Brand©

Protection and Promotion World

News

Reports

Brand© is published 10 times a year. Each issue includes consultancy-level articles that provide independent analysis of a variety of disruptive, emerging technologies that are gradually being incorporated by the world's leading brands. Each e-journal also provides exclusive reporting of latest material and product launches, trials and breakthroughs.

RFID growth in China provides assurances and opportunities

A strategic partnership between *Alien Technology* and *Digital China* to increase RFID sales in the People's Republic reflects the need to meet China's rapid growth for RFID services.

The partnership will enable both companies to serve a wider variety of markets including supply chain, animal-tracking, anti-counterfeiting, food safety, power meters, tobacco, alcohol, apparel and pharmaceutical.

China has both the largest population and the largest consumer market in the world, as well as being the largest manufacturing centre.

The use of RFID in supply chain management, moreover, allows both domestic and foreign brands operating in China to achieve real-time track-and-trace information for the whole lifecycle of their products; providing themselves, law enforcement agencies, and even their customers a convenient channel to authenticate products.

The Chinese government has been investing heavily in RFID, and plans to use it in healthcare and national identification cards, as well as opening and funding research centres in Hong Kong and China.

Premier Wen Jiabao has been instrumental in pushing the Internet of Things (IoT), with RFID being one of the cornerstones of this policy.

The rapid development of the Chinese RFID market owes as much to the stimulation by the Chinese government as it does to the fact the original market was quite small, providing plenty of opportunities for growth.

According to market research firm *iSuppli*, China's RFID market is set to double by 2014 and includes tags, readers and software/middleware. It is estimated to have grown to $1.4 billion (€1.1 billion) in 2010, up 22% from $1.1 billion in 2009. By 2014, the RFID market will reach $2.4 billion – more than double the total from 2009.

RFID technology has been used to prevent the counterfeiting of electronic admission tickets for the *Beijing 2008 Olympic Games*, China's National Games and the *Shanghai World Expo*. RFID has also been used to protect Chinese liquor and tobacco.

Having rejected EPC Gen 2 *standards* owing to royalty constraints, China appears to be developing its own RFID standards, which could have a far-reaching impact on its development and uptake, in both China and beyond.

Integration of RFID is taking place at some of the biggest organisations in China. Telecoms equipment maker *ZTE* has developed an RFID logistics anti-counterfeiting system integrating RF technology, computer network technology, modern telecommunication technology, database technology and software engineering technology. This involves the whole logistics process of products manufactured by enterprises including processing, production, logistics, and consumption.

A ZTE spokesperson says that the company's RFID Logistics Anti-Counterfeiting System only requires small changes on existing production procedures, and forms part of the IT system of an enterprise, with information exchange with other existing IT systems made possible through an open interface.

Multiple inquiry modes are provided including SMS and online, while unique key passwords for each tag provide maximum data security in the tag. Different authorities for different verification users will meet various verification demands.

Increased RFID uptake in China will provide assurances for brands worried about weaknesses in outsourced supply chains, which often result in counterfeited and diverted goods stemming from Chinese operations. The country's appetite for RFID should also present opportunities for technology providers.

Combating counterfeit networking and IT hardware

Networking and IT hardware has become a primary target for counterfeiters, with conservative estimates saying that approximately 10% of all shipments are fake. In 2011, the US *Federal Bureau of Investigation* announced that it had concluded 30 felony convictions, recovering $143 million (€114 million) in devices and the seizure of more than 94,000 counterfeit *Cisco* network elements and labels.

As a result, concern in the US has been generated that counterfeit parts mean information going through networks is not secure.

And news that counterfeit components have found their way into the military supply chain; including night vision sights for weapons, computers, missile interceptors, transport aircraft, helicopters and artillery have helped raise unease.

