



Realising the real benefits of asset tracking and management using the latest technologies

A difficult financial climate has put the Construction industry under real pressure, so in order to maintain their growth, and in some cases even survive, they need to find new and better ways of working to win new business and drive down costs.

Now more than ever, Financial Directors are pressuring managers to take control of spending with plant and tools being a key area. Enter tool tracking. But as well as making cost reductions, the smart Construction companies are realising that by managing their assets they can add profitability, Health & Safety compliance and customer service to the list of benefits.

Using a combination of the latest technologies - RFID (Radio Frequency Identification), GPS, mobile computing and web-based applications - asset management can now be undertaken reliably and rapidly, anytime and anywhere. This paper explores how, implemented properly, end-to-end asset management can meet the needs of today's cost conscious and mobile workforce.

Cost reductions

Waste, theft, and sub-hires from external plant companies. Most managers will rate these as the areas of high cost to target. Yet many Construction firms with a large asset base tend to concentrate on their expensive plant and equipment and overlook smaller items. Taking control of consumables such as Personal Protective Equipment (PPE), timber, fuel and signage can significantly impact the profit in a contract if they're allowed to slip through the net without careful scrutiny.

Organisations like Construction services company, Byrne Group, are also recognising the value of managing tools and equipment previously treated more as 'disposable' assets. Tracking such items can make staff more aware of waste.

"We saw a definite shift in behaviour after we introduced RFID enabled ID cards to assign tools and equipment to staff," says Matthew Preston,

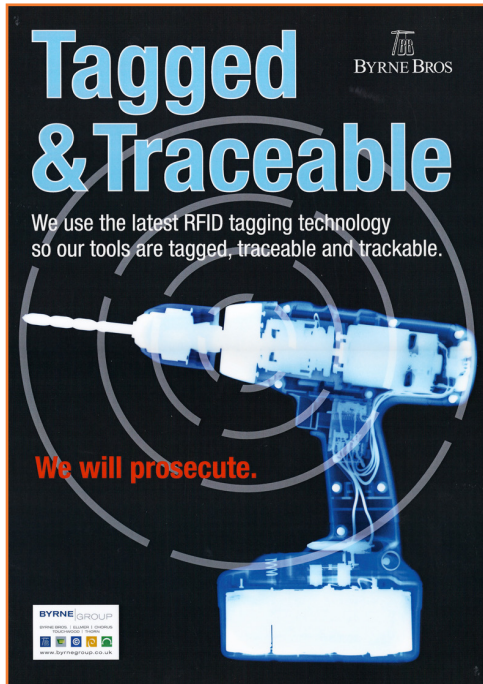
Group IT Director at Byrne Group. "Through personal accountability, we saw the use of consumables such as PPE drop considerably, even in the first month."

Theft

Theft is a well known issue within the Construction industry, but is something that Byrne Group has managed to tackle head on as part of its asset management and tracking as Matthew Preston explains: "Previously there wasn't an effective theft deterrent in place and so a considerable amount of tools were getting lost or stolen each year. The RFID enabled ID cards ensure that staff take the responsibility of tools within their care seriously."

Byrne Group have also put up 'Tool Tracker' posters around their sites to remind staff and warn potential thieves that their tools can be tracked.

“We have seen a 50% reduction in the number of thefts.”



The message reads “Tagged and Traceable: We use the latest RFID tagging technology so our tools are tagged, traceable and trackable. We will Prosecute.”

“The results have been remarkable”, continues Matthew Preston. “We have seen a 50% reduction in the number of thefts.”

GPS tracking

For larger machinery and plant equipment, GPS tracking can be a very effective theft deterrent and a way to optimise on-hire rates.

“Having no accurate method of knowing exactly what is where and when or if it has been returned is an issue we often hear from customers”, says Hiten Kantelia, Managing Director, at 4hSolutions. “GPS tracking can be used to pinpoint exactly where an asset is situated, whether it is being used and if it has been sent to site, avoiding costly duplication and hire charges.”

Clearly GPS tracking is a well proven solution to plant theft.

“We often publish details about stolen plant equipment both within communications to members but also to a wider market to protect both members who might be offered the equipment on the black market, but also to raise the issue amongst a wider audience. So a deterrent like GPS tracking to discourage the theft in the first place, and also help to track it if it does happen, is a pragmatic and realistic solution embracing the latest technology but also utilising it to best effect for the industry” says Graham Arundell, Managing Director at HAE (Hire Association Europe, www.hae.org.uk) who represents hire companies in the tool, equipment and plant hire sectors.

