The Digital Trade and Transportation Network (DTTN) and Radio Frequency Identification (RFID) Tagging and the Implications for Telecoms

19th October 2004,

Bloomberg Auditorium, Cheung Kong Centre, Hong Kong

Executive Summary

1. In his opening remarks **John Ure, director of the Telecommunications Research Project**, explains to the forum that many teleco's were not too interested in RFID which they saw as an IT issue. This silo-effect on thinking was an ongoing weakness of the industry. **John Hammond, of the Hong Kong Logistics Council and chair of the e-Logs Working Group** who chairs the first session points out that RFID will generate more traffic across telecom networks in the years to come than SMS today, and **Peter Stokes, Senior Vice President (DTTN) Tradelink (sponsor of TIF)** reflects on the silo effect when he surveys the 'islands of IT' stretched out across the industry, something the DTTN is designed to help overcome.

2. In chairing the first session **John Hammond** reminds that Tradelink has already started work in good faith ahead of the formal contract being awarded to create the DTTN and to bring together the advisory bodies on the standards side which is 'where the link will come between the DTTN and RFID.' **Peter Stokes, Senior Vice President (DTTN) Tradelink**, begins by raising the main challenge, can Hong Kong compete when there exists 'a $200 differential between shipping a container from Shenzhen as opposed to shipping from Hong Kong. Are we efficient enough?' How can IT help, especially when we find across the many different parts of the logistics sector islands of IT systems using different platforms that can't communicate with each other? That is the role of the DTTN, to provide a 'neutral, open, non-exclusive and transparent' platform. It has been planned to render more efficient 10 major trade and financial processes and over 60 different business documents that are regularly used in trading.

3. The DTTN will be run by a Tradelink subsidiary, **DTTN Ltd**., which is owned 28% by trade associations, 21% by government and 51% by Tradelink, which is also 42% owned by government, so in total government owns 42.42% of DTTN Ltd. [John Hammond adds that to ensure neutrality an 81% majority will be required on key decisions.] Tradelink's own exclusive licence to process electronically government trade documents expired in 2003 and its current non-exclusive licence extends to 2008. Tradelink has 54,000 subscribers and processes 17 million transactions a year, encrypted by Digi-Sign.

4. But how to persuade companies, especially SMEs, to adopt the DTTN procedures? The mission is to make the DTTN compulsive not compulsory, and at the centre of the project lays the issue of commercial 'trust'. Trust the DTTN to complement the existing business processes in use, to be easy to access and to use, to be efficient, cost-saving and secure. The DTTN consists of 3 layers: (i) standards and protocols, which is where RFID comes in; (ii) the core messaging infrastructure and platform that allows documents received on one format to be converted into another for the third party, and (iii) value-added services, such as financial products, multi-modal integration, etc.,

where the DTTN will seek collaboration from other service providers. The priority area for development is Hong Kong-Pearl River trade.

5. Keeping the cost low will be crucial to the successful uptake of the DTTN. Current pricing proposals aim at $2.50 per document delivered and transformed, and initial connectivity, commission and annual fees applied on a cost-recovery basis. During the pilot trial period fees will be waivered. Answering the original question about challenges, the DTTN aims to help sectors of the logistics chain, for example freight forwarders, fend off low-priced competition from, for example, courier companies by increasing their efficiency and adding value to their services. A key part of the latter will be online financial transactions and the involvement of the financial institutions will be critical. The other part of the answer is to build trading partnerships across the region, starting in Mainland China, and especially with value-added service providers in China. RFID is one of the technologies that will play a role in, for example, track and trace across borders. For this reason establishing common standards for RFID is important.

6. From Mainland China, **Edward Zeng, President of the RFID China Forum, founder and CEO of Sparkice (Internet café chain) and international coordinator for China Auto-ID Committee** addresses the issue of standards for RFID. Edward reviews the scale of China's market, especially the cellular wireless market, arguing that China is large enough if it wishes to develop its own RFID standard. In fact on July 26th 2004 China, South Korea and Japan have conducted three-way talks to develop standards and markets, and Edward reminds us that combining China's market with Korea's broadband experience and Japan's chip set expertise offers impressive synergies. During discussion, including information from **Mr Hiroyuki Hishinuma, the Japanese Consul-General in Hong Kong**, it becomes clearer that the voices of China, S. Korea and Japan within the ISO (International Standards Organization of the UN) have not been as strong as their market importance would suggest, and future standards negotiations through the ISO will require a lot of careful navigation. [See discussion for further details.]

7. It is also worth noting that over 50% of China exports are actually from US companies manufacturing in China. Under these circumstances standards for RFID are going to be heavily influenced by the need for global acceptability. Edward advocates the need for 'finding a global interoperable standard' that would work between the standards currently being proposed, the EPC, the UID and the ISO models. Trying to find that interoperability is the aim of the RFID China Forum just founded, which includes representatives from China, Korea, Japan, Germany, the UK, Russia, the USA and Mexico. The RFID China Forum has several working groups covering standards, RFID readers, data content, conformance and implementation and international marketing.

8. **Thomas Schwerk, General Manager IT Asia, Otto International**, provides a first hand account of using a trade network from the world's largest mail order company. Otto International has developed a proprietary XML-based messaging platform for data exchange with its business partners, and with a few large partners has been using a system known as Bolero.net which offers an entire legal infrastructure beneath it. But experience shows how difficult in practice it is to develop a trading platform, with challenges in three areas: technological, procedural and organizational.

9. The technological challenges involve different systems used by customers within and outside the group, and even within the group different warehouses will use different systems. Further 'the IT literacy is fairly low' within the vendor community, and after training people they can leave and go elsewhere. The technology challenge is not too bad in China because the infrastructure is quite good, but not in somewhere like Indonesia, but in areas such as textiles, rather than introduce technology firms often prefer to shift to areas of low labour costs. This in turn generates new procedures and systems have to be redesigned. Different firms will use different product categories, different modes of shipment and different payments modes. Organizationally, the value chain is becoming more difficult as batch production of short runs replaces mass production, so IT adjustment costs are spread over smaller quantities. Allocating IT costs between customers, the buying office and small vendors is difficult, and unless Otto International is buying a large share of a vendor's output there is little leverage over implementing a new IT system. Clearly, the absence of long-run contracts and production lines hinders the development of mutual interest in investing in IT systems, but where IT lowers costs there is a growing recognition of its importance.

10. In discussion **John Hammond** sees this presentation as identifying the challenge of moving the SMEs up the literacy scale. **Peter Stokes** notes that SMEs are familiar with PCs and excel spreadsheets, so 'we need something we can use in a way that we want to use it without having to comply with any particular standard this is going to constrain the way we operate.' **Edward Zeng** suggests the ASP model for SMEs because 'today the average cost for suppliers to become RFID enabled, for Wal-Mart, we are talking about $10 million to $12 million investment. This will not work for Asia at all. Finding a virtual host of solutions and making the ASP models, making all the suppliers share a piece of the cost and pay per use, this is an SME model for RFID.' On a cautiously optimistic note **Thomas Schwerk** thinks the DTTN will succeed if it can achieve critical mass. 'Once it is established in Hong Kong southern China will probably follow fairly quickly unless there is a competing product that will grow at a similar pace.'

11. From the floor **Mr Fan Yu (IBM)** explains the evolutionary phases for RFID that IBM envisages. First, compliance, second advanced applications and services, and third the emergence of a new business model using RFID technology. **Edward Zeng** is of the opinion that Hong Kong must remain open to the possibility of an Asian standard for RFID, but **Anna Lin, HKANA**, strongly disagrees that this is a likely development. **John Hammond** rounds off the discussion by reminding us all that Hong Kong adopts standards rather than pioneers them and the standards that emerge must satisfy all ends of the trading nexus if they are to be useful.

Session Two

12. **Anna Lin, CEO Hong Kong Article Numbering Association (HKANA)** begins session two with an update on the launch of EPC Global in Hong Kong. HKANA was established by the Hong Kong General Chamber of Commerce in 1989 and is a local chapter of EAN International and launched EPC Global in Hong Kong in March 2004. Anna points out that RFID has been around in one form or another since World War 2, and the technology is already widely used in auto toll booths, travel cards like Octopus, in dockyards, etc. Anna points out that China held its second EPC forum in Shanghai in October 2004, attended by 700 delegates [a third is to be held in Zhuhai in March 2005],

that EPC Global is a non-profit organization supported by Auto-Labs (MIT and six major universities around the world, including China and Japan) and that the EPC standard recommendations will go to the ISO for ratification.

