Location, Location, Location

Using wireless to deliver process improvement and innovation

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Can you imagine a world of absolute omnipotence, where you have 24 x 7 visibility of everything in your business domain, complete control over your capital assets, and a constant, real-time knowledge of the presence and mobility of all your devices and personnel? It's not magic, voodoo or even temporary insanity... but technology -coming to life as a practical business application. Something exciting is about to happen in the mainstream technology world that's poised to bring far-reaching operational improvements to a broad range of industries and, specifically, the manufacturing, healthcare and retail industries. Analysts agree that this is a major new technology opportunity waiting to happen. According to industry analysts IDTechEx, this market "will explode over the next ten years" and Frost & Sullivan predict "a 30% CAGR, from USD 180 million in 2006 to USD 1.26 billion in 2011."

Location services are **services that deliver information about the geographic location** of mobile assets.

So what exactly is this new technology wave, how does it work, and more to the point, is it something you should be investigating now to fully exploit the operational benefits and secure a competitive edge before the rest of the market gets wise and the advantage is lost?

The technology is wireless LAN-based Real-Time Location Services (RTLS), which we'll refer to as location services in this opinion piece. Put in simple terms, they are services that deliver information about the geographic location of mobile assets. By attaching a simple device like an electronic tag to a movable asset, you can use location services technology in conjunction with a wireless network to keep track of items large and small, single or multiple, and co-ordinate rosters, timetables, work and equipment flows and orchestrate a seamless and efficient workflow that not only keeps track of your expensive, capital-intensive assets, preventing theft and misplacement, but allows you greater return on their use and deployment.

Imagine the operational possibilities of being able to exploit every workable hour of an asset's life, every day, every month and then cumulatively over the span of its working life. The increased efficiencies; decreased need for additional equipment; the quicker, better service you'd be able to offer, simply by maximising the full working potential and availability of a single device, are incredible. Multiply that over several or even hundreds of devices, and you'll start to see just why, coupled with the enterprise WLAN adoption trend, location services are starting to create a groundswell of excitement for those with their finger on the pulse of market and industry trends.

Location services at a glance

- A wireless solution that enables companies to track and monitor mobile assets across the organisation to optimise business processes

- Brings visibility to critical applications like high value asset tracking

- Enables IT management, location-based security and policy enforcement based on temperature, humidity, etc.

Typically the technology is being taken up in large-scale manufacturing, healthcare and automotive concerns.

Location services are typically applied in the following manner

Wi-Fi-based Active RFID tags are attached to the assets or personnel you want tracked. These tags emit a wireless signal, either at a regular interval or when triggered by an exciter. The signal is received by the wireless LAN access points (APs), and sent to a location engine. The location engine determines the tag's location, and sends it to the visibility software.

The visibility software then uses the location data to display maps and reports, enable searches, create alerts, manage assets, and enable a range of related functions.

The technology uses a range of solution approaches

- Triangulation uses a high access point (AP) density approach enabling the system to pin-point the exact location of the asset

- Presence uses just a few APs to cover the zone and lets staff know that the asset is in a specific area, but not necessarily an exact location

- Choke-point uses devices called exciters, which are usually placed at entrances or exits of a room, floor or building. As the asset passes through this "gate", an alert is triggered in the system

Location services are ideally suited for use in major, capital-intensive industries such as healthcare, logistics, distribution and transport, or facilities management and retail. Why? Because it's in these industries, that the compound efficiencies really deliver bottom-line benefits. How can a location service help deliver results for these organisations? Broadly speaking, location services work as a business tool because they provide the capability to monitor and optimise business processes, i.e. they use wireless LAN technology to improve production and other business processes to the point where the optimised process delivers a tangible competitive advantage.

Some common business requirements that Location Services address are

- Maximising the utilisation of valuable shared mobile assets

- Streamlining inventory management and device or people tracking

- Telemetry to relay temperature, pressure, or humidity information about a critical device's environment

- Voice over Wireless LAN (VoWLAN) and Emergency or 911 applications to identify the location of a distressed caller.

Location services offer the healthcare sector, the **ability to quickly and surely locate critical care** equipment and personnel.

