Fast Forward

QinetiQ

Strategic Asset Management

Gavin Richardson is Managing Director of the Finance, Retail and Information, Communication & Electronics (ICE) businesses in QinetiQ.

Welcome to the latest edition of 'Executive Perspectives' which focuses on providing insight into Asset Management and the role this plays in delivering greater business value to your supply chain.

Accenture has provided us with their Market Perspective which, on this occasion, delivers a clear view of the issues associated with the application of technology to supply chains. Furthermore they have outlined a view of where "Silent Commerce" can deliver enhanced value.

This excellent point of view is supported with leading papers in the Insight section. It includes one from QinetiQ that examines the systems associated with protecting the food you eat and also shared learning from both Accenture and IBM that explore the RFID market and the technology associated with making this a success. QinetiQ have also worked with a number of clients where we have helped them understand the challenge of managing major capital investments, some of this is shared in an excellent paper from QinetiQ Consulting.

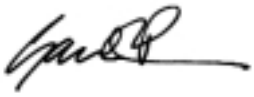
In our Case Study section, we develop the security theme looked at last time and highlight the work we have done to help the Student Loans Company protect their IT Infrastructure. We outline the technology partnership role we have with Wavetrend in the deployment of asset tracking solutions - not always a simple off the shelf solution! Also detailed is the work we have completed with a major retail finance institution to identify significant value from their advertising budgets.

Additionally, News and Technology Watch provides you with 'bite-sized' science and technology insights – I know that this was popular last time and hope the recent update provided similar benefit.

The feedback from the last 'Executive Perspectives' was extremely encouraging and it is fantastic to know that many of you gained value from the information we delivered. The issues associated with securing stakeholder interests are critical and this was reinforced at the event where many of you took time for further discussions. In fact more than 90% found the event to be good use of time and I hope the next event covering Strategic Asset Management offers similar value.

I hope you find the programme to be of use and sincerely hope you will take the opportunity to contact me, or my team, if we can help you to address any of the challenges you face today and into the future.

Yours sincerely,



Gavin Richardson

Next edition

In the next edition of Executive Perspectives the challenges of communications technology will be in the spotlight. The role of communications as a means of delivering a flexible and agile organisation is critical and we will examine how technology will be able to protect and enable you in the use of communications and associated technology.

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Obtaining Value from Silent Commerce

accenture
High performance. Delivered.

What if your products could tell you where they are and how they are being used? What if they could interact with your customers?

You could uniquely identify and track every package as it moves along the value chain from manufacturing to consumer. You could take a warehouse inventory instantly, from your desk. Your products would monitor themselves and could tell you when they were about to go outside acceptable boundaries for temperature, humidity or vibration. The possibilities are endless.

Silent Commerce refers to business benefits derived from new types of applications that can track and monitor objects. Silent Commerce uses reliable and trustworthy communications for tagging and tracking technologies, such as radio frequency identification (RFID) and sensors, combined with continuous Internet connectivity where needed.

The real power of RFID, making everyday objects intelligent and interactive, is behind the scenes: new business processes allow commerce to move more rapidly, more efficiently and with less intervention. Silent Commerce describes the situation where businesses achieve new levels of high performance, dramatic cost savings and efficiency increases through the seamless integration of their supply chain and their business processes. RFID is one of the key technologies that enables Silent Commerce.

Silent Commerce: Why now?

RFID and location-based services such as global positioning systems have been in use for decades. Sensors that detect pressure, temperature or the presence of certain chemicals were developed throughout the 20th century.

Many private and public sector companies are already starting to use Silent Commerce to create new value for customers, transform supply chains, improve the efficiency and performance of existing operations, and save money.

- Wal-Mart is rolling out RFID inventory tracking across its distribution network over the next two years.
- Tesco is asking its top 100 suppliers to move to case level tagging from September 2006.
- The US Department of Defense has a comprehensive plan to use active and passive RFID by January 2005.
- Albertsons, the 2nd largest US food and drug retailer, will require its top 100 suppliers to tag pallets and crates by April 2005.

Advances in manufacturing and materials science have lowered the cost of tagging and sensor technology to the point that it is almost ubiquitous. Innovations such as micro-electromechanical structures (MEMS) and thin and flexible microelectronics have enabled new kinds of applications. The widespread commercial use of technologies such as GPS continues to make such items more affordable.

New technology infrastructures, including high capacity computing, wired and wireless communications and data storage, means businesses can now handle the large amounts of data that are generated by Silent Commerce, including the integration of different kinds of inter-and intra-company systems.

Accenture have written additional papers on this topic and they can be seen in our Insight section or by visiting www.QinetiQ.com/perspectives

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Enterprise resource planning and supply chain systems have matured as well, creating the ability to manage and improve operations based on the information that RFID readers provide. Supply chain partners also are becoming better integrated, which increases the requirements for greater product and supply chain information.

Silent Commerce's Profit Potential – Improving the supply chain

The opportunities for saving money and creating new opportunities with Silent Commerce are significant. For example, the supply chain—the process that takes a product from raw materials to manufacturing to distribution—can account for as much as 75 percent of a product's cost. At each point in the value chain, from the manufacturer all the way through to the consumer, Silent Commerce will drive value through improved efficiency in these and other areas:

- **Greater automation.** Manufacturers, distributors and customers will be able to check all the boxes on a pallet and all the items in a box automatically, without having to open the box or count the number of items manually.
- **Inventory management.** Businesses will know the inventory levels in their facilities and their customers' facilities in real time, allowing more efficient replenishment and smaller inventories.
- **Theft reduction.** Businesses will reduce theft by having systems that reduce manual intervention and counting as well as systems that alert employees as theft is occurring.
- **Anti-counterfeiting.** Using a unique identifier or identification for each product and case, businesses will be able to pinpoint and significantly reduce losses from diversion and counterfeiting.

Benefit from Silent Commerce

With an eye on the market as well as on their competitors, forward-thinking organisations are approaching Silent Commerce opportunities with a view to encompassing other areas of their business.