13. Issues confronting the spread of RFID include coordination of frequencies across countries, solution enablement, the privacy issue, the cost of tags must come down, and agreements along the supply chain about when and where the RFID tags are to be attached, by whom, etc. EPC Global has committees to study these and other challenges, the Business Steering Committee, the Architectural Review Committee, the Technology Steering Committee, the Auto-ID labs for ongoing research, the Public Policy Steering Committee, each with its own working groups. Private sector companies supporting EPC Global are responsible for around 25% of world trade, and in Hong Kong 20 technology partners.

14. On radio frequencies, EPC Global recommends 860-960MHz, and OFTA is trying to fast track a dual band of 865-868 and the 920 series. Anna refers to the Hong Kong government's decision to set up an R&D lab for RFID technology and to cross-border talks between Hong Kong and Guangdong Province to discuss Generation ll protocol which, once finally agreed, will be put to the ISO as well as to the EPC Global for certification. Anna is convinced that China will support a global standard rather than a regional one and doubts whether there can be a single view between China, Korea and Japan for an Asian standard. She sees RFID development in three stages: (i) a focus on the supply chain, followed in 2-5 years by (ii) innovations [compared IBM's view on applications above], followed in 8-10 years by (iii) tags of 1-5 cents.

15. **Lawrence Cheung, Principal Consultant, Hong Kong Productivity Council**, reviews the use of RFID in Hong Kong and returns to Peter Stokes' question about what Hong Kong can do to remain competitive. Of the costs of goods it seems that 35 to 40 per cent 'comes from logistics and logistics-related services' and this represents perhaps the last of the 'low hanging fruit' for Hong Kong. Lawrence places some emphasis on the cost advantages of error-reduction in the use of RFID over both labour intensive processes and bar coded processes. He also reviews that current state of RFID technology, both active and passive tags.

16. Driving the adoption of RFID are several factors. The cost of tags is falling, data storage technologies are improving, buyers like Wal-Mart are demanding RFID adoption by suppliers, standards are unifying, and RFID technology is improving, such as multiple read RFID that allows readers to record multiple tags at a time, passive tags that can be read from 1-2 metres, and active tags up to 500 metres. But RFID is about back end systems as well as the front end interface, including for example the financial clearance systems that underpin operations like the Octopus card.

17. Lawrence warned caution about adoption. Local manufacturers are generally reticent to commit themselves, and the textiles and apparel trades seem to be the first to adopt. The logistics sector is also more forward, for example the Airport Authority will introduce RFID for passenger baggage, and the MTR is trialing RFID. It is important to persuade companies that for every 50 cents they spend on tags, they save 60 cents, and 'what we want to advocate is that tagging of RFID is done at source because that is where the cost is cheapest but the benefit of it is the maximum.'

18. There are limitations on and barriers to RFID, in particular the great variety of materials goods and packages come in. Fluids, paper and metals may present difficulties to reflect radio signals, rainy weather can attenuate signals, and so forth. The types of issues **Thomas Schwerk** addressed (above), namely technologies, procedures and organization alongside costs, are ever present.

19. **Jonson Yue, Senior Marketing Manager, Hewlett Packard** concluded Session Two with some fascinating case study examples from HP's own research on RFID application. The RFID tag itself is basically ballpoint tip sized, with antenna radiating outwards and a mesh containing the writing or numbering. The readers can be handheld devices or large fixed structures such as Auto tolls. HP has been experimenting for two years at its US plants in Memphis and Chester and in Sao Paolo. The experiments include tags on a pilot group of products, on boxes and a production line, using different materials, different shopfloor locations for the readers, etc. HP has also been testing for Wal-Mart (who has chosen 915 MHz) ahead of its 2005 launch of RFID requirements from its suppliers.

20. Many lessons have been learned by HP, including the importance of synchronizing the introduction of the technology with training people in warehouses on procedures. Jonson summarizes the lessons in terms of **four recommendations**. First, prior to adopting the technology a company needs a detailed analysis of its own production process. Second, RFID generates lots of information, but the key issue is what that information is used for. Third, there is always a degree of error which needs to be managed. Fourth, workforce training is essential.

21. Jonson points are a good guidance to the micro adoption of RFID. **John Ure** closed the TIF by noting on a macro level that a key issue is cost and benefits, and if there is no compensation mechanism to spread the benefits to those who bear the costs, RFID won't happen so fast and the overall efficiencies will be lost. What this TIF clearly demonstrates is that there is a lot of advanced thinking about RFID in Hong Kong, and the DTTN launching in 2005 could be a key catalyst for its adoption.

TELECOMS INFOTECHNOLOGY FORUM

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Proceedings

DR URE: Ladies and gentlemen, welcome to the Telecoms InfoTechnology Forum. There are quite a few registered people to come. We have actually got 110 people registered. People will be drifting in but I want to start reasonably on time. For those who do not know me, my name is John Ure and I am the director of the Telecommunications Research Project which is actually funded through these forums and the sponsors of these forums. In this case, we are very grateful to Tradelink for sponsoring this particular forum. The topic, as you know, is a very hot one. Both the Digital Trade and Transportation Network platform, which Peter will be talking about, and RFID, of which there are many views and they do not always agree with each other. We are going to hear from experts and specialists about those. Just one word before I introduce our chairman for the first session. One of the things we have always tried to do in the Telecoms InfoTechnology Forum is to bring together the telecoms, the IT, the multimedia parts of the industry. We see these as overlapping, both in technical issues and in business issues. I am have been in Hong Kong for a long time and yet I am still amazed that an issue like today is for many in the telecom sector not an issue thought to be very relevant to telco's. I am constantly amazed at the way different sectors of the industry think in silos. And when we do a telecoms seminar, often it is not seen by IT people as relevant to their industry. I am still battling after ten years to try and break through these boundaries but I do not think I have had any more success today than I had ten years ago. But it is an interesting issue and maybe those wider telecoms issues perhaps could be picked up by some of the speakers. The proceedings, which are being taken down will be edited by me and will be sent out to all participants and we normally send it on to the relevant government departments as well.

Our first session will be chaired by John Hammond of the Hong Kong Logistics Council and the e-Logs Working Group. I am going to let John introduce our speakers. Let me say a special word of thanks to Edward Zeng from Sparkice who is with us today. Edward, who will be speaking second, has to leave at 4 o'clock to catch a plane back to Beijing. So anybody who wants to talk to Edward should do it during the coffee break. Besides that I will now leave it to John to introduce everybody. Most of you will know John as one of the leading specialists in RFID and logistics and the whole area. John, without further ado would you like to take the podium.

MR HAMMOND: Thank you. Good afternoon, ladies and gentlemen. I have already switched off my mobile phones, I have one for Hong Kong and one for Singapore. If I could ask you to put yours on silent for a moment. It is a pleasure to be here and to be acting as chairman for this first session. By the way, I could not claim to be a expert in RFID, I am not sure that there are too many experts in that subject around today but I think we have at least got some to address you.

One in particular, Edward has already been mentioned by John, our second speaker who is certainly very well known in this field and is certainly a unique character. If you see his CV you will find that he has moved in extremely high circles. We are very honoured to have him here to speak to us this afternoon. He does have to leave, as John mentioned, so those of you who need to catch up with him in more detail should do so at the coffee break as he will need to leave very soon after that.

The format, three speakers, 20 minutes each roughly, and then we will have a question and answer session. From my own perspective here, the DTTN, my role there

is actually as a shepherd. I know people confuse that with chairman. Shepherd is a slightly different role, a UN expression, I think. In my case, being an Australian, and also carrying a British passport, obviously shepherding is in my blood!

That aside, we do have a team, the Logistics Group, and there are other members of that group here today. I can tell you that we are very pleased and excited that we are getting it to the stage where agreements are in place between Tradelink and government to get the DTTN up and running. The target date, Peter I hope will confirm this later, is October of next year. So it is about 12 months away. I know that Tradelink are acting in good faith now and have started the development work and have started the work of getting the necessary bodies together, the advisory bodies on the standards side. That is really where the link will come between DTTN and RFID.

