobile technology on flexibility and resource utilisation was very clear. Those employing mobile devices in the field, whether wireless or (more commonly) unconnected, are significantly more satisfied on average with their performance in these areas.

Yet mobile investments are not always delivering adequately

The evidence suggests that a significant number of the solutions out there at the moment are not delivering as they should. In fact, a relatively small proportion of those interviewed (about 1 in 10) have a system in place that they are completely happy with. Almost twice as many say what they have today either needs replacing or is in the process of being replaced, with another large group highlighting the need for extensions and enhancements.

Some are already on the second turn of the adoption, enhancement and evolution cycle

While many still think of mobility as a relatively new area, the finding that a significant number of organisations are already looking to replace their first generation investments means the concept of legacy is already emerging in this area. This is perhaps an indication of both changing requirements as early adopters have gained experience, but is also consistent with a maturing of offerings on the supplier side of the equation, providing many more options and greater capability today than was available, say, 5 years ago.

There is question of build versus buy, and the answer depends on the nature of the operation

As we look ahead to fulfilling future requirements, there is a strong correlation between the nature of the field service operation and the style of solution and implementation approach that is considered to be most appropriate. Those with relatively simple and static requirements are more inclined to be looking at packaged or hosted solutions, while organisations with more complex or dynamic requirements favour the open platform approach as the foundation for more tailored applications.

Whatever the approach, wireless is a key requirement, as is multi-device support

Most of the technology used in the field has historically been unconnected, but the general view today is that wireless is a key requirement for future developments in order to drive flexibility and resource utilisation to the next level. Beyond this, those with past experience highlight the need for solutions to be device independent in order to deal with the rate of technology evolution in this space.

The information upon which this report is based was gathered via telephone interviews from 100 UK based senior managers with responsibility for or heavy involvement in the management of field service operations. Responses were split approximately 40/60 between Tier 1 (greater than 10,000 employees) and Tier 2 (between 500 and 10,000 employees) organisations respectively. The sample was made up of a good cross-section of relevant industries.

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Introduction

The use of mobile technology to help optimise field service management and operations is nothing new. Over the past 5 years in particular, many organisations have been deploying handheld devices to the field and implementing the necessary software to drive and manage them, with the obvious objective of streamlining the dissemination and capture of job related information and transactions. This is an area, however, that is far from mature, especially with regard to enabling technologies and ideas of how best to use them, which have both been evolving very rapidly.
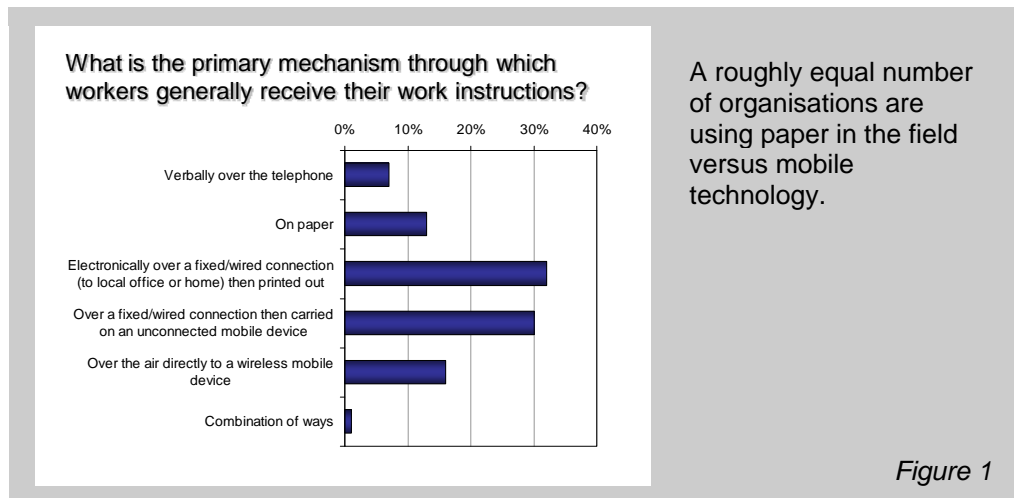
With this in mind, the research presented in this short report looks at the activities and level of success achieved by organisations that have invested in mobile field service solutions in the past, and particularly how experiences are providing lessons that may help in the optimisation of future developments and investments. Along the way, we highlight the factors that are steering organisations in one direction or another, towards or away from the various types of solution available in the market today.

Methodology

The information upon which this report is based was gathered via telephone interviews from 100 UK based senior managers with responsibility for or heavy involvement in the management of field service operations. Responses were split approximately 40/60 between Tier 1 (greater than 10,000 employees) and Tier 2 (between 500 and 10,000 employees) organisations respectively. The sample was made up of a good cross-section of relevant industries and is described more fully in Appendix A.

The current state of play

Perhaps a good place to start the discussion is to look at the way in which communication with the field takes place today. This is something we explored during the research and the findings suggest that there is a roughly equal split between those using mobile technology (either wireless or unconnected) and those still relying on paper (Figure 1).

What is the primary mechanism through which workers generally receive their work instructions?