Accenture recently worked with a leading manufacturer of construction equipment to maximise the utilisation of its dealers' rental fleets. A new system uses handheld computers, RFID tags, and next generation dispatch and routing applications:

- All inventory assets are RFID tagged.
- Dealer yard employees have Personal Digital Assistants (PDAs) with an RFID reader and Wireless Fidelity (WiFi) card.
- Dealers are now able to track equipment automatically and in real time resulting in more efficiency and better customer service.

Another client, Star City Casino in Sydney, Australia, manages a wardrobe inventory numbering 80,000 uniforms valued at approximately US$1.8 million. They found a groundbreaking answer to their laundry-tracking problem by embedding RFID tags in the waistband, shirt-tail or collar of each uniform. Accenture designed and delivered the first-ever wardrobe control system, which tracks uniforms from point of issue to cleaning machines via strategically placed readers.

According to Star City's CIO, "The wardrobe management system demonstrates the versatility of Silent Commerce. By automating a labour intensive manual process, we cleaned up in the savings department with fewer purchases, reduced labour costs and fewer lost garments."

Silent Commerce has now reached a critical turning point in the take-up curve and Accenture sees numerous possibilities for other industries. For example, in Pharmaceuticals, Accenture has formed a consortium of manufacturers, distributors and retailers which plan to work together to prove the business value of the Electronic Product Code (EPC™) and RFID within

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the supply chain. As EPC are integrated into the pharmaceutical supply chain, companies will benefit from increased revenue based on reduced counterfeiting and reversed logistics, out-of-stocks and returns, savings of up to 5 percent from increased labour productivity and reduced shrinkage, and a 5% to 30% reduction in working and fixed capital resulting from optimised inventory levels and superior asset utilisation.

Today's technology challenges in RFID relate to the limitations of existing tags: the amount of data each tag can hold (the data set) and the speed with which existing infrastructures can communicate with the tags (the data rate). In addition, the absence of a global standards body to allocate frequencies in the radio spectrum has meant that solutions cannot yet be implemented globally. However, considerable efforts are underway to overcome the challenges and organisations such as Wal-Mart and the US DoD are progressing with their RFID deployments.

Accenture sees three principal applications for RFID technology: authentication, track and trace. By being proactive, businesses are focusing on how to use Silent Commerce to prevent problems from occurring, rather than just to solve problems. Many companies initially used Silent Commerce to help find things that were lost, such as containers, packages, cars and cylinders. Once those companies began using the technology they realized that the real benefit comes from never losing anything in the first place because they always know the location of every item. It is clear that forward-thinking organisations understand they cannot wait for complete solutions when there are benefits and experience to be gained today.

Achieving recognisable benefits through Silent Commerce is not for every business. Those that have embraced this emerging technology from across a range of industries have already identified how to obtain value from Silent Commerce. To enhance business performance, companies should act now to achieve competitive superiority based on technology innovation. Accenture is excited to be part of this new transformation in business as we work with customers and industry standards bodies to identify where value can be realised.

By Frank O'Dea
Managing Partner, Electronics & High Technology, UK & Ireland

Frank O'Dea has been a consultant with Accenture since 1985 and is the Managing Partner of the Electronics & High Technology sector in the UK & Ireland. He is also the Global Managing Partner of the Finance and Performance Management Service Line within the Communications and High Technology sector. Frank specialises in large scale change programs and transformational outsourcing in both Information Technology and Business Processes. He has wide experience in rationalising back office operations, improving customer service operations and in transforming IT operations. Frank has considerable experience in applying real time telecommunications and network transformation to deliver business benefits.

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QinetiQ

Making the impossible possible with RFID solutions

With the drive to improve the tracking of goods across the supply chain more and more companies are turning to RFID tagging as the answer. QinetiQ have helped Wavetrend, who specialise in the manufacture of Active RFID product, keep ahead of the pack.

Key Benefits

- *Wavetrend's client improved efficiency, reduced waste by 30% and billing time, following production, was reduced from weeks to days.*
- *As a result of the relationship with QinetiQ, Wavetrend were able to secure a contract worth in excess of £100,000 and deliver an end to end solution in short time scales.*
- *Wavetrend and QinetiQ have further opportunities to grow mutual business with other partners and their customers where a standard off the shelf solution would not work.*

Background

More and more organisations are turning to the use of RFID (Radio Frequency Identification) and associated devices as a means by which to manage more effectively their supply chain performance – and as a result are turning to the market to provide solutions that meet increasingly stringent price performance criteria. By tracking their goods and services they are able to generate greater value through improvements in stock visibility, improved efficiency and reduced waste. It is benefits such as these, which have driven the huge growth in uptake. Many analysts are predicting growth in excess of 25% year on year for the next 5 years from current estimates. In this $1bn market over 300 million devices have already been shipped.

Wavetrend Technologies Ltd are a global group conducting research and development of active Ultra Long Range (ULR) RFID technology, as well as manufacturing, selling, marketing and distributing these products and solutions through their significant channel network. They have developed a solution platform comprising of a mix of hardware, software and integration methodologies to address this growing market and are seen by some to be market leaders in this space.

Challenge

Wavetrend have an extensive range of devices for use in ULR RFID solutions, however some of these present technical challenges when being incorporated with the end to end client solution. One such example of this was where their active tags were so effective that the read range was 'too great' so they needed to supply a solution that addressed this for their Client.

In many cases such as this the use of specialised antennae, passive tags or more careful reader placement would overcome the problem although this was not possible for one of their major media customers. Active technology as opposed to passive was mandatory. They required a solution that allowed for a pre-defined read range in a single direction and Wavetrend needed to package the technology to meet this requirement.

"QinetiQ approached the project with a professional and highly enthusiastic attitude - offering the speed and effectiveness generally unheard of within most R & D companies"

Alan Heath,
Wavetrend's UK MD

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An off the shelf solution was not available in this instance so they looked to the market to see where there may be technology partners who could help.

Time was also a major factor in the customer solution as it had to be delivered within a 3 week period.

Solution

After seeing the QinetiQ advertising campaign in September 2003, Wavetrend turned to QinetiQ to see if they would be able to develop a solution to their important problem. QinetiQ Metal Printing (QMP) worked alongside Wavetrend to understand the customer challenge and provide test and evaluation services in the development of a solution.