Let's take a closer look at the potential benefits of the technology

Location services deliver tangible benefits for companies using business-critical wireless LANs

• Proactive location-based alerts based on device movement or absence and zone entry or exit

• The scalability and flexibility to track thousands of wireless clients and tags

• Centralisation for quick browsing of devices across different buildings, floors and areas

In a nutshell, location services improve workflow. We take a closer look at the specifics of how this is achieved, in three specific industry sectors and the scenarios that follow.

Location services get operations going

Ensuring care in health

The primary benefit location services offer to the healthcare sector is the ability to quickly and surely locate critical care equipment and personnel. The spin-off benefits are multiple and include the ability to better exploit the working life of expensive, specialist equipment, leading to improved diagnostics and treatment; reduction of over-ordering of assets and equipment due to waste of current resources; the ability to improve customer service by reducing patient wait time and synchronise equipment needs with patient requirements, reduce staff waiting time and improve business processes – all combining not only to provide better patient care and potentially lifesaving improvements in processes, but also to produce a better, more efficient and cost-effective business. Location services help hospital administrators to empower staff to record better response times to emergencies, improve the often stressful work experiences of nurses and doctors, and maximise equipment utilisation, leading to the need for less capital-intensive inventory, and greatly reduce the incidence of stolen or lost equipment.

Let's take a closer look at how location services would operate in the healthcare environment

Take the average hospital or similar medical facility as our model. In the typical hospital, clinical staff spend significant (wasted) time searching for medical care equipment every day. At any given time, the typical hospital cannot locate 15-20% of its assets. According to research statistics compiled by IDTechEx in January 2007, the time spent searching for these assets equates to USD 1,900 per nurse sent to physically search for and locate the specified equipment. And the problem spirals even further out of control, because it has the knock-on effect that staff will resort to renting a unit, or hoarding the equipment if they find themselves with

the machine at hand, when they are faced with the constant battle of having to locate it when they need it. The result is a wasteful over-provisioning of equipment needed to provide patients with the care they need, driving down operational profits and ultimately driving up the cost of providing healthcare.

Its not only equipment that needs constant monitoring and tracking: in some cases the patients do too. When clinicians are performing time-sensitive procedures, they need to know the affected patient's location and condition continuously. Other patients may simply want to get out of bed against orders – in these cases a "sitter" may be assigned to them, which again is incredibly wasteful and frustrating in the fast-paced healthcare environment. Tracking the location of older patients with dementia or newborns can also increase security and avoid high profile security breaches and other incidents.

Location services have the ability to literally revolutionise standard healthcare processes and make everything work in better, quicker and more efficient ways. By simply attaching the electronic tag and implementing the tracking system, when a call goes out for a specific piece of diagnostic or clinical equipment, the medical team can be instantly advised of the location of the nearest appropriate equipment and can despatch a team to fetch it, eliminating hours of wasted search time and unnecessary duplication in purchase orders. Tags attached to incubators and infant cradles in hospital nurseries can alert personnel to unauthorised or suspicious movement of infants, and so on. In effect, location services allows a mobile workflow, simply by optimising the use of existing resources. Business process applications such as bed management need fast, accurate status updates – without an automated mechanism, turnover time lengthens and admissions slow down – incredibly, the average wait time is seven hours! As a patient arrives in ER, knowing caregivers must be available in the area at the time of admission to make it possible to rapidly allocate resources as needed.

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Some real benefits gained by actual hospitals include:

- Short term equipment lease reductions: Save USD 400,000 – USD 500,000 annually through equipment loss prevention and the reduced need for new purchases

- Labour cost reductions: Reduce the time taken by staff to locate equipment

- Asset visibility integration: Gains of up to USD 1 million from optimised bed returns and admission discharge transfer

- Locate staff in emergency situations: Locate and call the nearest healthcare provider with mobile Wi-Fi phone. The alarm is then sent to a predefined group of users for help

Leaner processes for manufacturing

After healthcare, the manufacturing industry is also leading the way in the adoption of location services. In the factory, the ability to locate major parts and tooling, often over a large area and on a timely basis, is absolutely critical. The industry, like many others, has increased its adoption of wireless LAN technology to improve communications and delivery of information across plants and warehouses.

The combination of wireless LAN technology and location services allows companies in the aerospace, automotive and industrial space to optimise their business process effectiveness.