- Verbally over the telephone
- On paper
- Electronically over a fixed/wired connection (to local office or home) then printed out
- Over a fixed/wired connection then carried on an unconnected mobile device
- Over the air directly to a wireless mobile device
- Combination of ways

A roughly equal number of organisations are using paper in the field versus mobile technology.
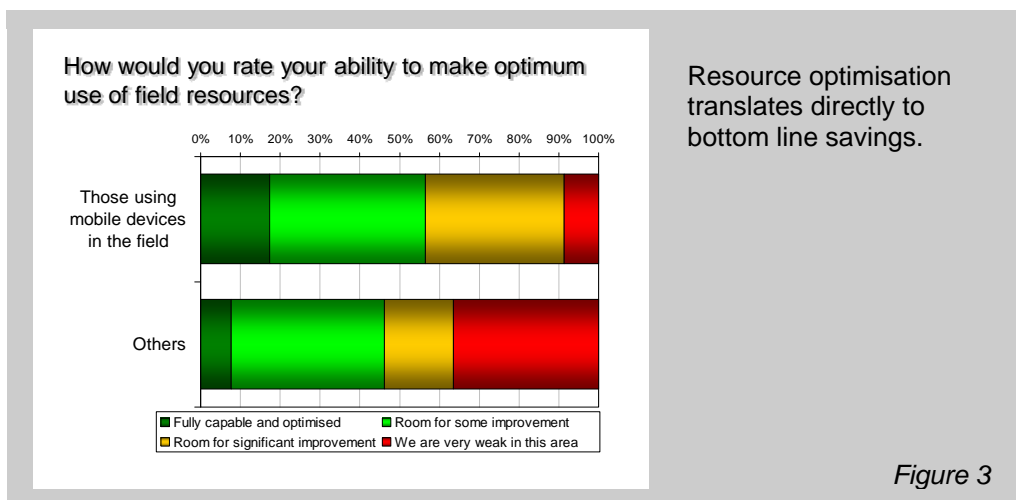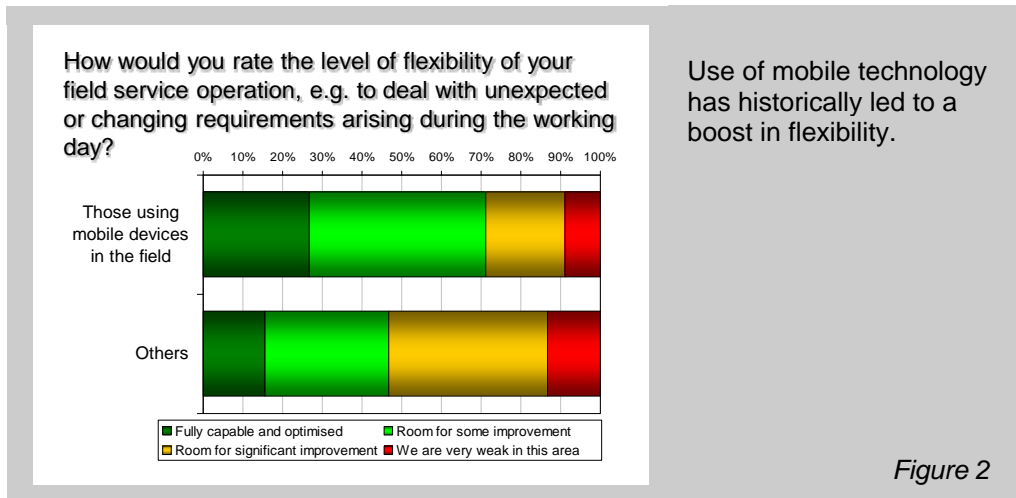
Figure 1

The obvious question when looking at a picture like this is whether the method of communication makes any difference. In order to address this, it is worth briefly reviewing the benefits that organisations are typically looking for when investing in this area.

The business case for deploying mobile technology in a field service context has always been very strong. Benefits to do with reduced administration and increased accuracy of information through the elimination of paper alone have often been enough to justify the cost of hardware, software and associated services. Indeed, reports of 6-12 month return on investment (ROI) periods are not uncommon, purely on this basis.

Beyond this, increased visibility of what's going on the field, coupled with the streamlining of information flow in general can also lead to significant improvements in not just flexibility and

responsiveness, but resource utilisation, and the impact here is evident when we look at the strong correlation between performance in these areas and the use or otherwise of mobile technology (Figures 2 and 3).

How would you rate the level of flexibility of your field service operation, e.g. to deal with unexpected or changing requirements arising during the working day?

Use of mobile technology has historically led to a boost in flexibility.

Figure 2

How would you rate your ability to make optimum use of field resources?

Resource optimisation translates directly to bottom line savings.

Figure 3

It is interesting here to see that those still relying on paper or verbal communications are three or four times more likely to be declaring a weakness with regard to resource optimisation, which clearly has a direct impact on cost efficiency and the bottom line.

However, on looking at these findings, cynics might argue that while there are significant differences between mobile users and non-users at a group level, there are still quite a few organisations that have invested in mobile technology, but still seem to be struggling in these important areas.

So what's going on here?

Well clearly it's not just a case of implementing mobile technology. It must be the right kind of solution implemented in the right kind of manner, operating within the appropriate process and policy framework. This in turn translates to a need to be clear on what you are trying to achieve and an understanding of the characteristics of your environment that have a bearing on how best to move forward, which is something we shall be discussing a little later. Only then can we make an objective determination of the kind of field service automation approach that is likely to be most effective.