The QMP team set about the challenge and focused on the development of an enclosure for the Wavetrend technology that would be ensure that a specific read range and direction could be obtained consistently.

QMP took the requirements and initially developed a prototype enclosure based on metallising a standard plastic box – this was completed within a week of the initial engagement and was done so without the use of any chromic acid to overcome pending legislative constraints.

Under consultation 3 further variants were produced over a 3-week period to prove the solution to Wavetrend and their customer. Specifically, the enclosure produced allowed Wavetrend to offer focused antenna ranges of between 0.5 – 3.0m, through the use of metallised plastic (manufactured using the QMP process) incorporating a standard L - RX201 Wavetrend reader.

Since the initial engagement, Wavetrend have used QinetiQ to offer customised solutions to its customers and by pooling the technical resources of both companies, created a situation where all parties win. Chris Bishop, QMP Director, added "We see our relationship with Wavetrend as pivotal as we continue to grow our applications and solutions portfolio. The combination of Wavetrend expertise in ULR devices and QinetiQ expertise offers a very compelling proposition for customers who do not face standard challenges."

Results

QinetiQ produced, alongside Wavetrend, a working solution to the customers challenging requirements within the very short time frame and as a result secured the contract for the RFID deployment for the customer.

Wavetrend secured a contract worth in excess of £100,000 that might have been postponed due to the technology challenges associated with the project.

This simple, cost effective solution, allowed the customer to dramatically improve efficiency and reduce their amount of wastage by 30% and billing cycle down to days instead of weeks.

This collaboration between QinetiQ and Wavetrend has opened up other opportunities worth in excess of £2m for the tracking of ULR tags within the supply chain of major companies, as well as enabling the delivery of application specific solutions that previously were not possible.

QinetiQ Solutions

Technology consulting for Asset Tracking solutions
QinetiQ have extensive expertise across the scientific disciplines associated with making RFID solutions work in challenging environments. With the plethora of hardware components required in readers and tags, customers are turning to QinetiQ to offer some or all of the following services:

- *Technology consulting and solution design*
- *Sensor solutions*
- *Test and evaluation services*

QinetiQ Metal Printing (QMP)
Through partners QMP are able to offer solutions in the following main areas:

- *Production of high volume metallised items such as RFID, Antennae, Smart Card and Printed Circuit Boards*
- *Specific solutions for general metal finishing for flexible and rigid materials*

Further information on QMP is available in "The metal greenhouse" article in our news section.

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Safe Transactions

Corporate governance for public financial institutions recommends that safeguards be put in place to prevent unauthorised computer access to company systems and data. It is clear from the experience of the Student Loans Company (SLC) that an effective Managed Intrusion Detection System (MIDS) can offer this protection.

Key Benefits

- *QinetiQ's MIDS proactively manages and protects the customer's environment 24x7 and this has resulted in zero breaches since system installation*
- *By using a managed service SLC gets a comprehensive, more flexible, service for half the cost*
- *Reports are tailored to the customer's specific requirements to improve management decision making capabilities*

Background

The general consensus is that any reputable organisation needs to take adequate steps to protect the interests of all its stakeholders. Not only that, as access to computers becomes more commonplace, all the indications are that the sophistication and frequency of breaches or attacks will also exponentially increase.

Glasgow-based Student Loans Company (SLC) was set up in 1989 as a not-for-profit, non-departmental Government body and has a central role in the provision of the governments student finance schemes. The Company is charged with organising the payment, maintenance and collection of Government student loans, which are designed to help students meet their living costs while at university or college. It now has over three million customers and is currently in the final stages of introducing a project to provide a single computer system that will be used by students, by Local Education Authorities (LEAs), and eventually by Higher Education Institutions. Students will have the choice of applying on paper to their LEA or online via the Internet - increasing not only the volume of business and network traffic but also its exposure to risk.

Challenge

In 2003, SLC identified the urgent need to implement a secure infrastructure as part of its corporate governance. Any breach of the system could be damaging both to business but would also have significant implications for the success of the Modernising Government Initiative.

SLC undertook a broad search of potential solutions and this included trawling the Internet, speaking with many vendors and seeking recommendations from several sources.

"We considered setting up our own 24/7 service but quickly concluded that buying in an external offering was the practical and economic way forward"

Fraser Harris,
Technical Support Manager,
ICT Infrastructure at SLC.

Student Loans Company Limited

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Solution

Stringent selection criteria are standard procedure at SLC. Compliance with these eventually led to the contract, worth around £150,000 a year, being awarded to QinetiQ to provide a MIDS solution to protect the perimeter of the SLC network from attack. Contributing factors included:

- QinetiQ's clear demonstration that the team working on the account understood the specific problems
- The team's knowledge base for solving future issues
- The confidence that QinetiQ was able to instil in the SLC team
- QinetiQ's related governmental and defence heritage
- Assurances that QinetiQ does not employ 'reformed' hackers

QinetiQ was able to demonstrate that the managed service was a cost-effective solution when compared to other options.

"The cost of providing an equivalent service in-house would have been in excess of £300k and taken a considerable time to bring on-line. Following a series of requirement exchanges with QinetiQ concerning its MIDS offering, we were able to be fully operational in a couple of weeks for just 50 per cent of the cost, plus have access to considerably more expertise, should we ever require it," said Fraser Harris, Technical Support Manager, ICT Infrastructure at SLC.

QinetiQ's Richard Harker added: "It's not just about meeting legal obligations and getting a tick in the box. QinetiQ has tailored the reporting so that it succinctly illustrates the status of the network and allows informed decisions to be made quickly throughout the management chain."

Results

Since the service went live there have been no recordable breaches of the network – reflecting both QinetiQ's diligence, the hardware measures and the professional network security procedures that SLC has put into place.

While a number of minor incidents have been monitored, none of these have or could have escalated into anything more serious.

MIDS provides SLC with the reassurance that the information it holds is secure and that any would-be abusers would find it impossible to get into the system without detection.

Fraser Harris concluded: "You just cannot sit back and become complacent when it comes to security and recently we bought in an independent third party to undertake penetration testing. Not only was this attack immediately recognised by our MIDS, preventing access, it also correctly deduced the nature and source of the 'simulated' attempt at defeating our security.

