LinksPoint White Paper

Getting It Together in the Field

One Selleck Street
Suite 330
Norwalk, CT 06855
www.linkspoint.com

Phone 203.853.4600
Fax 203.838.0688
Latitude: 41.10705
Longitude: -73.40905

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By Strite Potter, President, LinksPoint Inc

The convergence of information technology, telecommunications and handheld electronics brings important advantages for field workforces. Very often, access to data stored in information systems is limited to fixed-wire networks, a serious limitation in the field. For companies with a significant mobile workforce, tremendous value can be realized in developing a mobile information strategy. If the mobilization of information system access is staged properly, significant returns on investment can be achieved in a relatively short period.

The pressure to increase operating efficiencies is constant for both corporations and governments alike. Corporations are constantly under pressure to seek increasing efficiencies as a means of competition. The company that finds one or more ways of becoming more efficient benefits from a widening profit margin or gains market share by lowering prices while still maintaining profit margins. Governments are also feeling the pressure to operate more efficiently due to increasing demands on financial resources without the development of new revenue sources. While both sectors use technology to increase the operating efficiencies of office workers, neither sector has significantly adopted information technology to increase the productivity of field workers.

Most data utilized by field workers is analogue, in the form of information printed on paper. It is ironic that most of the companies building the next generation of communications networks, those networks that will utilize optical fiber, are sending their workers into the field with work orders, equipment diagrams, maps and installation instructions all on paper. Governmental agencies that perform most of their functions through field workers in areas such as health care, police, fire and regulatory inspection could and should benefit from the use of use mobile information systems. The development and use of a mobile data system strategy would dramatically reduce operating expenses, allowing these institutions to do more with less. The question begs to be asked: why has there been such a low adoption of mobile data systems from institutions that have a significant portion of their workforce in the field?

There are two reasons many organizations have not instituted a mobile data system: complexity and cost. Both of these issues can be addressed. Simple analysis of the mobile information system value can demonstrate the return on investment. And, if implemented in a controlled, staged manner, the technical risks associated with complex systems can be obviated. The key to developing a successful mobile data system implementation is in prioritizing and staging the features of the system. This allows the institution to address both the complexity of the system architecture through a simpler initial implementation and determine the value of each feature implemented.

Choosing the Right Hardware

An important element of the system is the mobile device hardware. Choosing the right hardware for the application can be difficult. The key issues to consider in deciding what device to use are:

- What applications will be used on the device? Are the graphics capabilities of the device important?
- Or, Will the information viewed be primarily textual?
- What are the environmental conditions under which the device will be used?
- Will it be used in wet, extreme cold and/or hot environments?
- Does the device need to be 'rugged-sized?'

Ruggedized mobile computing devices have a long expected life cycle due to the fact that they can withstand rain, severe temperature and a high environmental particulate (dust) density. Such a device often allows for attachments, such as a GPS receiver, to be attached, allowing the device to be used in a wide variety of applications. Ruggedized computing devices are more expensive, US$1,000 or so, because of the engineering required to meet the specifications of challenging environments, but very often the added initial expense is reasonable when compared to the cost of frequently replacing non-ruggedized equipment.

If, however, it is expected that the user population will be using the mobile computing device under 'normal' conditions, many less expensive alternatives exist. The most popular devices for non-rugged environments are from Palm (III, V, VII, 500, 505…), using the Palm operating system (OS), and Compaq (iPaq), using the Windows CE OS. Again, the features and cost of these devices vary. Deciding which device to use should be driven by the requirements of the applications to be deployed. Devices using the more robust operating system, Windows CE, are more expensive, but very often the less dynamic and less expensive Palm devices provide more than enough functionality for the requirements of the application.

Wireless: Only a Feature of Mobile Data

One of the greatest hurdles in initiating a mobile data solution comes from the perception that the system needs to incorporate wireless communications. In fact, this feature should not be incorporated until much later in the deployment of the system. This is because the wireless data communications element is often not a cost-efficient component of the system.

The equipment and service costs of adding wide area network (WAN) wireless data access significantly impacts the rate of return on investment and should be evaluated after the initial mobile solution is implemented. True, certain features of a mobile data system are best served by a wireless connection, such as emergency work, order delivery, field worker location identification and alerts of newly identified hazards. Most of the information that mobile workers require while in the field, however, is data that can be downloaded to a mobile device from a wired connection. Just as information is printed in anticipation of its

use in the field, the same information should be transferred in a digital format to mobile devices.

Determining Mobile Data System Value

Individuals responsible for determining the value of instituting a mobile data system might ask whether merely making data mobile provides any value if the two way exchange of information is not real-time dependent. In answer to this question, the institution should consider that the value in having data stored and exchanged via mobile computing devices comes from several efficiencies. The most obvious savings come from the fact that information that changes frequently no longer requires repeated reprinting and redistribution.