When stated in this simple manner, it all sounds very obvious, but the evidence suggests that a significant number of the solutions out there at the moment are not delivering as they should. In fact, a relatively small proportion of those interviewed (about 1 in 10) have a system in place that they are completely happy with. Almost twice as many say that what they have today either needs replacing or

is in the process of being replaced, with another large group highlighting the need for extensions and enhancements (Figure 4).
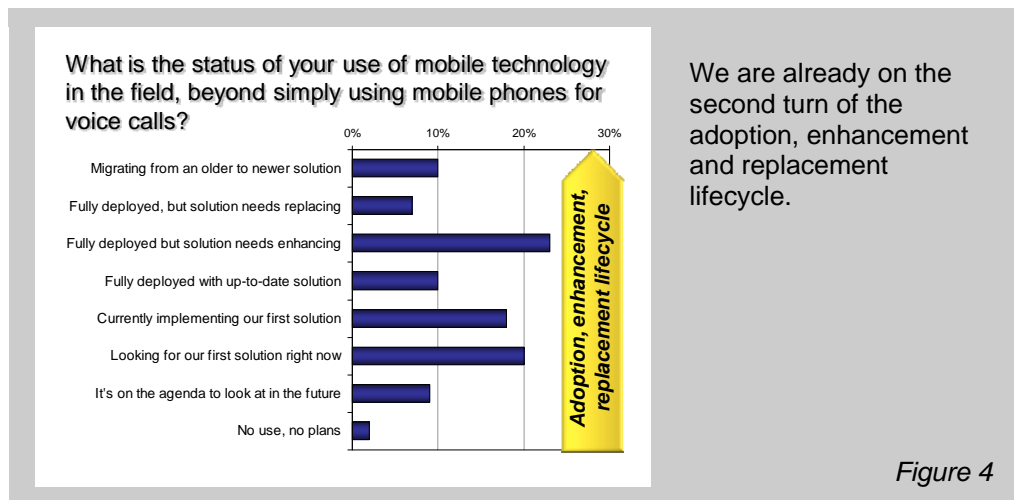

What is the status of your use of mobile technology in the field, beyond simply using mobile phones for voice calls?

We are already on the second turn of the adoption, enhancement and replacement lifecycle.

Figure 4

To be fair, many of the installed solutions marked for replacement are probably not being retired because poor decisions were made in the past, it is simply that when early adopters began to move in this space, the technology available was far less capable, mature and flexible than it is today, and the knowledge of what is and isn't important was limited. This is typical of many relatively new but rapidly developing technology areas, with those gaining benefit from "first mover advantage" by implementing first generation solutions often finding themselves left behind as the market matures and products, services and best practices evolve. As a result, while some may be surprised to see the emergence of legacy applications already in such a young market, this is perfectly understandable given the history.

If we look at the above results in another way, we can see the adoption, enhancement and replacement lifecycle in action, and the fact that while some are already entering the second turn of the cycle, a significant number are only just entering their first turn, or planning to do so.

There are also two observations that are particularly important at a higher level - firstly that only a tiny minority (2% of the sample) view mobile technology as unimportant, and secondly that the majority of the rest are actively looking to drive improvements through better technology in one way or another, whether it be implementing a solution for the first time, enhancing or extending a solution currently in place, or replacing an older solution as we have discussed.

Options for moving forward

The above findings illustrate how "hot" the topic of mobile solutions is within the service management arena as a performance enhancer, but also highlight the number of investment decisions that are likely to be made in the coming couple of years.

It is not surprising, then, that mobile solution and service providers are responding with a plethora of different offerings as they all see the commercial opportunity to help organisations move forward with their field automation improvement initiatives. As the supplier side of the equation has developed, however, solutions have largely fallen into two main groups as follows:

- Mobile application/middleware platforms with associated development tools allowing customised solutions to be built, deployed and managed.

- Mobile access packages or hosted services with predefined functionality, typically designed to mobile-enable enterprise application systems such as ERP or CRM.
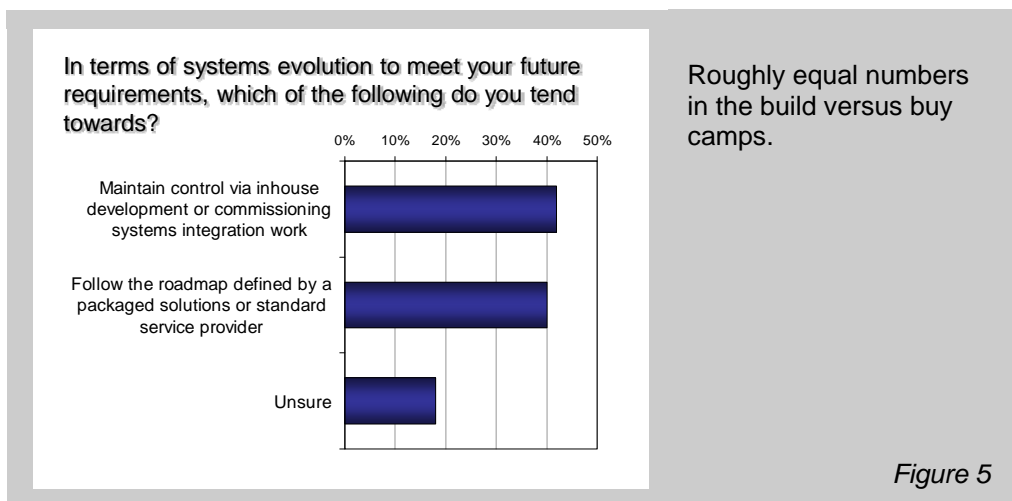
The first of these options is founded on the notion of crafting a solution from a series of building blocks to meet the specific customer need. By contrast, the second option is based on the premise that a supplier will provide a prebuilt solution that comes out of the box solving most if not all of the customer's needs. The classic question of "build versus buy" clearly applies here, but how does an organisation choose between them?
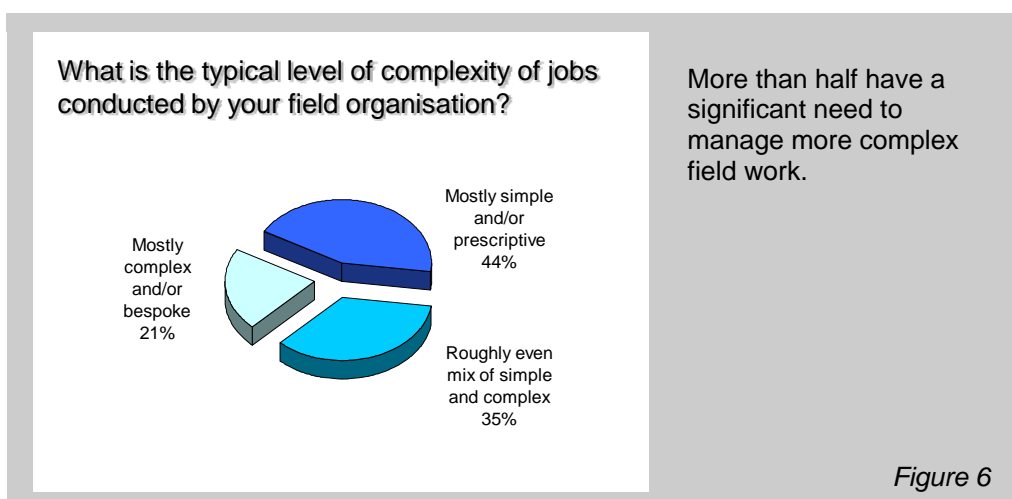
Drivers for build versus buy options