Analyst firm, ABI Research predicts that the market for this technology from the aerospace and defence industries will reach USD 2 billion in 2011. Frost & Sullivan sees heavy manufacturing (aerospace, auto, industrial) as having some of the strongest growth in the location services industry, averaging 17.3% over the next five years. These numbers are not surprising as these companies face key challenges around inefficiency in the production areas and distribution facilities leading to missed opportunities in retail – directly affecting the bottom-line. Let's explore a couple of example in the automotive industry where location servicves can impact the quality of production process and increase retail revenues and customer satisfaction, one at the production facility and one at the distribution centre.

At any given car manufacturing facility, the issue of parts replenishment arises pretty consistently. The problem is actually two-fold. First, at a particular stage in the production line, the inventory for the part to be installed may be empty. Now what? Staff will need to walk over to manually communicate to plant administration that there is lack of inventory line-side. This is of course may end up halting the production line, as part installation is usually done in sequence. The staff experience of the manual process is also not ideal.

A commonly implemented is to over-provision so that there is always enough part inventory. However, results in larger inventory stocks than necessary. Not only is this a potential waste of resources, it also impacts capacity and space at the line-side. A more ideal solution would be to use the existing wireless network infrastructure to communicate inventory shortages. A call button tag could be mounted near the inventory and, when the supply begins running low, the employee simply presses the call button and a message is automatically sent through the WLAN that replenishment is needed. The required stock for a specific location is then delivered. This allows plant administrators to reduce line-side inventory stocks and increase capacity on or the complexity of the line.

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Second, once vehicles make it out of the production facility, there are issues at the distribution centre that need to be addressed. For example, a particular centre may service an entire town or city and have the lots holding thousands of vehicles. Tracking all the vehicles across the premises provides an accurate inventory count and can also be used to quickly locate a vehicle to be sent to the dealer, ensuring all distribution procedures and processes (for example, accessories installation) are followed. A combination of wireless LAN technology, Wi-Fi based active tags, visibility software and handheld devices allows easier inventory tracking and vehicle monitoring as they move around the lot or within the service or maintenance centre building. All necessary attributes of the vehicle can be stored in the visibility software system, meaning employees can search for and locate vehicles more quickly and efficiently either from a main desk or whilst walking about in the lot using handheld devices. The system can also ensure all necessary procedures are followed before the vehicle is released to the dealer.

Get moving with location services in logistics, distribution and transport

Logistics and transport providers can make great use of location services as they face a daily risk of sub-optimal operations due to lack of information. Without visibility of the packages and equipment within their control, delivery satisfaction levels can be severely impacted. A transportation company offering express delivery across a regional geography, ships goods within containers to simplify transport, increase security and prevent undamaged during transit. A shortage of these containers at a depot centre, coupled with a lack of visibility of where additional containers are, can create unnecessary delays in packaging goods into containers, loading those containers on the trucks, and getting the trucks on the road.

Not every technology is a fit for every organisation. So even if the logic and the benefits appeal strongly to you, **if they don't dovetail with your business processes and goals**, then **it's not a good spend** of your IT budget.

Next steps for location services in your organisation

Not every technology is a fit for every organisation. So even if the logic and the benefits appeal strongly to you, if they don't dovetail with your business processes and goals, then it's not a good spend of your IT budget. How do you know if location services would be a good technology fit for your organisation?

Here are some of the red flag markers that indicate a 'match':

- Your business requires an automated way to locate and track assets and people

- You want to leverage an existing wireless LAN infrastructure and optimise the features and capabilities it offers

- You have some clear and urgent pain-points in your business – things such as waste due to over-provisioning; poor use of staff time due to a continuous search for critical assets; and low customer and employee satisfaction because of the ongoing frustration of having to deal with inefficient business processes

Still unsure? If you find yourself pondering the following questions, then location services is a path you will want to explore further:

- How effective is your current system for tracking and location of equipment?

- Do manual inventory systems slow down the inventory tracking process?

- Is your current communication system an effective way to get in touch with experts (such as doctors and nurses) or other key personnel, regardless of where they are in your building, facility or the general vicinity thereof?

- Would mobile wireless computing assist production inventory control and mobile staff communications?

The technology and its capabilities are an especially profitable fit operationally for large manufacturing industries where repeatable processes, intense capital investment and the pressure of non-negotiable deadlines and timeframes make traceable, locatable and movable awareness of capital assets a hugely profitable business tactic. If you've checked the boxes on the red flag questions, then this is an emerging technology you need to investigate for your organisation.

For further information visit: **www.dimensiondata.com**

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