RFID is the buzz word of the day. You can go to a seminar or forum on RFID in any major city of the world every day of the week at the moment. It is an acronym which in banking terms for the last few years has really meant Really Fast Investment Depletion! But it does mean something else now, there is a lot of development going into it but I think it will have a far better outcome today.

Having said that, our speakers today, are Peter Stokes first, senior vice president of Tradelink. He will be followed by Edward who has been introduced. The third speaker is Dr Thomas Schwerk from Otto, again very much involved in e-commerce and very well known. He has been in Hong Kong, he tells me, for eight years, just about the same length of time as I have been here, and our paths have not actually crossed. It shows that it might be a small world but it is not yet too small.

With that, I will now hand over to the speakers. I am sure you need to hear from them rather than me. Peter, you are first. Thank you very much.

MR STOKES: Thank you, John. And thank you, John, the first of Johns, John Hammond's Australian sheep, and I hope I am being shepherded in the right direction.

Today I would like to give you just a thumbnail sketch of the DTTN and some of the opportunities and challenges it offers us. I will start with some context of the opportunities and challenges for Hong Kong, which I am sure all of you are more familiar with than me, and then the background to actually establishing the DTTN and improving Hong Kong's competitiveness, a brief sketch of Tradelink and I will then cover a bit more detail about the DTTN, what it is, what costs we are thinking about, what the benefits are and, in the context of this forum, what are the critical success factors.

All of these items you are familiar with. First up, of course, is mainland growth, expanding as the "factory of the world". But not only that. As the mainland becomes a significant consumer, and it is not only mainland companies and Hong Kong companies but Korea, Taiwan, Singapore, all of Asia, all of the world is looking to compete for business in the mainland.

A question to ask perhaps is: how can Hong Kong companies capitalise on these opportunities, how can they compete for these opportunities? I think I have a very preliminary list of some of the areas that Hong Kong does well in and some areas where perhaps some improvement would be good. Mainland relationships and expertise -- of course Hong Kong has been in the mainland ever since we first were established. International market and design expertise -- no question about that. Finance of course -- buildings like this and those you can see from this window that are attributed to Hong Kong's financial expertise.

There are logistics of course, which have been the Hong Kong life blood since the very beginning. There are some questions being raised now. Can Hong Kong compete against direct shipments from Shenzen going to the rest of the world? Are we cost effective enough? There is talk of a US$200 differential between shipping a container from Shenzen as opposed to shipping via Hong Kong. Are we efficient enough? Are we adding value to say Hong Kong should be the logistics gateway to China?

Zooming in on e-business in particular, there are several issues and challenges that we have. John mentioned this silo mentality. We see the same thing in IT, islands of automation and lack of a coordinated mutual platform to streamline the total trade chain. So we find some areas of course, Andy from Hactl here is in the centre of a very highly automated air industry. There are other areas which are not nearly as automated.
How do we integrate all these parties together?

Similar to this, technology does not talk. It takes a long time, it costs a lot to integrate companies together.

The SMEs are an important force within the Hong Kong and Pearl River Delta economy. Can they really participate fully in e-business?

And the same, the heavy reliance on paper documents and this is where the banks come in. We have been discussing with the banks about accepting electronic

documents. One of the security requirements for that, how we can settle overseas payments electronically? And then lack of integration with government documents. These are some of the challenges for e-business in Hong Kong. Within that context, the idea of the DTTN was raised to help improve Hong Kong's competitiveness as a logistics hub. John mentioned the Logistics Development Council and being the shepherd of the logistics project group. The public/private sector Logs Council itself came up with this initiative of the DTTN to help Hong Kong improve its competitiveness and importantly, to make Hong Kong the e-logistics hub of choice. To do this, the concept of the DTTN was floated, that it should be a state of the art platform that was neutral, open, non-exclusive and transparent. Through this platform we could facilitate trade, transportation and financial information flow. This would be not only in Hong Kong but the Pearl River Delta and regionally and globally and the way that this would be done would be through the use of commonly adopted interconnections, both communication protocols and document structure standards.

We would look at making the ten major trade, logistics and financial processes more efficient and provide natural support for over 60 business documents that have been identified just to facilitate trade and transportation. Through this infrastructure where it seems to be the opportunity to stimulate innovative, value-added logistics and financial services. RFID and the application of this to provide real-time visibility is one very good example of value-added services. And through all this to help promote SME business adoption. The current status of the DTTN -- in July last year, the Logs Council awarded the development and the operation of the DTTN to Tradelink. I emphasise that the DTTN is non-exclusive. Anyone can set up a DTTN if they so wish.

We are now in the process of concluding the government contracts for the DTTN. The focus of these government contracts of the operating agreement is to assure the neutral and community focus of the DTTN itself so it would be operated with the community interests at heart. Tradelink has now established a subsidiary. It is called Digital Trade and Transportation Network Limited. It will be owned 51 per cent by Tradelink, 21 per cent by government and 28 per cent by industry associations.

We are also in the process of establishing the DTTN Standards Group. We have the first meeting on 4th November. The DTTN Standards Group will be representative of the major trade and transportation in financial communities in Hong Kong and it will be setting, looking at and adopting standards, particularly for document structures and for communicating protocols. We have already started work, as John said, in good faith, prior to the government contract being actually executed. Our target is to start the pilot at the end of October next year. This will entail a 13-month development and testing phase.

Just to give you some background about Tradelink for those of you who are not quite aware. Just a list of Tradelink shareholders, 42 per cent owned by government. The other shareholders are basically representative of trade, transportation and finance in Hong Kong, very similar to the sort of neutrality that was asked of the DTTN itself when the concept was raised. Tradelink originally had a seven-year franchise to process government trade documents electronically. That franchise ended at the end of 2003 and we are now operating under a licence that goes up to 2008. We have over 54,000 subscribers now, processing round about 17 million transactions a year. And

importantly, in terms of the trustworthiness of these sorts of platforms, all the documents are digitally signed and encrypted. We have a subsidiary, Digi-Sign, which is recognised under the Electronic Transactions Ordinance.

Critical to the success of any e-business operation, particularly involving SMEs, is customer hotline and support and training. We have a comprehensive three-tier customer support to help us with that. Tradelink's main focus right from the beginning, although we initially started with government documents, is to play a role in helping the competitiveness of the Hong Kong trading community through e-commerce, both through government documents and commercial documents.

This diagram here depicts Tradelink's role as an e-business magnet in international trade transactions. You will see the entities, the communities with which we are connected and within the box you will see the standard supply chain or international trade transaction steps. Tradelink currently has, to a large extent, commercial trade documents and commercial trade services as well as government services that can support most of what is necessary to execute international trade transactions.

With that brief introduction, I will now go on to explain the DTTN and what it actually is. It is important, to start with any description of the DTTN, to enumerate the guiding principles of the Digital Trade and Transportation Network. The first one is neutrality. That there is no bias shown to any particular party or to any particular community. It is not exclusive and it is not mandatory so anyone can set up a DTTN. No one has to use a DTTN, it is purely by choice. As, let us say, my shepherd has been fond of saying, it should be compulsive, not compulsory.

The third point is that in order to provide the necessary level of trust, the operation should be transparent, accountable and responsible. To use the DTTN of course, and to get the benefits of it, one would expect that there would be opportunities for business process re-engineering. But the way we are setting up the DTTN is that it does not intervene with the participant's business processes nor does it mandate or require changes to the business relationships. Of course, using the DTTN there may be opportunities to do so but that is purely at the participant's choice.

Similar to this, the DTTN should also facilitate and respect market forces. This in particular is relation to value-added service providers, other e-business service providers that the DTTN would like to work hand-in-hand with. And lastly of course, it needs to be easy to access and use.