For some organisations, the question of build versus buy quickly translates to a cultural, philosophical, or policy oriented discussion. Some will always look for a package in the first instance before considering a custom development, on the basis that most processes and operations within the average business are fundamentally very similar to the equivalent in other organisations within the same industry sector. Furthermore, the arguments are also frequently heard that predefined functionality within packages is often representative of best practice, and that software vendors are typically better placed to maintain solutions in line with roadmaps designed to keep pace with both industry and technology changes.

In the other camp, there are those that argue that packaged solutions are generally too constraining and stifle business differentiation. In some organisations, the culture of building rather than buying solutions, particularly in key areas of the business responsible for competitive edge, predominates. The philosophy here is one of keeping control and avoiding dependency on a third party for setting the pace and manner of systems evolution, which may not always be fully aligned with the requirements of the business.
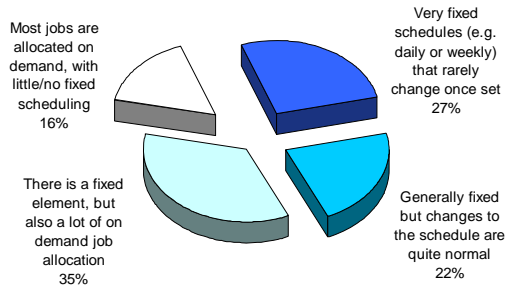
Of course in practice, it is impossible to generalise on this question of build versus buy, it really depends on the area, objectives, starting point and environment as previously discussed, and even if we home in on field service automation, we see a big split in opinion (Figure 5).

In terms of systems evolution to meet your future requirements, which of the following do you tend towards?

- Maintain control via inhouse development or commissioning systems integration work
- Follow the roadmap defined by a packaged solutions or standard service provider
- Unsure

Roughly equal numbers in the build versus buy camps.

Figure 5

During the research, we asked respondents to give us a view of a couple of important characteristics associated with the way they execute in the field, namely the complexity of the work carried out, and the degree to which dynamic or "on demand" scheduling is a requirement (Figures 6 and 7).

What is the typical level of complexity of jobs conducted by your field organisation?

- Mostly simple and/or prescriptive 44%
- Mostly complex and/or bespoke 21%
- Roughly even mix of simple and complex 35%

More than half have a significant need to manage more complex field work.

Figure 6

How fixed or dynamic is your work scheduling process?

- Most jobs are allocated on demand, with little/no fixed scheduling **16%**
- Very fixed schedules (e.g. daily or weekly) that rarely change once set **27%**
- There is a fixed element, but also a lot of on demand job allocation **35%**
- Generally fixed but changes to the schedule are quite normal **22%**

Over half have a significant need for on demand or dynamic scheduling requirements.

Figure 7

Looking at how views of the topic of build versus buy vary by the nature of the field operation then provides us with some interesting insights into how we might choose between these two approaches. It would appear, for example, that those with either a significant requirement to handle complex jobs, or a need to deal with a significant amount of dynamic scheduling are much more likely to favour the approach of building or commissioning custom applications (Figures 8 and 9).
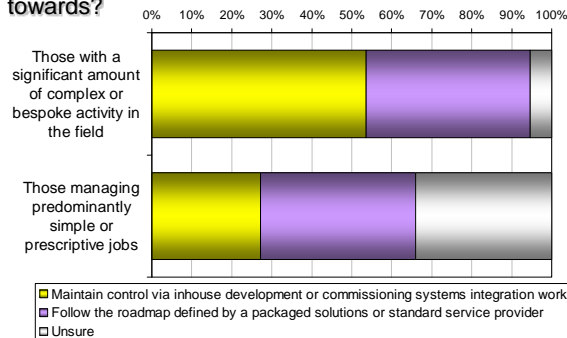
In terms of systems evolution to meet your future requirements, which of the following do you tend towards?