Ed Thomas, CEO of *Verification Systems Technology* (VST), says the problem stems from authorised and unauthorised channels: 'If you look at the [products] that are highly counterfeited, it is because that they can be bought from a third party, but

Items that can currently be tested with VST Assurance online					
Device	Description	R&D	VST factory testing	VST onsite testing	VST high-volume online testing
SFP GBICs	Cisco compaible 100/1000 base by various vendors, including:				
	● GLC-SX-MM	✓	✓	✓	✓*
	● GLC-LH-SM	✓	✓	✓	✓*
	● GLC-T	✓	✓	✓	✓*
	● SFP-GE-L	✓	✓	✓	✓*
	● SFP-GE-S	✓	✓	✓	✓*
	● SFP-GE-T	✓	✓	✓	✓*
	● And more … From HP, 3Com, Juniper, F5, Brocade, Extreme, Finisar, Force 10, Avago, Methode, Opnext, Foundry, Nortel, Redback, Riverstone, Marconi …				
Switchers and routers	Cisco 375x, 356x and other similar routers from various vendors	✓	✓	✓	TBD*
Disc drives	SeaGate, Western Digital, HP, Oracle …	✓			
X2 and Xenpaks	Cisco compatible	✓			
Other	As defined by the industry alliance	✓			

*Note: * Indicates provided by a VST – Assurance Subscriber or Testing Partner*
Source: VST

built from the same contract manufacturers as Cisco. You can buy the Cisco one in distribution for $300, but buy a third party one for $30. That's the situation, which makes it ripe for counterfeiting, when there are huge price discrepancies. That's when people start getting creative with stickers.'

VST has developed an online tool to identify counterfeit, modified, or stolen hardware says that in the US the largest fear is that.

The current version of the company's online verification tool, VST Assurance, is marketed at end users, resellers and original equipment manufacturers (OEMs). The system performs tests on network gigabit interface cards, one of the most frequently counterfeited devices, used to interconnect network switches and routers prevalent in critical systems.

Thomas says that many other networking and non-networking products will be added to the VST online testing portfolio, including switchers and routers, which he expects to be available for the online service in July 2012.

Customers with an account with VST are able to log in, plug in products like small form-factor pluggable *transceivers* – which can be counterfeited and sold by a third party – and run tests, which take 15 seconds. The system runs a combination of 13 different tests based on industry standards, proprietary VST tests and tests specified by contract manufacturers.

Three clients are now using the system, including *Core 3 Technologies*, and *Teksavers*, both independent IT network suppliers of Cisco and *HP* products. Thomas says that a third client has just been brought online.

The company is aiming to have 6-10 clients by July.

Following feedback from VST's first two clients – or 'beta testers' – more features have been added to the system, including the cross-referencing of VST's database for duplicate serial numbers. This helps detect a lot of counterfeit parts and counterfeit trends.

Thomas explains: 'If we spot a trend for a large number of a certain duplicate serial number we know something is wrong, and contact both law enforcement and the contract manufacturer.'

He believes that some companies put too much of their brand protection energies into ensuring that all deals and orders are put through authorised channels, without doing anything to shut down or to stop counterfeit products.

Thomas states: 'Our goal is to make counterfeiting a thing of the past, where anybody can identify it. It's getting to a point where something has to happen. The motivation is between OEMs like Cisco and their contract manufacturers, and when they realise how large the problem is and how much money it is costing them.'

RFID for consumer goods moves beyond track-and-trace

When *Walmart* issued an unprecedented RFID mandate for its top 100 suppliers in 2003, many predicted a flood of similar RFID deployments among the fast-

moving consumer goods (FMCG) markets.

Although several supply chain leaders, including German-based retailer *Metro*, *Tesco*, *Target*, *Gillette* and *Procter & Gamble* followed suit, after nearly 10 years very little of that groundbreaking mandate has become consolidated industry practice.

In 2011 *ABI Research* forecasted a compound annual growth rate of 33% for the global RFID market; with retail/apparel and FMCG predicted to see strong market demand. ABI predicted that retailers and brand owners would realise the added value provided by RFID applications during this period, such as improved control of the supply chain, optimised inventory and replenishment processes, and increased brand protection.

Part of what will make RFID more appealing to businesses in 2012–13 is the extension of its capabilities beyond the track-and-trace functions that, while appealing, have not yet been enough to have a substantial impact on FMCG markets.

To help meet the expected increased near-term demand, *NXP Semiconductors* recently announced a new EPC Gen 2 ultrahigh-frequency (UHF) RFID reader chip, designed specifically for the appliance and FMCG markets.

The SLRC900 chip is a complete system-on-chip solution that includes an EPC Gen 2 UHF RFID transceiver and an integrated microcontroller.