Maximising on-hire rates

Handheld PCs with integrated RFID tag readers can scan and identify assets at the point at which they are returned from site and recorded as ‘Off-Hire’ or ‘Returned’. The back-office or hire desk system, such as COINS, Oracle or SAP can then be updated automatically. The accuracy of the data and the speed at which it is received back into this system ensures that the item is immediately ready for hire or issue again. Maximising on-hire rates, for internal and external customers, ensures Construction companies make the most of their assets and minimise the need to sub-hire equipment from third parties which makes a real difference to their bottom line.

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Improved customer service

“Tracking all of our assets – plant, tools, stock and consumables - has enabled us to improve the quality and speed of requisitions to site. This positively impacts the service we offer our end customers (as well as our internal clients on site) as they get visibility of the requisition and delivery timescales.” says Matthew Preston of Byrne Group.

Customer Service can be further enhanced with GPS tracking as Duncan Crome, Director at Priority TM Ltd who supply traffic management solutions, has found: “With GPS tracking, we know exactly where our vehicles are so we can give the customer an even more accurate indication of when they will arrive on site.”

Inspections and pre-planned maintenance

Managing pre-planned maintenance and inspection schedules should be at the heart of any end-to-end asset management system as it forms an integral part of the asset lifecycle.

The latest mobile technologies make managing maintenance and inspection processes easy. Handheld PCs with integrated RFID tag readers can now deliver a complete set of tools for fitters, technicians and engineers, working both in workshops or on remote project sites, that eliminate paperwork, give positive proof of identification, prove attendance and deliver complete data validity by removing the need for manual data entry.

RFID enabled handheld devices can be used to record and store the results of field inspections and PAT tests (Portable Appliance Testing) for electrical items or LOLER (Lifting Operations and Lifting Equipment Regulations) inspections for lifting equipment. The data captured is immediately available to view online.

In addition to meeting Health & Safety requirements, an accurate maintenance history is formed and can help important purchasing decisions for faulty equipment.

Automation of inspection schedules removes ambiguity as jobs are allocated to engineers in the field in real-time via their handheld PCs. Overdue alerts act as a further measure to ensure inspections and pre-planned maintenance takes place.

“Safety is paramount at Magnor Plant so we needed an error-proof system to manage the on-going maintenance inspection schedule of our lifting equipment at multiple sites” says Jonathan Hall, General Manager at Magnor Plant in Rugby.

“All of our lifting gear is uniquely tagged and we use handheld PCs to carry out and record inspection results in the field. The results speak for themselves: we have streamlined our entire inspection process and have cut post-inspection administration down from 3 or 4 days to 1 with no paperwork.”

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Less risk, better Health and Safety compliance

In addition to cost benefits, Construction companies who are exploiting end-to-end asset management are also reaping the Health and Safety benefits.

Using RFID technology and Web databases to track and record maintenance schedules and carry out inspections of equipment in the field ensures only equipment that has been inspected can be requisitioned to site. Inspection Certificates that are generated directly from fieldwork are immediately available to view centrally via the internet for Health and Safety checks.

Having an audit trail for the issue and return of tools and for the inspection, maintenance and hire history of assets aids HSE (Health & Safety Executive) compliance.

“Improving site safety and reducing administration were the key drivers for us, but by being able to prove inspections have taken place with the relevant documentation stored electronically has meant, by default, improving our HSE compliance.” says Jonathan Hall of Magnor Plant.

Having an inventory of assets does not constitute real asset management or necessarily meet Health and Safety requirements. An asset database is only as good as the data it contains so with a manually maintained asset register, how can companies be sure that plant and tools that haven't been certified or have been disposed of are updated on the system and cannot reappear into circulation?

With RFID technology it is easy to record and store every movement, including the disposal of the asset. Warnings and overdue alerts add a further measure to ensure that Health & Safety rules are not inadvertently contravened, something which Stuart Faulkner, Safety Equipment Manager at Magnor Plant, has experienced firsthand: As part of the Morgan Est group, Magnor Plant undertake thorough

six monthly examinations of every piece of equipment at all of the group's construction sites. “Overdue asset reports tell us if there is equipment on site that hasn't been certified. We immediately inform the site and if they have the item, it can be taken out of circulation until it has been inspected or if is no longer there, is marked as 'disposed' in the asset database.” explains Stuart Faulkner.

This has a huge impact on staff safety and ensures that organisations abide to strict corporate governance rules.