- Those with a significant requirement to schedule on demand
- Those with predominantly fixed schedules

□ Maintain control via inhouse development or commissioning systems integration work
□ Follow the roadmap defined by a packaged solutions or standard service provider
□ Unsure
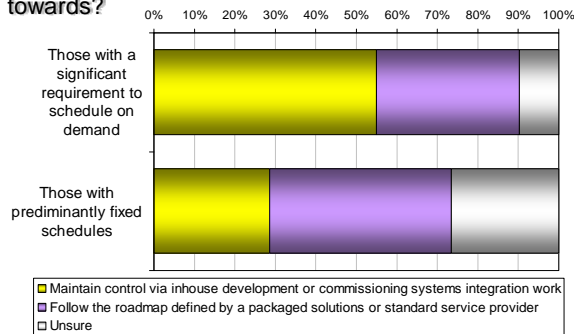
Dynamic scheduling drives a need for more tailored solutions.

Figure 8

In terms of systems evolution to meet your future requirements, which of the following do you tend towards?

- Those with a significant amount of complex or bespoke activity in the field
- Those managing predominantly simple or prescriptive jobs

□ Maintain control via inhouse development or commissioning systems integration work
□ Follow the roadmap defined by a packaged solutions or standard service provider
□ Unsure

Tailored solutions are also a requirement for those with more complex field activity.

Figure 9

These preferences are perfectly understandable. If you have the kind of operation that is relatively fixed and prescriptive in terms of the way work is scheduled and carried out in the field, it is much more likely that you will be able to find an off-the-shelf package or hosted service that is capable of dealing with your requirements from a functional perspective. As soon as you start to introduce a level of complexity, however, whether in terms of the types of job being executed, or the way in which schedules are managed, the chance of finding a solution that meets your needs "out of the box" with a roadmap that will adequately cater for your future requirements is significantly lower.

Picking up on this last point, there is evidence that some organisations who have invested in packaged mobile solutions in the past are already reconsidering their decision, most likely due to the constraints we have mentioned. Around 25% of those that have gone down the on-premise package route in particular currently regard their solution as legacy (Figure 10).

Figure 10
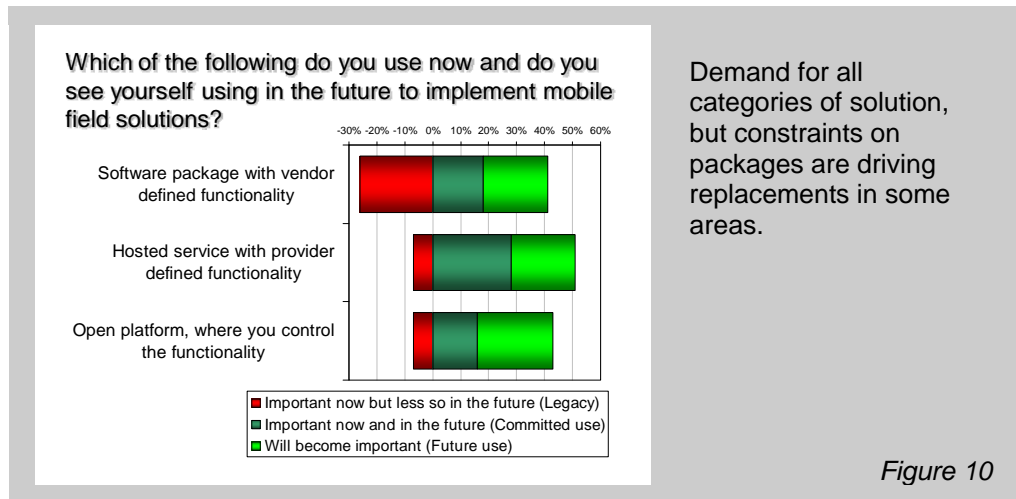
We suspect this picture reflects a couple of aspects of the way in which the market has matured over the past few years.

Firstly, early adopters, keen to drive rapid ROI were often tempted by the promise of the accelerated implementation times typically associated with the package or plug-in approach, even though it may not have been the most appropriate for their needs. It was only later, as their requirements evolved as a result of early experiences and/or changing business practices, that the mismatch and constraints became apparent, which in turn has precipitated a switch in emphasis.

Secondly, the alternative to packages a few years ago, i.e. the build option, typically meant a great deal of low-level programming and specialist hand crafting of basic functionality, which may in itself have put off a lot organisations from going down this route because of the perceived cost and complexity associated with generating and maintaining a lot of detailed code. As time has gone by, however, we have seen the emergence of mobile platform technologies that embrace more of a component based rapid application development approach, which combines the flexibility to tune the solution to initial needs, and the ability to maintain its alignment with changing requirements over time without the traditional levels of overhead in terms of skill sets and cost of ownership that is so often a penalty associated with custom applications.
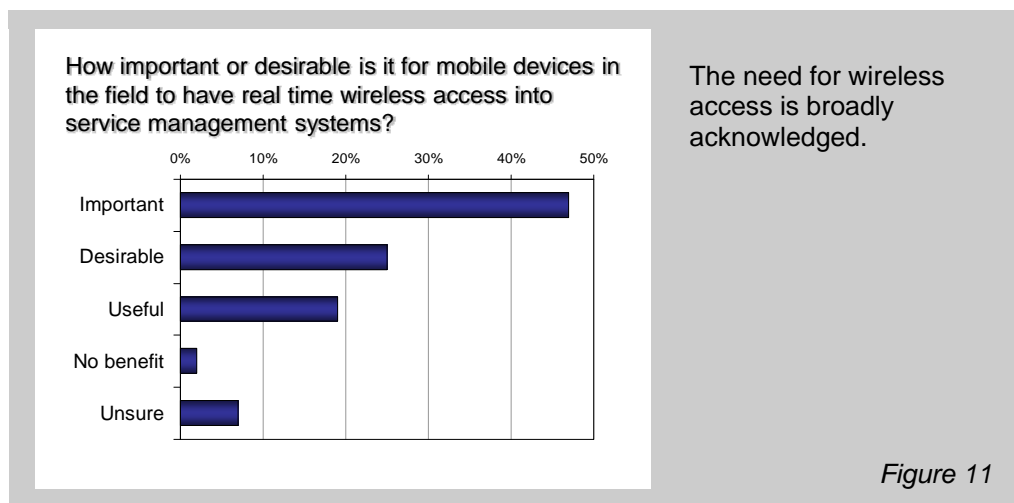
This highlights an interesting phenomenon that we are seeing play out across many aspects of the IT industry in general, not just in the mobile domain. Platform technologies today, whether they be portal environments for building and delivering desktop access solutions, social computing environments to enable the latest Web 2.0 composite application ideas, or mobile middleware to extend the reach of business process automation into the field, are all now delivered with higher levels of pre-existing functionality built into them. The upshot of this is that the gap between the packaged application approach and custom solution approach in terms of implementation and overhead has closed considerably. In fact, many would argue that it is often actually cheaper and quicker to build exactly what the organisation needs using a modern platform and development environment than it is to customise a package solution for which there is less than an 80 or 90% match between business requirements and out-of-the-box capability.