Ralf Kodritsch, head of marketing, tags and labels at NXP Semiconductors, says that NXP is targeting applications, such as printers and its cartridges, beverage dispensing systems and its containers, as well as vacuum cleaners and their bags.

He explains: 'The target application is always an appliance-consumable system, which requires the identification of its disposable or consumable in order to augment product quality, and thereby improve customer satisfaction and experience.'

Kodritsch insists that the times of pure track-and-trace are over: 'RFID has evolved into the next level: be it for inventory control or theft detection in the retail environment, or for brand protection in the area of FMCG and luxury fashion products.

'RFID offers much more than just a product number. Added services in the consumable-appliance, as described, speak for themselves. This can be supported by any technology NXP offers – customers benefit from our multi-apps approach and our leading position in UHF, HF, NFC, and security. With RFID the consumer experience and – equally important – the consumer convenience reach new levels. With a simple tap with a mobile phone one can experience the Internet of things.

'RFID certainly goes beyond brand protection. It adds value in terms of additional services, such as the possibility to read the consumable with a mobile phone

and get additional product information, or get directly connected to the company's website. This all increased the experience with the product and the brand, which subsequently may lead to more loyal customers.'

If a reader chip's microcontroller logged an ink cartridge's tag ID number as that cartridge was inserted, for example, consumers could be assured that it was genuine. The printer could also be designed to alert the consumer if the cartridges were nearly empty or fake.

By enhancing consumers' shopping experience, NXP believes that RFID can boost both vendor and retailer sales. It can also provide fast detection of counterfeited products, provide parallel trading and diversion deterrence, ensure that health and safety standards are met, and provide the ability to void warranty when fake consumables are used in machines.

QR code brand protection developments

A new anti-counterfeit system is due to be released that will trace high-value and luxury products, while simultaneously engaging consumers.

The technology, called Authicode Supreme, retains brand identity by combining with labelling and packaging, and physically numbering an individual product.

1970i is launching the technology to allow consumers to authenticate a product via the brand website, a computer or via a smartphone that can read the dedicated QR code on the packaging.

Ben Muis, business development director of 1970i, says the system aims to provide authentication without impinging on branding design: 'Authicode is a system that can be adapted to the brand, to ensure that the brand can use tickets and labels that convey its own identity.

'The additional functionality in Authicode Supreme now allows consumer interaction in store and also deals with the peer-to-peer resale [*eBay*] functionality. It allows consumers to check before they buy and allows brands to see movement of goods, all at a relatively low overhead.'

Currently being previewed by four brands, Authicode Supreme is also attracting the attention of a number of printing businesses, which are looking to enhance their offering to the packaging industry.

Muis adds: 'Two packaging and labelling companies are previewing with us, to enable them to make use of our technology to supply these brands with the consumables to apply to their products.'

Another brand who has just launched a brand protection solution that includes QR codes is *Applied DNA Sciences* (APDN). In May 2012 APDN launched a DNA-secured form of QR code.

The addition of DNA markers embedded in the ink secures codes from being digitally copied, as well as providing forensic proof of authentication, should it be required.

APDN insists that digitalDNA will deter phishing scams to which non-secure QR codes are notoriously vulnerable, while providing authentication, geo-location and time stamping throughout the supply chain.

While covert protection is familiar to many luxury and high-value goods firms, businesses do not necessarily have the ability to trace this authentication throughout the marketplace.

Because the 1970i team has a fashion industry background, Muis says he can safely say that the Authicode system is geared towards luxury, sports and fashion brands, taking into account the complexities and supply chain challenges of these industry segments.

Muis notes: 'The first issue is visibility. Without seeing, you cannot act. I know of two recent cases where eBay sellers were shut down the moment the brand was informed of suspicious listings. Until they were informed they were not aware and therefore did not act. Most companies do not have a warning system that is visible from head office.'

Authicode is designed to integrate consumer engagement and more conventional protection, while also being easy to implement – brands can include their own favoured packaging suppliers – in order to encourage adoption among luxury goods brands.

Muis comments: 'The mix of obvious protection, traceable products, grey market visibility, customer engagement, and easy use for both supply chain teams and brand-conscious marketing departments, makes it very suitable for the fashion industry, or any other industry that deals with popular and luxury items.'