QinetiQ Solutions

Managed Intrusion Detection Services
Our 24x7 Managed Intrusion Detection Service (MIDS) can monitor any sensor or device for co-ordinated risk mitigation and attack response.

Key features of QinetiQ MIDS include:
- *15 minute response time to business critical events*
- *High availability service where required (99.995%)*
- *Global service capability*
- *Device agnostic monitoring capability*
- *21 day customer tuning period*
- *Tailored response programme*
- *Expert event analysis*

In addition to immediate alerting of high severity events by phone, along with formal close-out, 12 hour reports are available as encrypted email or through a secure web portal. Reporting in graphical and tabular representations are obtainable with daily, weekly and monthly summaries of attack statistics by type, source and domain.

QinetiQ does not manufacture intrusion detection or firewall technologies; we focus on the integration and support of standard and disparate technologies to provide more effective event response and improved protection of investments already made.

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Quantitative Marketing Effectiveness

Measuring the relationship between marketing activities and the actual returns they bring has traditionally been hugely imprecise. For a major retail finance organisation, ambiguity is now a thing of the past.

Key Benefits

- *Identified a 30% saving from the TV media budget - equivalent to over 15% of the total budget.*
- *Highlighted that two advertising campaigns had been completely ineffective.*
- *The client's marketing director was able to differentiate the effectiveness of advertising across media types.*
- *The client was able to build a quantitative model of the business and identify the important factors that truly influenced sales.*

Background

Capturing the effectiveness of marketing activity is key to justifying budgets, increasing profits and producing realistic future plans.

In today's business environment it is becoming increasingly important to:

- capture market share
- retain customers
- acquire new business
- increase sales from existing clients.

Businesses aim to solve these problems by investing in the most efficient combination of marketing media. A constant frustration for marketing directors is the knowledge that some of their investments are wasted - but they do not know which.

QinetiQ is in discussions with a number of global clients who are interested in how they can optimise their marketing activities. These clients include major financial institutions and FTSE 100 retail organisations. An example of one of our clients is a key retail and finance organisation, with over 50,000 employees. With advertising spend at over £50M per annum, the client focuses its marketing activities at both B2B and B2C audiences from more than 2,000 branches and contact centres across the UK.

Existing analysis techniques enable clients to identify uplifts as a result of specific campaigns but many are unable to separate out the effectiveness of different media, or to use that information to optimise their media planning to boost future returns

Challenge

Like most commercial organisations, our client sought to optimise future marketing investments to maximise returns and ensure penetration at the right levels within different media channels. Considerable effort and investment goes into increasing market share.

The financial director instructed his customer management team to justify and demonstrate the effectiveness of the company's marketing activities. The problems facing the customer management team therefore included:

- justifying past investments made in marketing campaigns;
- developing a case for obtaining the desired budget for future marketing investments;
- maximising the return on future marketing investment.

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Solution

QinetiQ's team of analysts worked with the client to develop a robust and accurate model of the business that showed how the market responded to particular marketing activities.

Starting with the client's marketing strategy and spend, QinetiQ applied a combination of rigorous analysis and proprietary software to separate out the individual effects of different media. These market responses were built into a model providing the client with a new dimension of insight into the market's behaviour to each activity over time. Using this model, the team worked with the client to identify non-marketing activities that had an effect on response. Those factors included the impact of internal operational decision and activities, as well as external events.

Benefits

In just six weeks, QinetiQ identified a 30 per cent saving from the TV media budget - equivalent to more than 15 per cent of the total spend - and improved the efficiency of the client's marketing by proving that two advertising campaigns had been completely ineffective.

This level of accuracy and rigour, resulted in a thorough analysis of the client's business.

The client's need for insight into the impact of marketing was further satisfied by identifying a maximum "Share of Voice", above which further TV advertising coverage maintained brand but did not lead to increased sales.

QinetiQ's specialists' experience and knowledge, added a third dimension of insight into the marketing model so that the client was then able to differentiate the effectiveness of advertising across all media types. QinetiQ identified factors outside the TV advertising and marketing focus that influenced acquisitions, including the effects of internal operating decisions, the effects of external occurrences outside our client's control, and errors in reporting that showed incorrect information about the client's business.

QinetiQ was able to build a quantitative model of the client's business and identify the important factors that truly influenced sales.

QinetiQ Solutions

Craft - a revolution in quantitative marketing.
Craft is a comprehensive service including data auditing, technical and management consultancy.

Using technology derived from QinetiQ's work in sonar detection - which uniquely identifies vessels on and below the sea surface using advanced noise reduction and signal separation techniques - Craft is able to distinguish the effect of individual elements of the company's marketing mix across many variables and information feeds.

Craft uses data specific to a business to develop a quantitative model detailing how the market responds over time. This provides an auditable analysis of the performance of previous campaigns and the ability to learn from the past to forecast, and therefore optimise, future investments. Craft can:

- *forecast realistic sales volumes and provide sales-based strategic planning to determine how to achieve maximum impact with minimum spend*
- *quantify the effects of internal operating decisions*
- *quantify the effects of external events (outside the client's control)*
- *identify errors in reporting (that result in incorrect information about the business)*
- *enable informed decisions for future investments*
- *improve marketing effectiveness to increase profitability*