There is another perspective to the DTTN, which is this three-layer model. The bottom layer is the standards and protocols which I have mentioned as being critical to what the DTTN is trying to achieve. The central layer is the core messaging infrastructure. This is what the DTTN Limited company will be building and we are building now. This is the document exchange platform. On the third layer is the value-added services. This can be financial products, multi-modal integration, distribution, management, visibility, services incorporating RFID. So any value-added services where we can see opportunities for revenue, opportunities to make the processes more efficient. A further perspective of the DTTN is its community role. In the middle we have the DTTN core messaging infrastructure. We will see the different functions,

primarily the communications gateway, the document exchange and transformation functions supported by security services and then general business operations support, et cetera. What is important here is the interconnection of all the parties involved in trade, logistics and finance to do with the trade and transportation processes. We have on the right the banks and financial institutions, on the top the sellers, buyers, freight forwarders and carriers. At the bottom, government, inspection agencies, insurance and terminals. On the left we have value adding service providers and region/global service providers. DTTN is actively looking to work with other service providers to complement their current offerings and to expand the reach beyond Hong Kong and beyond the Pearl River Delta. So that our companies, our customers can execute their international trade transactions electronically through the DTTN network. The core infrastructure of the DTTN is to provide the reliable and secure transformation and then delivery of legally recognised electronic documents. I have listed some of the features there. It also emphasises and will provide community interconnections. So, for example, Tradelink's 53,000 traders and forwarders, maybe over 30 major ocean carriers via INTTRA/GTNEXUS. So through establishing a mass of community interconnections, this will achieve the economies of scale and make it cost effective for companies to join the DTTN network, either directly or through their value-added service providers.

The DTTN will also offer document exchange services for supporting these ten major business processes to do with trade and logistics that I have mentioned. What it will focus on initially is import and export between Hong Kong and the Pearl River Delta and then to the overseas market. This will cover truck, rail and river from Hong Kong and the Pearl River Delta and then export to the overseas market, whether that is going to be Europe, the US, other parts of Asia, and then the reverse process.

To make it a little more specific, in the initial rollout of the DTTN, we will support the purchase processes, processes that will allow the participants to get their products ready for delivery. I have listed the documents that will be covered. We will cover local and overseas transportation. We will include integration with government trade document providers, with the GETS providers for TDEC and TTRS for example. Subject to the bank participation, we will get involved in settlement process with letters of credit, company guarantees and so on. The last point is a service to offer the key document ownership transfer and a print right with local online payments. An example of this would be for a carrier, when they release a seaway bill, they currently require the proof that the goods have been delivered to the terminal by way of an equipment interchange receipt and together with payment of the associated freight charges. We are aiming to make that process online. The front-end interface for the DTTN will be several of these, they are web-based enquiries, Excel spreadsheets. There will be web single sign-on via the DTTN to trade and transportation related services and service providers. Importantly, the focus is to enable the participants to use their current or their new application service provider, their ERP or their freight management software package or whatever software they are currently using. DTTN enable that to interconnect to the DTTN network. We will work actively with ASPs and in-house IT departments et cetera to DTTN enable their offerings.

I would like to give you an example of the interconnection using the DTTN. This is just one example of purchase to delivery. I will not go through this whole process but just highlight a couple of things. You will see on the left, buyer 1, who is sending off a

purchase order in NCX12 format, sends it off to the DTTN and that is going to be sent to a seller and DTTN will transform that into the format accepted by the seller. In this example the seller, being an SME, perhaps only accepts an Excel spreadsheet. So DTTN will transform that into Excel. The seller will make the products and arrange for the physical delivery and will prepare shipping order, commercial invoice, packing lists et cetera and then we will send that off to the forwarder, again using Excel. The forwarder, perhaps a European forwarder, has EDIFACT technology available. The DTTN will then transfer that into EDIFACT. Then the physical delivery takes place. We have also an option here without going through the rest of the flow, which I am sure a lot of you are familiar with, is that once the goods are packed and put into their pallets or containers, we could get to the stage of putting in the RFID and actually providing goods movement tracking and visibility.

You can see at the top left-hand corner the box, "goods tracking locations". This may entail different locations, it could be at the factory, it could be at customs point, it could be at different terminals and as the RFID tagged pallet goes by then the RFID, the goods movement event, can be tracked and could be put through the EPC global infrastructure and made available to DTTN. Then within the DTTN environment, the goods and the shipment status can be consolidated and made available back to the buyer, it could go back to the buyer 2 in the bottom right-hand corner and so on. Just to give you an example, the integration between what RFID and associated visibility can provide, together with the DTTN document exchange features. The last section is on the cost of using the DTTN. The objective from the very beginning is to make the DTTN a low-cost community infrastructure. I have given some indicative charges here on this slide. I would like to emphasise that the final pricing details will be determined by the DTTN Limited board closer to the launch. Bear in mind the board does comprise a number of government members. The nature of the charging that we have been thinking about is a document charge based on each successfully transferred and delivered document. We are looking at an indicative charge of $2.50 per document delivered and transformed. Initial connectivity, annual and customisation fees will apply mostly on a cost recovery basis.

We are looking for pilot users to join us in this project, in the development and the initial launch. We would like to offer them special incentives, all the charges during the pilot will be waived as well as rebates accruing for the production phase. Perhaps importantly, there will be the opportunity to be part of the DTTN marketing programme. Moving from the costs to the benefits. I think you will have seen these sorts of benefits in any presentation or discussion about e-business. I think the DTTN, attracting a critical mass, can really achieve the benefits listed here. Cutting the operation costs, this comes through reduced delays, data inheritance functions, so there is not the entry of one document from one platform to another platform or the entry of the same information in multiple documents. If we have an online settlement process that can save time and costs for document delivery. That would also allow much better financial management, credit, cashflow et cetera. A lot of the technical infrastructure of the DTTN, what we have been building and designing has been focused on making it easy, cheap and fast to interconnect with trading partners. So this can be done, should be able to be done quicker and faster than what is probably available now.

The DTTN, I think we have seen this particularly on the forwarder side, threats from the international couriers. Just as one example, the DTTN may be able to help any organisation retain their existing business against competition, partly through providing more timely, accurate and value-added services. And generally with value-added services which are perhaps not even thought of at the moment but just taking the general supply chain management efficiencies, there will be significant business and efficiency opportunities. Those are the benefits and our challenges, how we can turn this into reality. I think in John Ure's briefing paper he mentioned some of these challenges. The first one I think is, so that we can show there will be demonstrable cost efficiencies and opportunities to the initial players so that this will help attract a critical mass of Hong Kong and Pearl River Delta users and notably this would be to the forwarder community.

It will be critical that we can establish partnerships, focusing on the mainland, then regional partnerships and global service providers so that the DTTN can provide the international focus that we are trying to achieve. It is also absolutely fundamental that the financial institutions embrace the DTTN so that we can have online payments so that there is not this comment that we often hear, "What is the point of putting all this electronically, if I still have to print the documents out and send them to the bank on paper?" So it is absolutely critical that this process can be done online.

Lastly is establishing partnerships with value-added service providers so that together we can provide the sort of value and the efficiency that the DTTN is trying to achieve. The example given here is the subject of today's forum, providing comprehensive visibility and tracking of goods, documents and finance, incorporating all the features that I have mentioned on the DTTN but also RFID, EPC Global, as well as financial services. Thank you very much.

The Powerpoint file for this presentation is too large to post on this website. Please contact Dr Jenny Wan at TIF, 2859 1919 or Tradelink if you wish to obtain a copy on CD-ROM.

MR HAMMOND: Thank you very much, Peter. Just to make one point to supplement what Peter has had to say about my role as shepherd. I must say that shepherding the e-Logistics group has not always been easy. Sheep are very difficult to drive and they do not actually follow you when you ask them to. So there has been some lively debates and one of those debates has been around that issue of neutrality. I am sure some of you, when looking at Peter's presentation and seeing 51 per cent Tradelink, 21 per cent government and 28 per cent to industry, are wondering how that represents neutrality. The piece that is missing is the hard-fought agreement that there is a series of decisions involved which will require an 81 per cent majority. You can work that out for yourselves, how that achieves neutrality. We are running a little bit over time. The next speaker is a guest from the mainland, Mr Edward Zeng. He is the founder and CEO of Sparkice, a very well-known e-commerce organisation in China. More recently, he has been appointed as the international coordinator of China Auto-ID Committee and is president of RFID China Forum, who have had their first session this month. He has many other claims to fame, but I think you will find in your handout the circles he has moved in and the honours that he has received from the Chinese government. Without further ado, Mr Edward Zeng.