A new era in digital paper?

The contest between print and digital is one that, in many ways, has made established print firms seek to capture some of the advantages of digital content in printed products. While platforms like quick response (QR) codes have already made progress, a new technology presented by *Ricoh* at print event *drupa* 2012 promises a more sophisticated approach to digital integration.

Ricoh's Clickable Paper technology enables brand owners to offer interactivity to anyone that has a smartphone running either *Apple*'s iOS or the Android operating systems.

The concept includes a mobile app and authoring process that links online content to any segment or 'hotspot' of printed media. The smartphone is pointed at an area of interest, the captured image is recognised, the hotspot is identified and the relevant content is presented to the user.

Graham Moore, business development director for the production printing business group at Ricoh Europe, says that Clickable Paper aims to develop the concept of interactive print products further than its predecessors.

He comments: 'QR codes use 2D barcodes for mobile devices and have been extremely effective. However they do have some limitations. They require the use of large, sometimes obtrusive, pre-printed codes on a page, and just one URL can be used per code. Also the reliability of the QR code scan is highly dependent on both the code's size and print quality.

'By contrast, Clickable Paper does not require any additional pre-printed codes on the page; it recognises images and text that are already in the page design.

It can link to multiple URLs and offer multiple "hotspots" per page. Clickable Paper allows organisations to connect static print content to dynamic online content and modify the URL links at any time after print.'

While still a working concept, Ricoh is now aiming to commercialise of the technology.

Moore says: 'Publishers told us that Clickable Paper is an ideal solution to add value to their books and magazines.

'For example, book covers could link to author-related content that is regularly reviewed to announce details of work in the pipeline, or magazine covers featuring a model wearing certain items of clothing could link to an e-commerce site where they can be purchased – all without the need for an additional QR code.

'We have had a strong level of interest from the packaging community because, just like books and magazines, a greater amount of information can be communicated via the packaging to further develop brand loyalty.

'This could extend into online content, from details on a product's origins, videos of recipes or installation guidelines, to tips on cosmetics application. It could even extend to promotions that cross-market products within brands.'

As a print firm the company is well placed to work with print service users and involve them in the process of connecting their print products with the digital domain.

6CDP's QR codes provides valuable consumer interaction
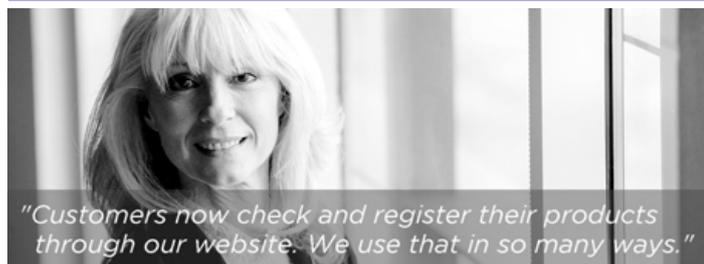
"Customers now check and register their products through our website. We use that in so many ways."

Source: 1970i

RFID and QR codes are increasingly being used to prevent counterfeit clothes from coming to market. Gilly Wright reports

Fake fashion

Fake footwear, apparel and luxury clothing have historically accounted for a large percentage of goods seized by investigative raids and customs inspections. This was confirmed in 2009 by *Havocscope*, which monitors the global black market, and valued counterfeit apparel and luxury goods at $26 billion (€21 billion).

Once almost exclusively a problem for luxury brands, there are now increased incidents of counterfeits of lower value, high-volume fashion items coming to the marketplace.

Figure 1
RFID provides visibility throughout the entire supply chain for apparel
Source: Salpomec

Jarkko Kuusisto, CEO at *Salpomec*, a Finnish company providing logistic solutions for the garment industry, says the problem is increasing all the time and presents very real problems for smaller, low-cost brands.

'In the past, counterfeiting was a problem mainly for major luxury brands. The counterfeit products were often of low quality and could be seen to be a fake on closer examination,' he comments.

'Unfortunately, counterfeiting is an immense business today. Fakes are produced for any kind of products that sell. High-volume fashion stores are now being copied as well. And people are not expecting the everyday brands to be fake. The Internet has also made it easier to sell fake products.