We have the technology

10 to 15 years ago, stores managers started turning to barcodes, scanners and database-driven software as a first step towards an asset management system. Now, organisations are reaping the benefits of new technologies such as RFID, GPS, mobile computing and internet based applications in order to meet the needs, not only of their own stores, but also their mobile workforce and offer a fully integrated tool tracking system.

Mobile workers are increasingly using handheld technology in the field to download and capture information and synchronise with their back-office applications such as SAP or Oracle. Web-based management tools mean that access is available remotely allowing managers to monitor their assets and make key decisions at any time, from anywhere in the world.

“Due to the demanding nature of projects today, information needs to be accessible 24/7 by multiple people in multiple locations. Web-based technology makes it easy to give controlled access to anyone with an internet connection” explains Garnet Hampson, Technical Director at 4hSolutions.

Figure 1. Assets are identified and tagged using a variety of RFID tags



Clockwise from top left: Coin tag with hole, Key fob tags, Intrinsically safe tags, Glass tags, Plastic credit card tags, Stick on tags

Figure 2. Tagged assets can be instantly scanned and identified using handheld PCs



Figure 3. Software on the handheld PC to manage inspection schedules for each asset, capture inspection results in the field (as seen below) and track assets through the on-hire/off-hire process



Figure 4. Handheld PCs can synchronise with a web hosted database accessible by any internet enabled computer



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RFID or Barcode?

So, you’ve made the decision to use Auto-ID to manage your assets, but how do you decide on the whether to use RFID or barcode technology?

“Smart asset management solutions will be compatible with both RFID and barcode technology. However, careful thought and consideration should be applied when deciding on the best solution for your environment and your business.” says Hiten Kantelia.

“As a well-used technology, barcodes may be an attractive option and may actually work out cheaper unit for unit,” continues Hiten.

“However for critical assets that require tracking, tracing, maintenance and user authentication, RFID tagging is a robust and reliable option. In addition to being more durable than barcodes, RFID tags are also reusable, making them a cost effective choice in the long run.”

	RFID tags	Barcodes
Readability	Offer a read range from inches to hundreds of feet. They do not require direct line of sight and are not affected by sunlight.	Read range of several inches up to several feet. They require line of sight and are affected by sunlight.
Robustness	RFID tags are very robust and can withstand harsh environments, operating in temperatures ranging from -25°C to +70°C. Special ceramic tags are also available for even harsher environments.	Operating temperatures range from around 0°C to 50°C.
Reusability	RFID tags can have a much longer shelf-life than barcodes and can be reused multiple times.	Barcodes are not reusable and are subject to degradation with handling.
Identification	The unique identity of an RFID tag makes it possible to manage the entire lifecycle of a single asset.	Barcodes are better suited to an entire class of items because they don’t need to be printed for each individual item.
Resilience	RFID tags can be encased in protective material and are therefore much less prone to damage and tampering.	Barcodes can easily be damaged, torn off or covered in debris making them unreadable.
Fraud	RFID tags are produced with an identity code or serial number from the Manufacturer. This is embedded digitally on the microchip and cannot be changed, making them more resistant to fraud.	Barcodes can be more easily duplicated and therefore counterfeited.
Interference	Can be read through many materials including dirt, paint, grease and snow.	Barcodes that are obstructed by dirt, paint, grease and snow cannot be read.
Cost	Prices vary from 15p to £10 per tag depending on the exact type and specification.	Barcodes cost pennies to print.

Conclusion

Implementing a well-thought out asset management programme can enable smart businesses to take advantage of their existing resources by understanding where assets are, who has them and what condition they are in, all while demonstrating sensible QA procedures and, more importantly, Health and Safety practices.

Taking advantage of the latest technologies such as RFID, GPS and web-based applications brings a level of automation, proof, visibility and reporting that can offer Construction companies a truly end-to-end asset management solution that solves real business needs. However, careful project planning with experienced vendors will ensure that only relevant technologies are used and any system implemented is continually monitored and phased in carefully with the appropriate level of staff training provided.

“We introduced RFID enabled asset management with the aim of improving four key areas of the business: a reduction in costs, more efficient processes, better Health & Safety compliance and improved customer service. In reality, what we have achieved is total site management and these four areas are the welcome by-products” concludes Matthew Preston of Byrne Group.

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About 4hSolutions

4hSolutions specialises in enterprise-level asset management solutions for the mobile workforce. Its modular solution **Assettagz** uses the latest RFID (Radio Frequency Identification), mobile computing and GPS technologies to provide an effective way for organisations to manage the entire lifecycle of their assets.



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