MR ZENG: Good afternoon, ladies and gentlemen. I think Hong Kong in the past had been positioning itself as a trade gateway for global trade with mainland China and became a financial gateway for a global market with China and a labour gateway for a global market with Asia. I think from Peter's presentation it is clear that Hong Kong is now facing a very dramatic historic choice. The direction is pretty clear. Become the digital gateway for global high tech with the Asia market and become a visible gateway, through RFID technology, to making all the trading, finance and labour become visible and also becoming an intelligent gateway to making intellectual property a standard issue. One week ago in Beijing, we had a very successful RFID forum in China. IBM is our leading sponsor. Before we even formed this event, even two days ago, I was not sure how many people could come. The result was very impressive. We got about 500 people from about 20 global countries. From the government side we had 5 minister levels, including the present office in charge of the policy advising, the China planning commission and the reform and the development commission in charge of the high tech Standard, including the MII and Ministry of Information Industry for the radio frequency and all the ministers who support it. And also the deputy chairman of the China Chamber of Commerce, China Logistics and Procurement Association were all present. Also surprisingly we got about 400 people who paid money to come. The total cost for all the delegations worldwide was more than $1.2 million. This has become a very strong commitment for the global RFID players with the China market.

Of the global RFID players, for example IBM, Intermac, Matrix, you name it, all the major leading players, they come here to present their technologies. We have about 300 people on the CEO and CTO level who spent two days and every day ten hours without people leaving. So the demand for RFID is surprisingly higher than what I thought. Today, no matter whether Hong Kong, China or worldwide, the big problem is not a technology issue. Right now the big problem is the intellectual profit, who shares what and who will get benefit because of the standard issues. I think today's RFID is like this chart shows, one horse has four directions. EPC is saying, "You should go this way", ISO is saying, "There is the old tradition way, why not go follow the old way?" Japan is saying, "Hey, I have UID as a standard". And China has tried to initiate the NPC standard. So multiple global standards, different regional alliances and independent national initiatives, making the work become more complicated with more and more delay. I had a chat with Anna Lin a month ago and she wanted to make Asia become one standard, following the EPC Global but unfortunately I think Japan, they already have their own standard they do not want to give up. Also in August, the Chinese government had an internal document saying that in order to protect the national interest and in order to define their own products made in China. China may not 100 per cent follow the EPC standard.

As a gateway, in Hong Kong how do we do that? And what role will China play? To answer the questions we need to know what is the power for China to play? And what are alternatives to the standard? Let us talk about RFID. RFID means radio frequency and product identification. Today, what are the largest radio frequency terminals in the world today? In China mobile telephones are one of the terminals that are used as a radio frequency. I think China today has become the world's largest market. Also, as in Peter's presentation, in the past China has become emerging as the world factory. So Asia has become one of the largest product manufacturer in the

world. If every code for every product in this region had their own standard what would that mean?

Let us talk about the numbers and maybe we can learn some lessons from the mobile industry. In 1998, China mobile had only 8 per cent, which is 23.9 million, compared with 30 per cent in Japan and Korea and 37 per cent in Europe. China had a very small market share. At that time only a few companies were thinking about China as a very strategic importer. I had a chat with a former chairman of FCC in the US. He said one of his biggest mistakes is that he did not open his CDMA standard to China as early as possible. The same mistake, I had a chat with NTT Do Co Mo, he said one of the biggest mistakes for Japanese technology is the wireless is not using China as a market, they are using their technology. Differently, the European based Nokia and Ericsson to open their standard, GSM, they opened their market.

Today if you look at 2003, for every four people worldwide using a mobile phone, one comes from mainland China. China has already surpassed the US to become global largest mobile phone market. If you look at the numbers, 269 million mobile subscribers, it is probably bigger than the US population in total. This year it is going to reach 310 million.

This is a very important lesson that we learn from the wireless mobile phone industry. Even at that time Qualcomm Motorola became the CDMA manufacturing standard. At that time China was very small, like today's RFID, but eventually if China wanted to do something I think the market share would define the standard. If you look at a comparison between the mobile users in China and the US since the year 2000, China has already become the global largest wireless market. This year it is over 310 million which is more than double the US. Not only the wireless, look at the Internet. in the year 2005 most likely, China will surpass the US to become the largest global Internet users.

From 1997, when I first started my business in China in 1996, I opened my first Internet cafe. Why did I do that? Because at that time no one could search on the Internet, you had to create one. At that time there were only 100,000 Internet users in 1996. If you look at today I think this year China already has over 120 million Internet users and the same thing for fixed line. In 1999, China already had over 100 million fixed line subscribers and it has already become the global largest fixed line user in the world. If you look at all the three industries, China created four global largest telecoms. Yesterday I had a chat with the CEO of China Telecom, Edward Tian. If you look at the CNC model, last year they bought the Global Crossing to become the largest Asian broadband providers. After IPO I think they will become the global largest broadband carrier. If you look at China Telecom, Their earning in total is bigger than Microsoft. If you look at China Unicom, they have only a five-year history to get their full license but now, without Unicom, I should say the CDMA will become a regional standard in the US, not a global standard because of the US-China trade as a political bargaining point between Bill Clinton and the Chinese government. So they got a deal, they got a licence from Unicom because I was involved in that deal as well. If you look at the total market shares, the total China Telecom have clearly become the global largest but unfortunately at that time China did not define their own standards. The GSM defined by the Europeans and CDMA defined by the US. Looking at the manufacturing side, last

year China's import/export was over $830 billion and this year will surpass US$1 trillion. 36 per cent of TV output is made in China. 51 per cent of air-conditioning is made in China. More than 50 per cent of textiles is made in Asia. All those numbers, we can see China is becoming the manufacturing centre for the global outsourcing market. The lessons that we learned from wireless telecoms is that if we look at this fact, today 94 per cent of the China market has come from the European GSM standard and 5.4 per cent China of subscribers use CDMA and 0 per cent using the PDC Japan standard.

The lessons that we learned is that the global standard has to be considered on its merits with the global largest market and combined together can redefine who have the really global standard.

My conclusion for the first part is, and also the advice for the EPC and new ideas, I think it is too early to say who are the de facto standards if not considered by China. The most interesting thing for this event in Beijing is that China, Japan and Korea, plus ISO, were talking about some very interesting concept. China plus Japan, plus Korea means they have the best technologies. You can see from the new chip, from Hitachi, it is the smallest and cheapest chip today. If you look at the UID reader you can have a triband, multiple language reader. If you look at Korea's broadband. Combine the three countries, what would that mean? On July 26th, China, Japan and Korea already signed the three-country standard alliance, including not only 3G but also RFID. Last week they had a round of several internal informal meetings. ISO is another organisation. They have a lot of ISO standards. They are also interesting to talk. And also I know that the minister of the UK information industry is also talking with the minister of China and also Russia. So what happens if China, Japan, Korea, plus ISO, plus UK, plus Russia find some new things? I think this world will become very crazy. The solution is very simple. I think a lot of media have misled my presentation in the past, including my speech in Chicago, thinking about China trying to set up their own centre. My personal advice is that we should consider finding a global interoperable standard. So the vision I am proposing is this, the R1, which is an intersection between the EPC, UID and ISO, and finding and defining the interoperable global standard and driving the standard to become original in the global market and to find applications.

For that purpose, one week ago we formed RFID China Standard Forum. The vision is try to become an interoperable standard, to make all kinds of standards work together and make the thing happen. Otherwise when we talk about the Tradelink or DTTN in Hong Kong, without China clearly setting up a standard, all the shipping goods will have two tags or three tags. And who does the data synchronising if there are different standards? What kind of reader do we want to use? Without clearly understanding the interoperable standard and all the RFID, international trade with Asia will be temporarily stopped. For that purpose we formed the China RFID Forum. Under the forum we have a standards committee, we have an international sales committee, we have a Japan representative, we have a Korea RFID president as a representative, and Russia, UK, Germany, US and Mexico. Under the country representative we also have five working groups. One is called Reader Group, one is Radio Frequency Tag Working Group, another is Data Content Working Group and Conformance and Implementation. So five working groups trying to work together to find a solution. Only talk does not work. It is very important to have physical, workable

solutions. For that purpose we also fund the first RFID enabled Future Club. I think IBM, Intermac, Matrix, BA, Cyberspace, all the big players already committed money and equipment to try to make the first RFID future club work. We also tried to get a licence from the government to make the future RFID solution in China has to be certified through this national lab. I hope today we got Intel and HP to join us in the future, otherwise you have probably got a six-month information delay and also probably missing a lot of sales opportunities. For the opening day we invite 50 CEOs from all industries in China, they are all very interested. I think this future club has become clearly a very unique environment for RFID application and the steering committee.