'More companies will be facing the problem. This will happen to less expensive and smaller brands that are also not as well equipped to face the problem.'

Counterfeiters are now more likely to target leading brands and labels, rather than high-priced luxury products, which occupy a niche – albeit a lucrative one.

'Counterfeiting is no longer about targeting luxury, high-priced brands; it's very much about targeting leading market brands in each sector, such as, jeans, handbags, accessories and so on. If you are number one or number two in a market, then you are going to be targeted,' says Ian Lancaster, managing director of authentication consultancy *Reconnaissance International*.

Ben Muis, a consultant to the fashion industry and business development director of *1970i*, which provides hosted software solutions and

> **Unfortunately, counterfeiting is an immense business today. Fakes are produced for any kind of products that sell. High-volume fashion stores are now being copied as well**

support for the fashion industry, agrees that if a brand is popular, it becomes vulnerable.

'I see this on a regular basis when consulting for brands in different market segments. From luxury goods to trending brands, and niche items such as Scottish kilts, they all have counterfeit and grey market issues,' he says.

Multiple choices

In an industry where nearly 98% of all products are manufactured overseas, leakages across the global supply chain are to be expected, especially when you consider third shift activity and the potential for diverted product sales.

'The problem for the fashion industry is the amount of subcontracting of the actual making of things and the loss of control that this can bring with it,' states Lancaster.

'Having said that, it is an industry that takes steps to protect its names and its brands.'

As to what anti-counterfeit measures fashion brands deploy, there has never been so much choice. Lancaster advocates the need for combining different technologies and approaches to combat counterfeiting.

'I would strongly argue for combining an overt technology, such as a hologram, with a covert technology, such as a hidden image or RFID, with a tracking technology or datamatrix. The combination, or layering, is always the most effective way.

'The reason for including an overt technology is to involve customers, to let them know that an item is genuine and not counterfeit. Tracking shows that a product is where it should be and is what it should be.'

Lancaster sees no difference between the luxury and lower cost brands, other than the cost of implementation.

'Every case that has ever been studied shows that the cost of implementation is more than outweighed by the returns gained; savings from the cost of fake goods and the savings cost from reclaiming market share,' he adds.

Technology advances are broadening the tools available to brands and companies, some of which can make it more cost-effective to implement brand protection.

Kuusisto at Salpomec notes the progress in RFID: 'It is up to them if they choose to use them. I am a big believer in RFID. I may be a bit partial though, since I have been involved with RFID for nearly 20 years.'

With counterfeiting edging into more mid-range markets, small and medium-sized companies should accelerate their protection and RFID projects to be ready.

'The cost of technology is no longer an issue and the payback time with today's cost level is very quick. It is no longer needed to test the solution. It works,' Kuusisto adds.

'Getting an RFID solution is very easy these days. You just need to contact a company like us and tell us what you want. You can buy the system, lease it or get it as a cloud service. You can start with just one product group or store, or have the system fitted for the whole supply chain immediately. It just takes the management commitment.'

Salpomec has set up several RFID equipped systems in the garment rental and laundry industry since the early 90s. Although counterfeiting is not that big of an issue, both industries use RFID to track garments through the entire process and for sorting purposes.

Kuusisto believes the fashion industry has been slow to adopt RFID, meaning few businesses are seeing the benefits. Most of the activity among smaller brands has consisted of pilot projects.

'Companies with the control over the complete supply chain are moving ahead fastest and are gaining the most. Today, the supply chain in fashion is very fast-paced and global. Garments are shipped to our clients' distribution centres from all parts of the globe,' he adds.

'Using RFID technology, each product receives a unique tag, with unique information, at the very beginning of the supply chain. We know

instantly, from the tag information, what has been manufactured, where it is and when it is being shipped. These tags are active until the customer purchases the garment in the retail store, or even longer for possible returns.'

While commercial progress in the garments industries has so far been relatively modest, RFID is well suited to these applications. The fast-paced nature of fashion requires good visibility of the complete supply chain. Using RFID, businesses can gather vital information on stock and sales across sizes, colours, and products. Stock can be replenished using data gathered by the RFID system, providing an inventory and updating orders via the distribution centre daily.