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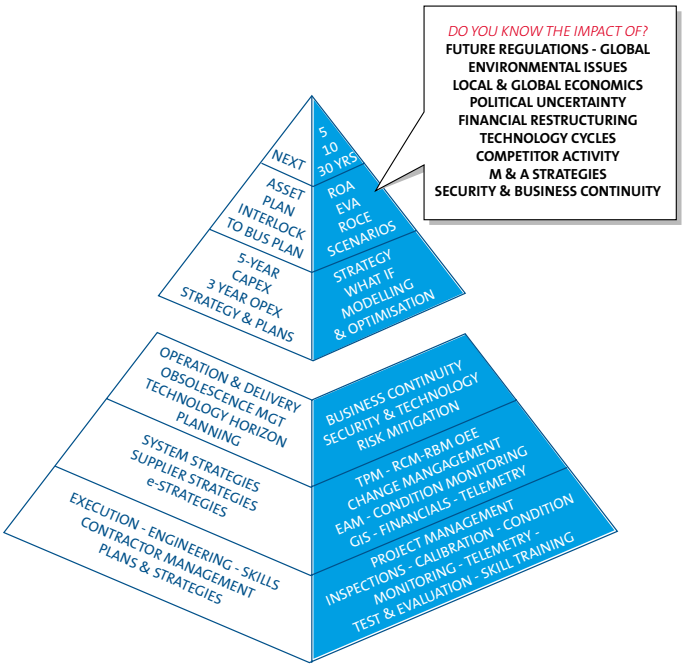
SUSTAIN®ing your Competitive Advantage in your Industry

The current challenges facing many boards within asset and infrastructure-intensive businesses are huge and diverse. They can include financial restructuring, mergers and acquisitions and the need to balance market growth strategies against funding constraints and long-term planning of strategic assets in an environment where there is accelerated asset obsolescence technology and market dynamics.

Arguably these issues have always been a factor but, with the pace of change in today's business environment increasing, CEO's and their boards are often left struggling to keep pace.

Add the fact that executives responsible for long-term planning face factors outside their control, the case for seeking out expertise in a variety of business areas has probably never been greater. These factors include:

- competitor activity
- step changes in technology
- economic uncertainty and changes in the global trade landscape
- asset security issues in the new world environment as well as
- future regulations and environmental responsibilities (as required, for example, by the Turnbull Report on corporate governance)



QinetiQ's Consultancy Division, vastly experienced in government and institutional planning, has now turned its attention to the commercial world.

The company has developed and launched SUSTAIN®, a new suite of business analysis methods and tools, to improve the sustainability and profitability of asset-intensive businesses.

For the first time, a blend of consulting and business skills have been brought together with access to the largest European base of world-class experts and the technology to create a package that is faster and more flexible than anything else in the market place.

What makes SUSTAIN® different?

Many systems require large quantities of detailed financial and engineering data to generate anything useful. SUSTAIN® can capture the client's domain and business knowledge coupled with QinetiQ's focused market intelligence to rapidly generate meaningful business strategies, adding real value without the need for masses of

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data. It means rather than facing a delay while data is collated or accumulated, QinetiQ's team is able to start at once, generating competitive advantage in fast moving environments.

These initial solutions can, over time, be refined to incorporate proprietary data provided by the client. Where a company's data has been used to refine and validate QinetiQ's initial models, the accuracy has been excellent - typical variance is between five to ten per cent.

With SUSTAIN® the process is so quick and interactive that QinetiQ is able to agree an exit strategy up-front so that once the clients have mastered the necessary techniques; they are empowered to go forward on their own. It means the QinetiQ team are always on hand when necessary but they do not overstay their welcome.

The other major difference between SUSTAIN® and conventional consultancy models is that QinetiQ is able to form a bridge between worlds as diverse as engineering and finance.

SUSTAIN® has been used commercially for more than two years and already it is making a difference in industries as diverse as retail, utilities, transport and defence where infrastructure is highly asset intensive.

QinetiQ's unique methods, tools and approaches are now being used to help senior executives understand the dynamics of their companies and forecast the future. Additionally it is assisting organisations in complex long-term CAPEX and OPEX (capital and operational expenditure) planning or to understand the quality and completeness of information that is available within their organisation.

Our experience can assist executives in unlocking an organisation's domain and intellectual capital in an easily usable and predictive form for strategic decision-making. This allows organisations to get sight of often hidden warning signs of opportunities and problems, thus allowing action to take advantage of the situation.

QinetiQ's approach to risk management and business continuity is founded on the company's world-leading expertise in strategic security analysis and technology insight. Our advanced scenario development toolkit can rapidly develop a number of pragmatic scenarios, which are then refined in discussion with the client. Detailed analysis is then carried out to specify the range of potential risks against the agreed scenarios, estimate the likelihood of occurrence, quantify financial impacts in terms of revenue, capital and contingent liabilities, and identify mitigation strategies.

Implementing these strategies typically generates a number of initiatives across the business but in the past these have been planned and executed in isolation, leading perhaps to a lack of co-ordination, reduced benefits and unnecessary additional costs. QinetiQ's systematic approach overcomes this and typically produces substantial savings, and a reduction of the overall project risk.

SUSTAIN® has a wide range of business and engineering analysis methods for supporting the development of a strategic asset management policy. This enhances the effectiveness of the whole business - improving asset productivity, minimising business lost due to asset failure and maximising long-term profitability. It cuts across CAPEX/OPEX silos within organisations, relating asset management activities to business goals.

QinetiQ has experience in working with clients to solve different issues in their business. Recent projects include:

- **Business Performance Analysis** - powerful reliability trending analysis and cost modelling to identify improvements (e.g. asset investments or changes in maintenance policy) that have the potential to transform business performance

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- **LAMP™** (Lifecycle Asset Management Planning) - state-of-the-art 'what-if?' modelling techniques to predict the consequences of alternative combinations of proposed improvements
- **Operations & Maintenance Planning** - used in conjunction with LAMP™ to identify the day-to-day maintenance programme associated with alternative policies
- **Exploratory data analysis** - fully exploits client's existing information to solve an urgent problem using revolutionary technologies

All too often, data can be collected without an understanding of what it is to be used for, whilst existing data lies unused. QinetiQ's top-down approach to decision support starts from the needs of the business, identifies what decisions need to be taken and when, and defines the procedures, tools and data required to support those decisions. Sensitivity analysis is used to quantify the value to the business of collecting different types of data. The result is a decision support process honed to the needs of the business and an end to poorly targeted and expensive data collection.

SUSTAIN® solution programmes are partnerships between the expertise of the client and the QinetiQ consultants supported by market leading technology solutions. This leads to competitive advantage, added value services and regulatory compliance where appropriate.

W.T. "JOCK" KUTYLOWSKI

Business Manager "Strategic Asset Management"
QinetiQ Consulting

Jock joined QinetiQ recently to head up the Strategic Asset Management Group. He is responsible for the provision of consultancy services and solutions to commercial clients in the utilities telco and transport sectors in support of Strategic Asset Management solutions.