Additionally, the data acquired in the field, such as changes to the location of assets or outside plant infrastructure, can be captured digitally. The new information is automatically inserted into the system, rather than being input by data entry personnel, speeding the distribution and decreasing the cost of acquiring the information.

There is significant value in creating a digital document trail other than decreasing the cost of printing and distribution. Many municipalities around the world are looking to decrease the amount of time it takes to process information in an effort to reduce costs. A good example of this can be found in some of the processes the city of New York is looking to mobilize. Several of the city's agencies have people working in the field, such as buildings, health and fire inspectors. Many of the inspections they perform are in response to public complaints.

Until recently, field inspectors have worked with paper inspection reports which are, in turn, handed to data entry clerks who manually input the data into the city's information system. Because of the backlog of inspection forms to be processed, the results of an inspection will often not be entered into the city's information system for as long as a month after the inspection. Because of this delay, some inspections are repeated.

Furthermore, these inspectors often require more information while at an inspection site than the paperwork they carry with them into the field each day can provide. Because of this, they often are unable to complete their work in one visit due to a lack of access to information in the field. Much larger volumes of information can be carried into the field because of the compact nature of information stored on mobile computing devices. Buildings inspectors can't be expected to carry an entire copy of the city's buildings codes and regulations as well as inspection manuals and other relevant documents as well.

The information can, however, be readily available if stored in electronic format on a mobile device. With the volumes of information available in this format, fewer mistakes are made because the exact regulations are available.

The Value of Wireless

Despite the cost of delivering data to the field wirelessly, there are significant efficiencies that can be achieved from using wireless communications for some applications. In the case of field services, such as utilities and telecommunications in the private sector and public safety agencies in the public sector, the delivery of real-time information via wireless networks can have a dramatic result. A good example for each of these sectors is the

value of wireless access to backend Geographic Information Systems (GIS). Real-time access to the information stored in these systems can allow field workers to provide better and more prompt service, which, in one sector, results in lower operating costs and, in another sector, saves lives.

Telecommunications and utility companies require that their networks be repaired as quickly as possible both for business and public safety reasons. When an element of these networks fails, companies need to respond as quickly as possible. One way of assuring a quick response is to have the field worker's current locations posted to the GIS via wireless communications. When an element of the network fails, the GIS can automatically identify not only the field crew closest to the failure, but also, if the vehicle's inventory is included in the database, which crew is best equipped to respond to the event. Some GIS allow for this level of granularity. With wireless access to field crew location information using GPS, system failures can be addressed in a timely manner, not only saving money but also improving service.

Live, wireless access to GIS has significant value for government agencies as well. Fire departments can access information on building ownership, hazardous materials licenses and the proximity of necessary water sources during fires. Access to this information allows fire departments to respond more efficiently and in a safer fashion. The collection of information by public health officials can also be served by wireless data communications.

In cases of infectious disease control, some diseases can spread fairly quickly and so time becomes an important factor in collecting and analyzing the information public health field workers need. If mathematical models of a virulent infection are updated via wireless data collection from the field, hours and even days may be shaved from finding the source and determining the pattern of an infection outbreak.

Simplify the Process

The mobilization of data will result in significant returns on investment by quickly creating demonstrable operational efficiencies. In most cases, tremendous reductions in operating expenses can be achieved by giving mobile workers access to enterprise information while in the field. This can be achieved for a relatively small cost by digitizing the information flow in both directions and giving field workers access to the data via mobile computing devices.

The use of wireless data communications can offer additional value by increasing the rate at which information moves, but this value is only for information that has a strong temporal component. Staging the implementation of mobile applications and application features can reduce the complexity of developing and implementing a mobile data strategy. Additionally deploying applications by staging their introduction allows financial analysts to determine the cost benefit of each mobile application.

Developing a mobile data strategy can be a daunting task. However, delivering enterprise information to mobile workers will produce a significant ROI and create new efficiencies that allow the organization to become more competitive.

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About LinksPoint

LinksPoint provides Location Powered Solutions built around three enabling technologies – Global Positioning System (GPS), Geographic Information Systems (GIS) and Mobile Computing. LinksPoint helps enterprises work more efficiently with solutions for vehicle tracking, navigation and field data collection. LinksPoint's products are used by transportation companies, utilities and government agencies. LinksPoint technology was used by the FDNY at Ground Zero, an application that won the 2002 Exemplary System in Government Award from the Urban and Regional Information System Association (URISA).

Products & Services: LinksPoint tools make mobile workers more productive including, *GlobalPoint RouteTrak™, GlobalPoint AVL™, Field Data Collector™* and *Destinator™*. The company also manufactures the *GlobalPoint GPS™* line of specialized GPS receivers for mobile computing devices and ruggedized handheld computers.

Contact Info

LinksPoint
One Selleck Street
Suite 330
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Phone: 203.853.4600
Fax: 203.838.1688

info@linkspoint.com
sales@linkspoint.com
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