Of course there are no hard and fast rules here, but the considerations we have been discussing highlight the importance of both forward-looking requirements analysis and the need to understand the range of different offerings available on the market today before making a decision on either your first or next mobile technology investment.

Other considerations

In addition to the build versus buy question, there are a couple of other important considerations when selecting a solution and/or approach for moving forward. The first of these is the ability to support real-time wireless communication between the head office or branch and the workforce in the field.

Such communication is not necessarily a prerequisite for a mobile solution, in fact as we saw earlier, there are many more unconnected devices in use today than connected ones in the service management arena, but a strong view exists among those participating in our study that wireless capability is important or desirable as we look to the future (Figure 11).

How important or desirable is it for mobile devices in the field to have real time wireless access into service management systems?

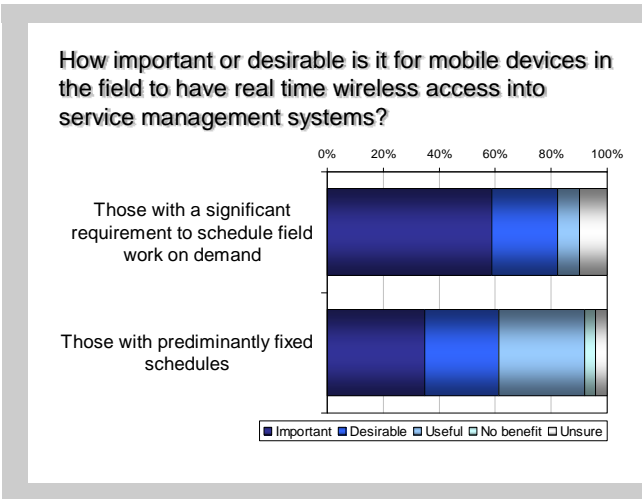The need for wireless access is broadly acknowledged.

Figure 11

One of the reasons for this is because an engineer with a connected device, for example, is much better able to deal with unexpected or unfamiliar situations encountered on a job, as they can both access libraries of technical, product and best practice information held in corporate systems on demand. Being connected, they can also potentially communicate in real-time with either their peers or support staff back at the ranch to help with troubleshooting, identifying the most appropriate solutions and workarounds, etc.

Such capability may not always be relevant, e.g. if the jobs being carried out in the field are relatively routine, simple and prescriptive in nature, but in environments where custom or complex jobs are frequently encountered, wireless capability can make a huge difference to efficiency and effectiveness at an individual engineer level.

At the next level up, wireless connectivity can also help with overall flexibility and responsiveness of the operation as a whole. If those in the field are reporting back on activity either in real-time or on near real-time basis, those managing the service process have much greater visibility of what's going on.
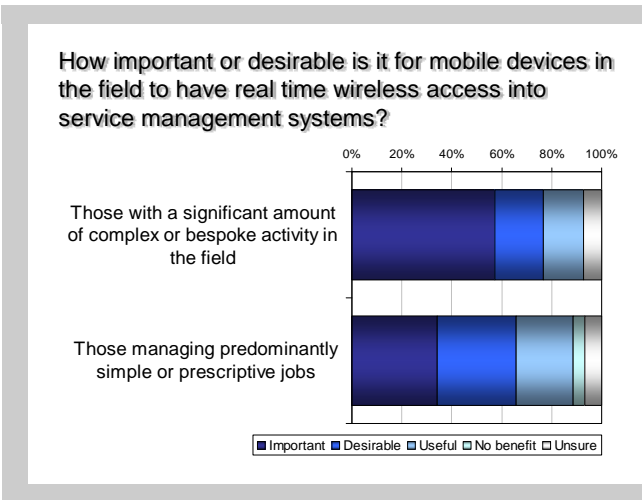
This in turn means potential issues to do with scheduling (e.g. job overruns) or other aspects of job execution can be spotted more quickly and responded to before they escalate into real problems. As part of that response, the ability to communicate directly with those in the field allows adjustments to be implemented rapidly, most obviously by rescheduling on-the-fly as necessary on a totally informed the basis, then disseminating new instructions to the field to redirect fieldworkers accordingly.

When we pull together these potential requirements and benefits, it is no surprise that the research confirms that those dealing with complex or bespoke jobs, and/or dynamic or on demand scheduling, particularly emphasise the relevance of wireless connectivity (Figures 12 and 13).