Prior to joining QinetiQ Jock has 18 years commercial, consulting, and engineering experience in a number of Asset Management organisations. He ran a USA Asset Management Software company and has worked on projects with Asset Intensive Industries such as Thames Water, T Mobile, BT, BP, London Underground, Heathrow Express

Helping to make our food safer – and save money

Technical Business

Dominic Walker, Senior Application Scientist, QinetiQ

Food preparation is a multi-million pound business but, even using the latest industry detection techniques, pre-prepared items such as sandwiches, ready meals and sliced cold meats are still susceptible to the accidental inclusion of unwanted (foreign) objects at some stage of their preparation.

The problem is growing and with companies facing bad publicity, potential law suits and, at worst, a serious incident that could potentially cripple them, something needs to be done. QinetiQ scientists have looked at the techniques already being employed by the food industry and are now investigating ways of using the company's novel, hi-tech detection and processing techniques to tackle the problem – the potential savings could be vast

Further insights on the issues associated with Asset tracking through technology, such as RFID, has been provided from leading industry players. Accenture and IBM have written papers on the successful deployment of such an approach in your business and QinetiQ Executive Perspectives are delighted we can make them available to you.

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High performance. Delivered.

Fish & Chips

Technical Business

Glover Ferguson, Chief Scientist, Accenture

When the subject is e-commerce, the talk is likely to be about, well, talk—about how people communicate. Whatever the means of communication, a person is doing the communicating. But now another form of communication is quietly taking hold. This time objects are doing the talking—to people and even to other objects.

This is the basis of the silent commerce that takes place without human intervention. By making objects of all sorts both intelligent and interactive, silent commerce opens up business opportunities and the possibility of new business models.

IBM

Tagging the future

Technical Business

John A Wolff, Programme Director e-commerce, IBM

During the past decade, supply chain management has seen a complete overhaul of traditional logistics procedures as tight integration between warehouse, distribution and retail have smoothed out duplication and improved time to market. However, further improvements have been constrained by the technology used to track goods through the supply chain.

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EXECUTIVE Perspectives

From innovative metal printing technology to using underwater technology to bring new applications to mobile phones, we bring you news of how QinetiQ is changing our world.

The metal greenhouse

Some of the world's greatest inventions started in the most unlikely of places, and the technology behind QinetiQ's Metal Printing group (QMP) is no exception.

QMP owns a process that enables pure metal to be grown onto both rigid and flexible substrates, using innovative inks and an electroless deposition process.

"The technology is home-grown in every sense – QinetiQ's first success in growing metal was achieved using a beaker, an adapted ink pen and sheet of substrate in an office", explains, QMP Director Chris Bishop.

Origins

The breakthrough came in December 2000 during research into materials for defence applications by the Signature Materials Group, which is based at Farnborough. "We recognised that there was a niche in the market for a low-cost, flexible, scalable solution that was simple to implement and that could replace etch-resist applications", says Chris.

From these embryonic beginnings it was recognised that the technology could have a significant impact on a number of industries, not least the retail industry, where the QMP process is ideally suited for use in the manufacture of low-cost radio frequency identification (RFID) tags.

In August 2001, the team presented a business case to the QinetiQ Board, which approved its plans for a new venture and QMP officially launched in February 2002. By August of that year, the QMP facility was producing materials for defence applications and RFID tags.

A fine process

One of the benefits of the QMP process is its simplicity. Customers can use any printing process with the QMP inks to print their desired pattern on to a substrate. The substrate is then immersed into an electroless bath containing the metal, usually copper, which grows on to and through the surface of the substrate where the ink is printed. An important characteristic of the QMP process is that the printed metals retain their original radio frequency and electrical properties.

"The use of an innovative ink is fundamental to our application and forms the core technology behind our process and, as such, is a valuable component in our intellectual property portfolio," says Chris.

The benefits of using the QMP process over and above traditional Etch Processes include:

- *dramatic reduction in manufacturing cost for such items as RFID tags and Antennae. The typical saving is in the order of 50% over traditional etch processes*
- *increased processing speed, greater flexibility and versatility*
- *reduced operating capital and equipment costs*
- *environmentally friendly process does not use Chromic Acid and therefore meets emerging legislation.*

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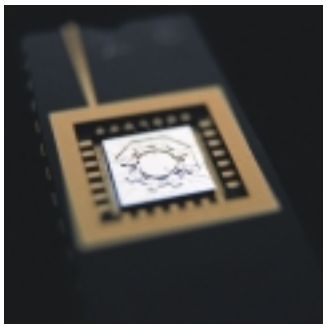
The use of innovative inks and industry standard electroless chemical solutions allows a range of metals and most rigid and flexible substrates to be used with the QMP process. "The range of metals and substrates supported increases monthly and includes copper, nickel, cobalt, magnetic materials, alloys and synthetic paper, polyester, polypropylene, polyimide and glass substrates," says Chris.

The composition of the QMP inks affords the customer greater flexibility in choosing the most appropriate printing method and, unlike etch-resist processes, the use of non-toxic chemicals in the QMP process provides an environmentally safe alternative.



Because the process is an additive one, ie growing metal as opposed to the traditional method of etching it, much less is used and the wastage is kept to a minimum. Etching produces contaminated metal by-products, while the QMP process does not. In fact, the QMP waste is estimated to be up to 99 per cent less than conventional etching methods.

"Commercial customers and other QinetiQ business groups have approached us with a variety of problems relating to the printing of metal patterns on to obscure surfaces and materials, which has tested our inventiveness and assisted us in defining new and innovative approaches for developing QMP further", explains Chris.

Playing tag

QMP's current focus is the RFID tagging market. These tags consist of an antenna and, in some cases, a microchip. When attached to goods or packaging, they can tell you where those goods are in the supply chain. For example, if these tags are attached to packages that are loaded on to pallets, they can be scanned every time they pass a reader. This can happen when they leave the warehouse and enter the customer's premises, thus adding value to supply chain management and providing a level of protection from thefts and counterfeits.