Kuusisto notes: 'Consumers today expect to have the clothes they see in magazines in the stores today. They need the right style, colour, and size to be available. If it is not available from one store, they can easily go to the store next door.'

Marketing info

One trend that will aid the progress of brand protection technology in fashion is the ubiquity of smartphones among the customer base. Although they are not yet established tools for widespread authentication, QR codes will be exploited as anti-counterfeiting becomes more important for brand owners.

'QR codes are one of the ways companies can reach out to their customers, and provide additional information and authenticity for their products. The codes also provide a way to promote brand loyalty and for brands to provide easy access for more information about the company webpage, view promotional videos, and social networking sites,' Kuusisto adds.

Six Degrees Counterfeit Prevention (6DCP) offers a non-mathematical encrypted anti-counterfeit solution, and CEO Eddie Cohen says one code can serve multiple purposes: counterfeit and grey market detection, track-and-trace, and marketing acceleration to the end user

'We are also the only service around that can encrypt – with the world's only polymorphic, non-mathematical encryption – an entire database record into a 2D barcode. The driving force behind our solution is the encryption,' he explains.

The company boasts of encryption stronger than that used by the military, combined with the fact that the upfront cost for procuring, maintaining and securing a database infrastructure is eliminated.

Importantly the technology allows for the same data to be encrypted as both a QR code and printed as an RFID.

'Companies can benefit from the inventory management capabilities of an RFID while at the same time allow for "million eyes inspector" – the ability for a consumer with any free 2D barcode reading app installed on virtually any phone to verify the authenticity of a product,' says Cohen.

Consumer power

6DCP's million eyes inspector concept hints at a wider trend in brand protection to allow the customer to play a role in authentication – something that RFID cannot do.

'Unless you're a corporate investigator, customs agent or other agent equipped with a special reader – that most likely costs a lot of money – covert features are useless to the consumer,' Cohen argues.

'By encrypting data into a QR code, we create a truly unique identifier for each item that is produced. This creates differentiation from, say one pair of jeans to the other – from the same cut, style and so on. This "digital DNA" of sorts puts the power in the consumer's hand to verify the authenticity of a product. The QR code can easily be printed or heat-pressed onto a care tag or label.'

As so many people have a cameraphone, Cohen insists that 6DCP's solution engages consumers in a new way, creating market acceleration opportunities for fashion brands.

'Our technology will permit them to create brand loyalty or ambassador programmes, and gain points or rewards for sharing information through their social networks, emails, and SMS exchanges,' explains Cohen.

The brand protection – and promotion – opportunities presented by smartphone-based authentication are substantial. The ability to combine RFID, with its benefits for retailers, with QR codes to engage consumers, could aid the progress of this trend. It should be noted, though, that consumers' interest in engaging with products through their smartphones has yet to reach a tipping point.

'There are an enormous number of developments aimed at smartphones, so they undoubtedly have a role; but whether that is with the consumer, I'm sceptical. I don't think that consumers are sufficiently motivated yet to whip out their phone to examine goods,' says Lancaster.

'I also think that there are sociological and environmental issues. What does a consumer do if an item is counterfeit? Turn to the owner and say I'm not buying it?'

While the real uses and limits on how consumers engage via their smartphones play themselves out, there are certainly still opportunities in professional use. Professional examiners, company staff, police, customs officers and trading standards officers could all potentially benefit.

Authentication and marketing
In the longer-term, smartphone-based engagement is likely to lean more towards the brand promotion advantages, as data gathering and customer relationship opportunities present themselves.

'With the evolution of smartphones and the various applications, brand owners can create custom-made applications that will serve to verify the authenticity of a product, while creating a more intimate relationship.

Figure 3
NFC-enabled mobile phones open new anti-counterfeit possibilities
Source: UPM RFID

Both RFID and QR codes present brands with opportunities to obtain valuable marketing information about their consumers, as well as enabling authenticity. And ultimately the integration of near-field communication (NFC) will accelerate this trend.

NFC has now gained some traction in the market – although uptake is limited at the moment because the number of NFC-enabled mobile phones is still very limited.

'NFC technology seems to be making headway in the mobile payment application market. This trend may make its way into brand protection; but until NFC is adopted by a majority of the manufacturers, QR codes are the way to go,' concludes Cohen ∎