How important or desirable is it for mobile devices in the field to have real time wireless access into service management systems?

Those with a significant requirement to schedule field work on demand

Those with predominantly fixed schedules

■ Important ■ Desirable □ Useful ■ No benefit □ Unsure

Wireless is particularly relevant for those with dynamic scheduling requirements.

Figure 12

How important or desirable is it for mobile devices in the field to have real time wireless access into service management systems?

Those with a significant amount of complex or bespoke activity in the field

Those managing predominantly simple or prescriptive jobs

■ Important ■ Desirable □ Useful ■ No benefit □ Unsure

Organisations managing complex field work also appreciate the need for wireless.

Figure 13

As a brief aside, while analysing the data associated with the research, we found a very interesting correlation between those already using wireless mobile devices in the field and the perception of the need for more control over the solution via the platform rather than the package approach (Figure 14).

In terms of systems evolution to meet your future requirements, which of the following do you tend towards?

Those using wireless mobile devices in the field

Those using unconnected mobile devices in the field

Those relying on paper or verbal communications

□ Maintain control via inhouse development or commissioning systems integration work
■ Follow the roadmap defined by a packaged solutions or standard service provider
□ Unsure

Requirement to tune wireless user experience?

Figure 14

This could simply be a reflection of the fact that organisations with more demanding or dynamic requirements tend to regard both wireless and the ability to keep control of the development and

evolution of their systems as being important to them, so the link may be more indirect than direct. However, there is probably also an element of those delivering wireless capability appreciating the need to tune the application appropriately in order to achieve the best user experience. This would be in line with other feedback we received on requirements, which consistently highlighted the following wish list in terms of demands from the technology underpinning field service automation systems:

- Tools to tune and manage wireless applications cost effectively

- Tolerance of network unavailability, e.g. when the user runs out of coverage

- Ability to support multiple devices

The findings from the research on this last point are particularly interesting, in that the need for an open platform or application that is able to support multiple devices is often not appreciated by those who have never worked with mobile solutions before, whereas those who have "been there and done that" generally acknowledged this as a fundamental prerequisite for success (Figure 15).

Figure 15
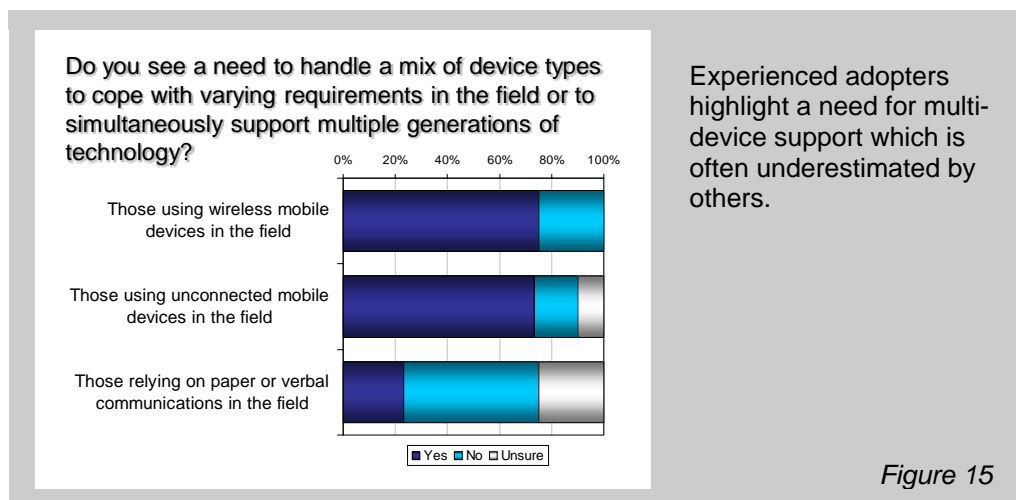
The last major consideration highlighted by those participating in this study is the requirement to work with suppliers who know what they are doing. Whether it is a specialist solution vendor selling a platform or package, a mobile operator offering a hosted service, or a more general systems integration house working in partnership with solution and service providers, the need for appropriately experienced people to assist in areas such as solution scoping, architecture, design, and so on comes across very strongly.

Discussion

The results of this research study are interesting for two main reasons. Firstly, they give us insights into the way the market for mobile service management solutions has been evolving over the past several years. In particular, while many still think of mobility as a relatively new area it is clear that a significant number of organisations are already looking to replace their first generation investment. This is perhaps an indication of both changing requirements as early adopters have gained experience, but is also consistent with a maturing of offerings on the supplier side of the equation providing organisations with many more options and greater capability today than was available, say, 5 years ago.

Following on from this, the second main reason this study is interesting is because of the understanding it provides in terms of the important factors to consider when making future investment decisions. Of particular importance here is the strong correlation we have found between the nature of the field service operation and the style of solution and implementation approach that is considered to be most appropriate. With this in mind, we can advise those with relatively simple and static requirements with regard to the type of work conducted in the field and the way it is scheduled, to start out by looking at packaged or hosted offerings that may be able to provide suitable functionality out of the box, with minimal need for customisation or extension. For those organisations with more

complex or dynamic requirements, however, the packaged solution approach runs the risk of either constraining the operation both immediately and as requirements evolve over time, and/or creating expensive maintenance overhead as a result of the need for heavy customisation. In many cases, adopting an open platform approach based on a solution that has the relevant embedded components that may be rapidly assembled to build a more tailored application can represent a more efficient, effective and future proof option.