One of the main hurdles facing the mass-market adoption of RFID devices is the cost of manufacturing the tags. A key component in this process is the construction of the antenna, which is typically produced using the etch-resist process. It is this process in the manufacture of the RFID tags that QMP is focused on replacing.

"We have proven our ability to significantly reduce the cost of manufacturing antennas on a variety of tags," explains Chris.

The QMP goal is to reduce the cost of manufacturing tags down to levels that drive market acceptance by suppliers, manufacturers and commerce and to be the dominant process for the manufacture of RFID antennas.

Blooming future

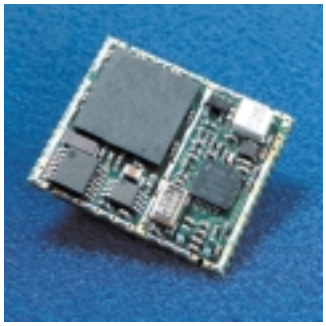
It seems that once the cost of manufacturing reaches the required levels, QMP will be in the enviable position of being able to license its flexible process to a hungry market which is estimated to reach 300 billion RFID tags by 2010, with a market potential of $4.8 billion.

The QMP technology also has other applications – including smart labels and packaging, magnetic tags and frequency selective surfaces (FSS).

FSS can be used to provide a screen for certain signals, a technology that would be very useful in hospitals to filter out mobile phone frequencies, ensuring that emergency frequencies are not interrupted. There have even been discussions regarding the application of this screening technique in schools to prevent students from using mobile phones in class.

The 'metal greenhouse' has come a long way from its conceptual discussions – it now looks set to go global.

QinetiQ and Sepura: pushing the boundaries of GPS



Sepura, one of the world's leading and most innovative TETRA suppliers, has become the first company to benefit from QinetiQ's Low Signal Strength (LSS) GPS module. Sepura has integrated the QinetiQ LSS GPS module into its SRP2000 sGPS TETRA handportable radio, as used by the emergency services. The QinetiQ LSS GPS module operates in extremely low signal environments so for the first time it is possible to gather position data within urban canyons, such as city centres, and even inside some buildings. It also provides unrivalled levels of integrity, continuity and availability, essential for mission critical systems in the emergency services and in public service applications. The Low Signal Strength module is at the core of QinetiQ's Positioning Development Platform being developed in a modular, configurable way to reduce cost and time to market for partners and solutions providers.

Panoramic pictures for your mobile phone

Technology developed for the Royal Navy as an underwater navigation software tool is now interesting several of the major mobile phone handset manufacturers. Unlike traditional photo stitching methods, QinetiQ's automated 'single-click' process discards all redundant information and produces images that are free from lighting variations and blurred artefacts caused by people or objects moving in the field of view. The images can then either be displayed on the phone or printed on paper using a roll capable printer. QinetiQ, in technology co-operation with EMCC Software Limited, used the 3GSM event in Cannes this February to demonstrate its real-time video mosaicing capabilities for Symbian OS-based mobile devices. And there are other innovations on the way as well...

NAB 2004 provides Skylink with its US debut

The BBC has already used Skylink – the world's first video relay service to operate at 30,000 feet – during the World Rally Championships, with live in-car footage of Petter Solberg's title-clinching victory in the Wales Rally GB broadcast around the globe. Other notable successes includes cycling's Tour de Suisse and the Zurich Grand Prix. The company is trialling Skylink during the world-famous London Marathon with a view to adopting the system as its official video relay service. Skylink's obvious advantages, where one fixed-wing aircraft can do the work of seven helicopters better and more cost-effectively, is well known in Europe. Now, for the first time, America is about to see what a unique partnership of expertise in broadcast, aviation and radar, has to offer.

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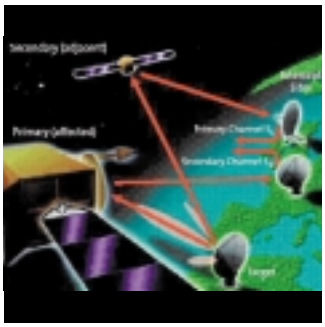
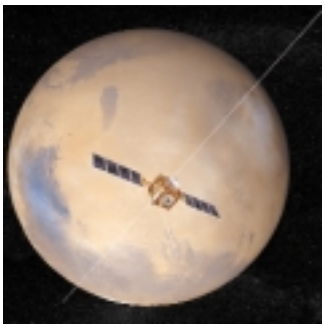
Leading the fight against satellite jammers



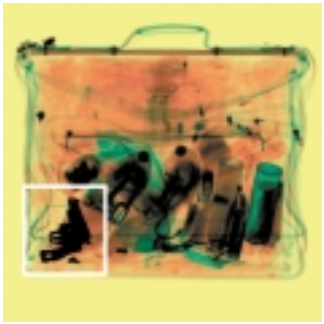
Evil villains jamming TV signals, taking over the airways and holding a nation to ransom in blockbuster movies like James Bond are no longer just fiction. During the last football World Cup, cult group Falon Gong jammed Chinese TV broadcasts over the Sino satellite. More recently, Voice of America broadcasts were blocked from being transmitted into the Middle East. Business and consumers rely increasingly on satellites to provide instant global coverage for e-commerce transactions. Satellite television stations want to broadcast news and TV programmes to a global audience. Now QinetiQ is coming to the rescue, helping governments and commercial satellite operators alike, in the global fight against jamming.

QinetiQ communication system links to surface of Mars



A double first has been recorded by the communications system designed and built by QinetiQ for the European Space Agency's Mars Express orbiter. It has been used in a successful joint communications demonstration between the orbiter and NASA's Spirit rover. Mars Express made an overflight of Spirit on the Martian surface in February, when commands were successfully transferred to the rover and data was received by the orbiter. QinetiQ's Melacom communications system enabled the orbiter to act as a data relay satellite for the lander on the surface of Mars. This was the first time there had been an in-orbit communication between an ESA and NASA spacecraft, and also the first working international communications network around another planet.