In conclusion, I think many years ago, IBM became a mainframe machine-to-machine standard leader. Later on Microsoft and Intel became man-to-machine PC platform standard leader. Recently Nokia, Ericsson, Qualcomm, Motorola have become person-to-person mobile terminal standard leader. But RFID is talking about people with things and things with things. We are talking about not last mile, not first mile, we are talking about last inches. This standard is not established yet. So, together let us make the global become an interoperable, make the solution become a touchable, let us make every business move and I hope my presentation can give you some idea.

West Meets East: SEEKING THE GLOBAL INTEROPERABLE STANDARD

ISO

R1

EPC UID

by Edward Zeng

Prepared for: October 19th 2004

Exciting Time for the RFID Industry

But, Where to Go?

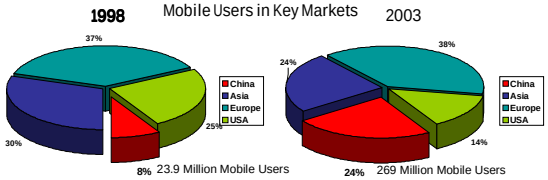
- Multiple Global Standards
- Different Regional Alliances
- Independent National Initiatives

Part A: RFID in China

- RF = radio frequency → The mobile phone is the world's most widely used wireless device
- ID = product identification → The largest single manufacturer of goods is China

Who Shares the RF/Wireless Market?

Mobile Users in Key Markets

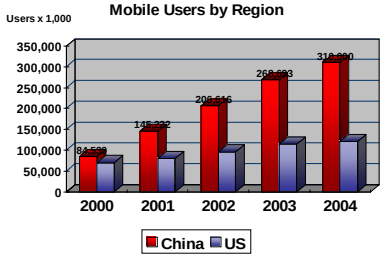


China's mobile phone market has increased ten-fold to become the world's largest mobile market

Source: International Telecommunications Union

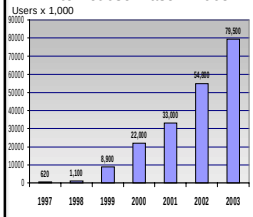
RF in China

China & the US: Comparison of Mobile Markets

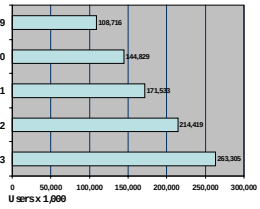


China's Emerging Global Role

China - The World's Largest Internet User Base in 2005



Growth of Fixed Telephone Lines in China



China's number mobile users is at the same level as the *entire* US population – fixed lines in China are also approaching the same milestone.

A Broad Look at China's Telecoms

- China Mobile (CMCC) was spun off from China Telecom in 2000
- Wireless services on GSM & GPRS
- 2002 subscriber base of 140 Million
- China Mobile employs 114,000

- China Unicom was formed in 1994 to break the China Telecom monopoly
- Services include wireless, VOIP, toll, internet
- 2002 Subscriber base of 63.2 million (11M CDMA)

- China Telecom formed in 2002 after split of the former China Telecom (South Region)
- 2002 Subscriber base of 130M fixed line
- 24M internet users
- CTC operates in 21 provinces

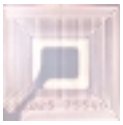
- China Netcom formed in 2002 after spilt of former China Telecom (North Region)
- 2002 Subscriber base of 78M fixed line
- CNC operates in 10 provinces

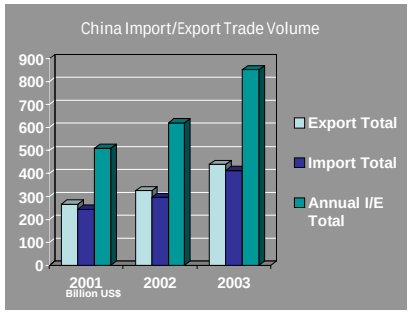
Full mobile licensees | PHS networks in Urban areas

China Telco Carriers	CMCC	Unicom	CTC	CNC
2003 Revenue/ USD B	20.6	8.9	13.8	
2003 Subscribers/ Million	180.0	90.0	118.0	
2003 Market Cap/USD B	66.2	13.9	32.0	
Main Type of Services	GSM & GPRS	GSM, CDMA, VOIP, Internet	Fixed Line, Internet, PHS	Fixed Line, Internet, PHS

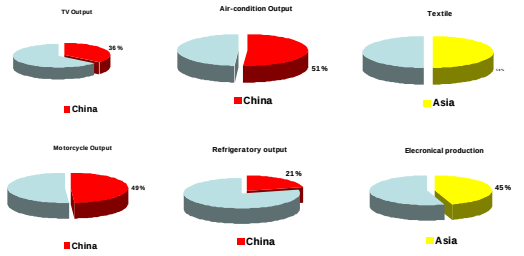
Source: Research from Sun Microsystems

China, The World's Manufacturer





China's Output – Present & Future



Asia has taken the largest share in the worlds production. As tagging at the product level becomes prevalent, the amount of data transferred (ONS queries) will far exceed present internet usage.

Source: Sparkice Research Center

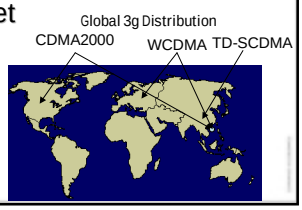
Lessons Learned

	2G Standard	Market Strategy	Marketshare	Number of Users*
Europe	GSM	Early & Aggressive	94.6%	192M
US	CDMA	Late-comer	5.4%	11M
Japan	PDC	Refused to open standard	0%	None

*data from 2002

The World's Largest Market

- China allowed to influence Standards
- Open global standards prevail



Advice for EPC and UID

Summary

GSM + China = The majority of the global market share

The proponents of GSM:

- **Visionary** – Opened their standard to China, instead of the inflexibility of Japan's standard
- **Fast Movers** – The first to market
- **Flexible** in implementation with local partners

These qualities are essential in introducing a global standard into China's markets

Part B: R1

For the Global Interoperable Standard

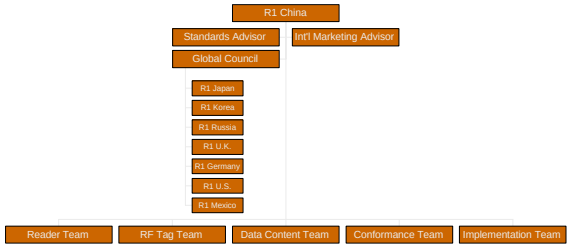
- MISSION:
- Develop an interoperable global standard
- Drive this standard in regional and global markets
- Protect the interests of China and the Asian community
- Ally with leading global
  - Vendors
  - Regional Partners
  - Regulatory bodies
  - Entrepreneurs

China RFID Standards Update

RFID CHINA FORUM

- SparkiceLab has organized forum to continually direct RFID standards & represent Industry
- The vision of the forum is:
- Openly showcase RFID products and solutions to Chinese officials and business leaders in the "Future Club" venue.
- Lobby the Chinese Government on behalf of its members for standards and infrastructure applications.
- Educate China's public and private sectors in RFID technology and applications.
- Facilitate interoperability between products from participating vendors in the China Forum's lab environment.
- Initiate collaborative pilot projects to demonstrate solutions to China's industry and government decision makers.
- Membership is open to
  - leading players in the RFID industry
  - Chinese government official bodies
  - Manufacturers & Retailers

The R1 Team Structure



Application in Action

- Future Club
  - Application/Demo/Training Lab for Interoperability

China's 'Future Club' is an excellent opportunity for RFID vendors and solutions providers to:

- Showcase their products & solutions in a real world environment
- Educate manufacturers & government officials about the capabilities of RFID

Conclusion

Road Map for Global ITC Revolution

Mainframe	PC	Mobile	RFID
Machine to Machine	Man → Machine	Person → Person	Person → Objects
IBM	IBM, intel	ERICSSON, NOKIA Connecting People	?
First Mile	Last Mile	Last Meter	Last Inch

Conclusion

Road Map for Global ITC Revolution

Mainframe	PC	Mobile	RFID
Machine to Machine	Man → Machine	Person → Person	Person → Objects
IBM	IBM, intel	ERICSSON, NOKIA Connecting People	?
First Mile	Last Mile	Last Meter	Last Inch

Conclusion

Together, Let's Make R1 Work!