The lesson here for organisations either investing for the first time or looking to replace a first generation solution is to ensure that both immediate and likely future requirements are understood before making investment decisions. Beyond the build versus buy question, the feedback that we have received from those with experience around the importance of wireless capability, multi-device support, etc is also relevant here.

Finally, we hope the contents of this report have been useful to help those reviewing options and setting direction for the future in this highly important area, and we would like to take this opportunity to extend our thanks to all of the respondents who participated in such an open and constructive manner in the research study itself.
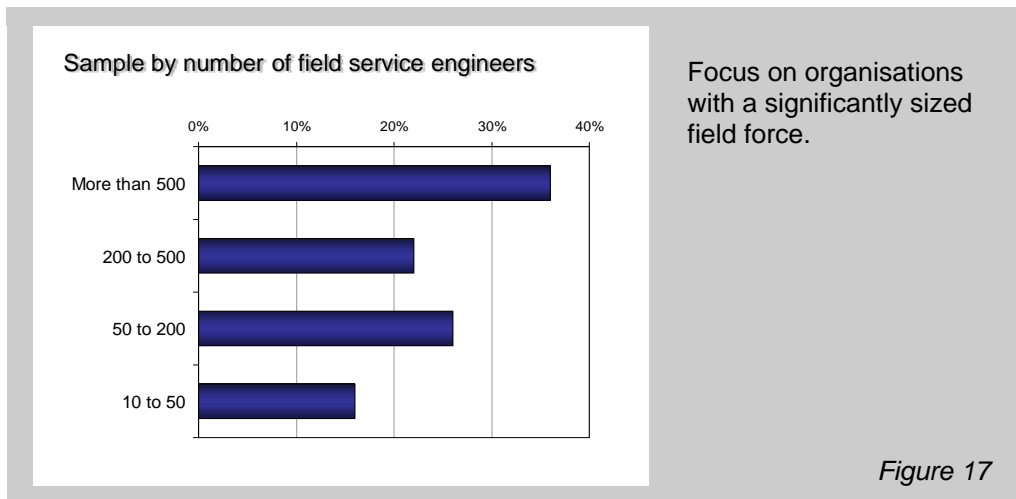
Appendix A

Research Sample

The research upon which this report is based was gathered via telephone interviews from 100 UK based senior managers with responsibility for or heavy involvement in the management of field service operations. A good cross section of industries was included and the distribution by organisation size was as follows:

Sample by industry sector and company size

A good cross section of relevant industries in the enterprise sector.

Figure 16
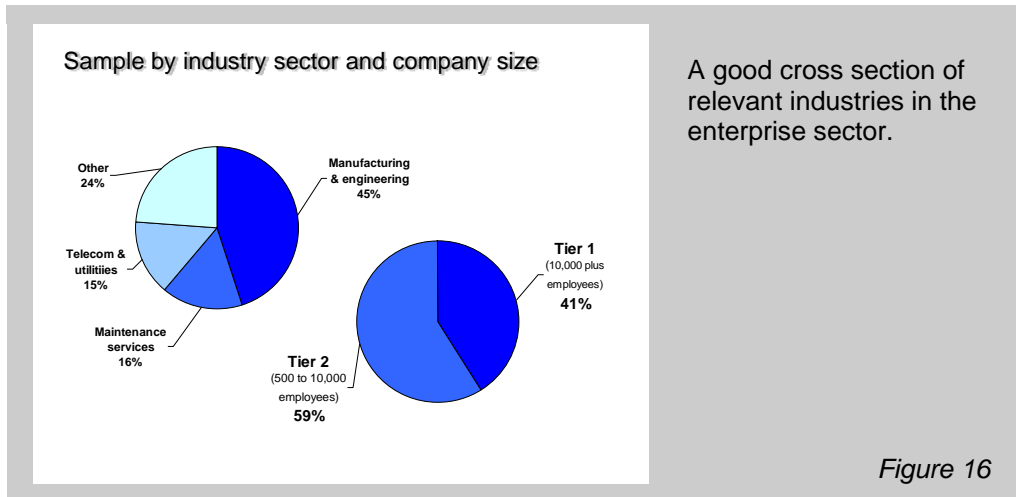
The range of field force sizes within the sample was as follows:

Sample by number of field service engineers

Focus on organisations with a significantly sized field force.

Figure 17

About Freeform Dynamics

Freeform Dynamics is a research and analysis firm. We track and report on the business impact of developments in the IT and communications sectors.

As part of this, we use an innovative research methodology to gather feedback directly from those involved in IT strategy, planning, procurement and implementation. Our output is therefore grounded in real-world practicality for use by mainstream business and IT professionals.

For further information or to subscribe to the Freeform Dynamics free research service, please visit www.freeformdynamics.com or contact us via info@freeformdynamics.com.

About Momote

Momote provides tailored wireless solutions that work across multiple platforms and devices, with a particular focus on field service management. Its fresh approach to mobile application development combines innovative technology with a unique consultancy model. This enables the rapid delivery of highly connected yet resilient applications that are not only tuned into current business requirements, but are flexible enough to evolve cost effectively as processes and priorities change over time.

The Momote approach has already been recognised as a compelling alternative to fixed functionality offerings that can so easily become a straightjacket, and pure "ground up" development projects that consume so much time and resource to deliver and maintain. Key to Momote's success has been the creation of the optimum mix of embedded platform capability, developer freedom, and toolset efficiency, complemented by an agile results-oriented implementation methodology.

For enterprises and independent software developers who simply want a modern and future-proof foundation upon which to build their own mobile solutions, the Momote MX Platform is available as a fully supported product in its own right.

Please visit www.momote.com to learn more about Momote and its solutions.