Highlighting air travel threats



The physical screening of passengers and luggage at airports is one of the most effective ways of preventing weapons and explosives getting on to aircraft, but the task is extremely difficult. British airports are successfully using QinetiQ's Threat Image Projection software, which superimposes fake images of objects such as guns on to real X-ray scans in order to improve the effectiveness of the security screening personnel.

Nature's website recently reported that human error in X-ray screening at Washington Dulles airport was probably responsible for allowing a man to carrying bullets to board a flight to London and that the ammunition was only discovered when his coat went through the hand baggage X-ray at Heathrow.

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Technology Watch

QinetiQ

If it is quirky or simply amazing, we spotlight leading-edge technology innovation from around the globe. Read why you should never be 'sniffy' about e-mail again

UK net provider Telewest Broadband is testing a system to let people send aromatic e-mails over the internet. The BBC and New Scientist websites report the development of a kind of hi-tech air freshener that plugs into a PC and sprays a smell linked to the message. The cartridge contains 20 basic aromas, which can be combined to produce up to 60 different smells under control from the PC.

A chip that blocks a reader from identifying items tagged with unique electronic codes may help allay the public's privacy fears over radio frequency identification (RFID) technology. A report on the New Scientist website says the silicon chip RFID blocker tag has been developed at RSA Laboratories in Bedford, Massachusetts. Privacy concerns have so far stalled the widespread adoption of RFID tags but RSA believes the blocker will make them more acceptable.

A new low-profile antenna can track a geo-stationary satellite from a moving passenger vehicle. According to e4engineering.com, it integrates into the vehicle roof for the first time without affecting headroom or modifying the vehicle's contours. The beam steering is mechanical rather than electronic, but developer Delphi says that this does not add any perceptible noise into the passenger compartment or electromagnetic interference to other vehicle systems.

Mobile phones pose no increased risk of brain tumours – at least not for the first 10 years of use – according to new research. Newscientist.com reports the two-year study, organised by the International Agency for Research on Cancer (IARC), examined every new case of a rare acoustic neuroma brain tumour in Denmark's 5.3 million population. Comparison with a matched control group showed no correlation between tumour incidence and mobile phone use.

Two unglamorous technologies – web services and grid computing – are driving the latest visionary research in IBM, Microsoft, HP and the other large IT companies, according to the Economist website. Web services is software on a big shared "server" computer that can be found and used by applications on other servers, even those belonging to different organisations, while grid computing involves the sharing of processing power, possibly using computers world-wide to crunch data.

New machine-to-machine communications – so-called Web services – are quietly reshaping the way business is done. First generation e-commerce proved disappointing, says a report on the spectrum.ieee.org website. In the US in 2002, e-commerce accounted for only 3.2 per cent of all transactions. Second-generation e-commerce, however, is unlocking the value of data using web services to link databases across the internet and to automatically put together optimised services for customers.

Future cellular telephones and other wireless communication devices are expected to be much more versatile. Eurekalert.org says programmable networks will include location-aware services that will allow users to choose a variety of "context aware" call processing options, depending on where they are and who they are with. Within organisations, these capabilities might be used to contact people by their role and location.

Hand-held mobile devices look bound to become the way of the future for retail shoppers if some current field tests are any indication. One prototype PDA interacts with a retail store's computer system to locate items, offer information about special promotions, and speed purchasing time. Optimizemag.com reports that the prototypes were developed by researchers at Georgia Institute of Technology.

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EXECUTIVE Perspectives

The most flexible electronic display yet developed has been revealed by electronics giant Philips. New Scientist says the company will begin mass-producing such displays within a few years. There are many projects aiming to develop "electronic paper". Such a display could, for example, be used to create a fully updatable newspaper which could be rolled up into a coat pocket. Flexible displays could also be used to create new mobile phones and other collapsible gadgets.

The Intel Corporation of Santa Clara, California, is moving into home entertainment with a chip which will dramatically reduce the cost of big-screen televisions. The company has announced that it will start selling liquid crystal on silicon (LCOS) chips later this year. According to an e4engineering website report, the LCOS chips will be used to create microdisplays for rear-projection TVs, allowing manufacturers to sell 50-inch high-definition television sets for less than US $1800.

The entire functions of a radar system have been squeezed on to a single silicon chip about one fifteenth the size of a penny by researchers at the California Institute of Technology in Pasadena. Radar sensors could now become cost effective to use in cars as obstacle sensors and parking aids. New Scientist reports the chip, which radiates at 24 GHz, could also be used for communications.

Biannual UK government survey has found that 93 per cent of UK businesses, and 99 per cent of large companies, now use anti-virus software, with almost 60 per cent updating their protection automatically to guard against new threats. Despite this, the BBC reports half of all firms, and 68 per cent of large companies, were damaged by viruses during 2003 – particularly by the Blaster worm.

Future UK passports will contain a biometric chip. Initially this will hold a digitised photo of the passport holder and a digitised signature of the passport agency in order to prevent counterfeiting. One other biometric identifier, iris pattern or fingerprints, will also eventually be stored on the chip. The BBC's website reports trials are underway in the UK to decide which one to use.

Intelligence in the workplace is not that different from intelligence at school, according to the results of an American meta-analysis of studies involving more than 20,000 people. The report on the eurekalert.org website says the findings contradict the popular notion that abilities required for success in the real world differ greatly from those needed in the classroom.

A chip war is brewing up between Intel, the world's largest chip-maker, and Advanced Micro Devices (AMD), its smaller rival. The Economist reports computer maker Hewlett-Packard, a close ally of Intel, has said it will use AMD's Opteron processor chip in a new line of powerful server computers. The news came just days after Intel unveiled a new version of its Xeon chip, which mimics features of the Opteron.

Successful supply-chain and asset management requires a broad view of the entire network of partners and consumers, as well as a clear window into the location of all assets at any given time. Optimize.com reports how Proctor & Gamble is implementing a new vision in commercial and defence applications which requires the right technology, open standards and real-time data.

Press-to-talk mobile phone services, which work like a walkie-talkie and are popular in the US, have been introduced into Europe. Orange's Talk Now offering will let users chat by simply pushing a button, rather than dialling. The New Scientist website reports that because they allow immediate one-way-at-a-time contact they can be useful for managing teams of people in real time.

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