THANK YOU

MR HAMMOND: Thank you, Edward, there are some interesting insights there. I know there is a number of Hong Kong companies who will wish to stick very close to Edward and future developments there. I noticed for instance, the prediction that RFID tagging would generate more traffic than the existing Internet. That is a mind-boggling prospect, I must say. Perhaps we will have some questions later.

The next speaker from Otto International is Dr Thomas Schwerk. I think Otto is well known to many people here and are best known as their claim to fame as the biggest direct mail operator.

MR SCHWERK: Thank you very much. I would like to talk about the DTTN and how it pertains to someone who might be a potential user of it. I will give you a quick outline of what the Otto group is, what it has done and what Otto International Asia, OIA's role is within the Otto group. Then give you a brief overview of our current document transition strategy and give you an idea of the challenges we have been facing and where we are looking to go in the future. As John mentioned, the Otto group is the world's largest group of mail order companies. It is privately owned German company with headquarters in Hamburg, with a global turnover of 15 billion Euro and 55,000 employees worldwide. The main sales markets are Europe, North America and Asia. The primary sourcing markets of course are Asia and particularly, growing China. We have heard that China is the world's factory. That is interesting for us because that is where we are procure most of our merchandise.

OIA, Otto International Asia, is the Asian buying organisation for the Otto group. With a turnover of about 900 million Euro a year, 850 employees and it provides product sourcing, quality assurance and quality control as well as information for our group companies and third party companies on where and what to source in which particular markets. An interesting point to note is that we do about 94 per cent of our turnover with textiles products. Though we do have teams that dedicate themselves to hard lines, furniture, anything else that you find in a normal mail order or any sort of other retail outlet.

The current document transmission can be basically broken down into two individual parts. On the one hand we have realised the need to exchange data with a number of our business partners and have started working on proprietary XML-based solutions. We upload style and order information from some of our customers. We download to our customers production and shipping status information and we have established some projects with forwarders to get shipping instructions in order to save the data entry work on that front. Needless to say that is the area where we expect to have the biggest productivity gains in the future and that is where we are very interested in the DTTN and hope that it can help us in that respect. We have, however, worked with Bolero.net which has some of the same focuses of document transmission with an entire legal infrastructure underneath it. We are currently using Bolero for two of our customers, particularly our head office Otto in Hamburg and Otto UK which is the UK subsidiary.

I would like to give you an idea of the current challenges that we are facing. Please bear in mind, I am focusing on the negative parts of course, because that is what we are working on. By and large I would say the systems that we have at Otto international are rather at the top end of what our competitors have. We had a thing that we did PSA Curzon and Associates about three years ago where we compared our IT infrastructure with similar companies and we found we are in the top quartile. Where, by and large our systems are good, we still face a number of challenges. Each of these three areas: technological, procedural and organisational things, I would like to preface with a quote that I am taking shamelessly out of context. But it summarises the ideas of what we have and presents them in a somewhat humorous way. For example, of technology challenges I have heard in the past, "So, Tom, what exactly is the difference between ISDN and the Internet?" Of course that brings me to a point where I have to go, "Well, where do I start?" On a more serious level, the difficulties that we face is that we have

different specifications for different customers within the Otto group and outside the Otto group. Even within a customer different warehouses use different systems, which again require different interfaces. Among our customers and our forwarders as well as our vendors we have varying levels of automation. We have some business partners that we work with that are highly automated. We have some that we saw from Peter's presentation, the ERP system is Excel based. So we have to cover the whole variety of automation spectrum. Generally within our vendor community it should be noted however that the IT literacy is fairly low. We find of course with the textile industry in particular, as soon as the IT literacy becomes too high, the production costs become too high and people move to cheaper areas. As people have moved from Hong Kong to southern China, they now move to northern China, Shandong province and even Mongolia. Of course, every time we have somebody trained up, they move somewhere and we start afresh. As a result of that the IT infrastructure is not what we are used to here in Hong Kong. China by and large is not so bad but we also do work in areas where IT infrastructure is a challenge. I am thinking particularly of places like Indonesia where I think we probably spend a disproportionate amount of time trying to fix things that are basically IT infrastructure related.

Moving onto the procedural issues. We heard about standards and the problems. I hear frequently, "I have no problems with standards ... as long as I have my own." That makes it a challenge as well. The procedural challenges that we face in particular is that the procedures are changing rapidly. One the one hand that is a good thing because it shows that many of the business partners that we deal with are looking to optimise and are finding that optimisation is required. We are finding that many of our customers have different procedures either by product category or by mode of shipment or payment modes. And talk about my own procedures, every buyer that comes to you will tell you, "Yes, but shoes are different." We are grappling with that and finding the right balance between standardised procedures and giving people the flexibility to actually optimise their internal systems actually is a challenge. I mentioned just now, people keep moving to different geographies. As the production costs become higher we move to a different area. That brings with it procedural challenges. We are currently, within the Otto group, finding that it is cheaper to do business and many of the tasks in Asia than in Europe, lo and behold. So we are, within the Otto group, shifting procedural and process responsibilities from a number of our customers to Asia and that results in procedural changes that we need to address as well. Additionally, with the retail climate becoming very challenging nowadays, we are finding that the order quantities are becoming less and less and the number of styles that are purchased are becoming larger and larger. So for the same turnover or even a drop in turnover, we are actually doing more work. Which is a thing that we need to address.

In terms of organisational challenges that we deal with, again I am taking it shamelessly out of context here, "I like your project, you have my complete support, but please do not come to me for cost savings." These kinds of things do show that each of our companies are under extreme cost pressure. Open the Financial Times and you will see the latest horror stories of retailers in the west that are having difficulties.

As a part of that there is a difficulty in allocating costs between our customers, us the buying office and our vendors. Each of us, of course, is trying to push things in the other direction. Additionally, many of our vendors are small. They may be small in absolute size and we may have a very small share of their total business. Both of those

things give us, as the buying organisation or the Otto group, less leverage to implement new procedures or to ask them to adopt new technologies. On top of that, since we are looking to find the best possible prices at any one point in time, our vendor base changes. With changing vendor base it is difficult to implement procedures. By the time we have them implemented either they move up north or we drop them completely.

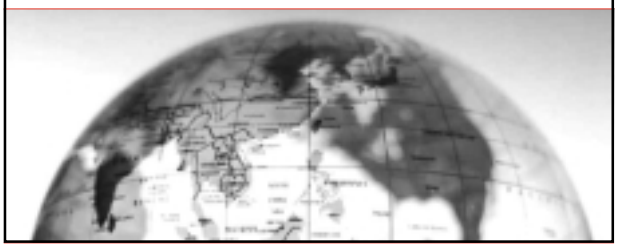
Within the IT department, between the Otto group and Otto International Asia, again there is a changing and shifting of responsibilities so we are trying to find the happy medium. There is a different focus of course, that our customers have in terms of systems, in terms of how to organise the process than there is within the buying organisation here in Asia.

In summary, I know we are under time pressure -- basically the textile and retail industry is under severe pressure, we are responding quickly to the changes that are coming our way. Changes in the process make it difficult to establish IT systems and the IT literacy that we are trying to build up constantly gets undermined by new business partners or moving of the existing business partners. Long-term investments in relationships is not the forte of what we do. On the positive side, as a group and as an industry I think people are recognising that there is need to invest into processes because only that way we can ultimately gain long-term profitability. So there are two conflicting currents that are currently coming our way. Thank you very much.

Electronic Document Transmission at OIA

Presented by Dr. Thomas Schwerk

October 19, 2004



Outline

- The ***otto group*** and ***OIA***
- Current Document Transmission Strategy
- Current Challenges

The ***otto group*** and ***OIA***

- The ***otto group*** is the worlds' largest group of mail order companies with
  - 15 billion Euro turnover
  - 55,000 employees
  - Main markets are Europe, North America and Asia
- ***OIA*** is the Asian buying organization of the ***otto group***
  - 900 million Euro turnover
  - 850 employees
  - Provides product sourcing, quality assurance and control
  - 94% textile products

Current Document Transmission Strategy

- Proprietary XML based
  - style and order uploads from some customers to ***OIA*** systems
  - production and shipment status download to some customer systems
  - shipping instruction from one forwarder
- Trade document transmission via Bolero.net from vendors to ***OIA*** and customer systems

Current Challenges

- Technological
- Procedural
- Organizational

Technology Challenges

"So, Tom, what exactly is the difference between ISDN and Internet?"

Technology Challenges

- Different interface specifications by customer and warehouse
- Varying degrees of automation among customers and forwarders
- Generally low IT literacy within our vendor community
- Unreliable IT infrastructure in some production areas
- Diverse production locations with varying IT sophistication

Procedural Challenges

"I have no problem to with standard procedures …
as long as I can have my own!"

Procedural Challenges

- Rapid changes in procedures
- Different procedures by customer, product category, mode of shipment and payment terms
- Continuous change in production geography
- Responsibilities are shifting from the customer to the buying organization
- Many orders and small quantities

Organizational Challenges

"You have my complete support for this project…
but I don't see how it will save costs in my department."

Organizational Challenges

- Extreme cost pressure
- Cost distribution between customer, buying office and vendor
- Many small vendors
- Changing vendor base
- Dynamic ***otto group*** IT strategy
- Different focus between customer and buying organization

Summary

The textile production and retail industry is under severe cost pressure and "responsive to climate changes".

As a result

- IT literacy and infrastructure is not a priority
- Long-Term investments and relationships are not the norm

But

- The value of optimized processes is increasingly recognized

MR HAMMOND: Thank you very much, Thomas. Just again, from my perspective, what we have just heard is a validation of many of the concepts that have gone into the DTTN. So I think what Thomas is talking about are the difficulties in moving the SME up the IT literacy scale. That is what the DTTN proposes to do.

I will also add that it is interesting to see a presentation from a user, if you like, customer, practitioner, that did not mention EDI. Three years ago, five years ago, it would have been "EDI, EDI, EDI". "EDI or die" was the expression. You do not see it today because really the technologies have moved on so far that there are better ways of doing that job. That again is a bit of a challenge, in that those technologies are still developing and still emerging. I suppose the next one is RFID and how we integrate that with the still evolving Internet-based technologies for e-commerce. So very interesting, thank you very much indeed. That is the three presentations. We have some time for question and answer. If I can ask our speakers to sit in these chairs, we can then invite questions. We have about 15 minutes.

DR URE: I remember when I first came to Hong Kong about 15 years ago. Indeed EDI was just coming, as you just mentioned. I was being assured by people at the Productivity Council and other bodies that this would be spread by large buying organisations which required their suppliers to conform and that way it would spread through the SME community. Here we are fifteen years later. That does not really seem to have happened a great deal. I would like to get a comment from each of the three speakers. What is going to be the dynamic that really sucks in the SMEs to this process?

Tom mentioned the fact that there is no long-term investments and relationships are not the norm. If that is the case then an SME, is it going to be wise if it invests in some technology into a relationship that might not exist next year? This is a real problem. I know there is no solution but do any of the speakers have a vision about that? The $64,000 question.

MR HAMMOND: I suggest we pose it to Peter Stokes first.

MR STOKES: John poses all these problems and looks to someone else for the solutions. It is a problem. I think Edward's idea is probably quite useful. By drawing a parallel to the takeup of mobile phones and what has prompted that, everyone is using mobile telephones these days, all SMEs have fax machines. In my experience most of the SMEs that we are dealing with have a PC with Microsoft Office of something like that on it, tending to use an Excel spreadsheet for a lot of the work that they are doing.

Drawing some conclusions from that it may be saying that -- it applies to SMEs but to individuals as well -- we need something that we can use in the way that we want to use it without having to comply with any particular standard that are going to constrain the way that we operate. What we are trying to do with the DTTN, and unfortunately there is no guarantee with this, we are going to put something in place that allows the SMEs to use what they are currently using but submit it in a way that is acceptable by the DTTN and then we can put it into whatever format is required by their partners. That may be another Excel spreadsheet or it may be something that Hactl, a big forwarder needs for their ERP or their FMS systems to process. Unfortunately we are not 100 per cent sure of that. I would be interested to hear any other suggestions or solutions to that.

MR ZENG: I think SME versus the super large company, if you look at the many industries you get the same conclusion. A super large company always becomes the first mover for adopting the new technology or inventing new technology. Eventually, whoever gets SMEs to use it, they become the de facto standard. So if you look at the PC market, starting 50 years ago was IBM's big machine but SMEs could not afford it. Later on, Apple and IBM and other companies invented the PC, personal computer. Microsoft and Intel control the Wintel platform, becoming the leading standard.

So the DoD today, as before, they always have big purchase orders to support technology innovation in the US. In the past they have become the big IBM main machine buyer and create new technology for the US. Now DoD also are using RFID in the Iraq war and using it to do their control. Wal-mart also. I think all the big buyers, the big guys become the new technology inventor. But eventually, RFID, who will become global leader, has to be thinking about using the SME as the major base to setting up his own standard, to create a low-cost, under $100,000 maintenance cost for suppliers to using RFID. Because today the average cost for suppliers to become RFID enabled, for Wal-mart, we are talking about $10 million to $12 million investment. This will not work for Asia at all. Finding a virtual host of solutions and making the ASP models, making all the suppliers share a piece of the cost and pay per use, this is an SME model for RFID.

MR SCHWERK: I think in a certain sense time is working in our favour because if any of you have kids who are ten years old they are probably better on the computer than we are. As the younger generation starts to use computers more naturally than we do the general IT literacy goes up and that will be across the board. Eventually this is going to come our way anyway. It is a question of: can we find a single standard? We had an extensive presentation on that so that from a user perspective, buyer organisation or a customer perspective can we ensure that there is a standardisation and can we, through an initiative like the DTTN, accelerate that to the point where it becomes self-reinforcing.

The initiative that we had with Bolero assumed that once there is a certain threshold that you reach, then it will be is snowball. With Bolero that has been a challenge, we have not reached that threshold. If the DTTN can include enough members that anyone not joining the DTTN will basically lose out on business then from there on out it will be very simple. Once it is established in Hong Kong southern China will probably follow fairly quickly unless there is a competing product that will grow at a similar pace.

MR HAMMOND: Just to make the link between the past and future, I think what John was referring to in the larger manufacturers or the larger players driving standards in the early days of EDI, the best example I had was ICI who virtually said, "Well, if you do not use my form of shipping instructions and if you are not able to receive it electronically I will not ship with you." A pretty powerful message. That was in the days of value-added networks, store and forward, of complex EDI systems, of every enterprise having to have its own EDI translator.

Today we have moved on. We have Internet, we have IP, we have a global standard, we have XML, which will hopefully be a global standard and we have point to

point transmission. So we have a better opportunity to level the playing field and make it an easy EDI offer to the SME which will help them move up that IT literacy scale. Any other questions? That was a very good question, thank you, John.

DR URE: A point on Edward's contribution. Edward, you were raising this whole issue of China developing, maybe, its own standards. On the one hand you think, "Oh no, yet another standard to enter the field." You mentioned mobiles, we went from two standards to three standards, now we are moving to four standards. It seems to be going in the wrong direction. The answer seems to be interoperability. Where you get that, as long as these standards can interoperate, perhaps it does not matter too much. Is that the way forward? How do you see co-operation between Hong Kong and mainland China on this issue?

MR ZENG: As I said in my presentation at the very beginning, I think if Hong Kong wants to shift from the tradition trade gateway, traditional financial gateway, traditional labour gateway, into the digital gateway, intellectual gateway and visible gateway, I think the key issue will be understanding both sides. I can see the big buyers between the west and mainland China because as a history, Hong Kong is from the system that they built from the UK standard. Even driving a car, using the right-hand side. Be careful if you want to drive a car in Beijing, you have to stop, you get a ticket. I think that you cannot find a car with seating in the middle. My suggestion is if you sit too much on the western side you may live for this game if Japan and Korea join. And Hong Kong's role is in an increasingly decreased position.

If six months from now still have a chance to come up with a solution, one year later, once China, Japan, Korea plus ISO, R1 committee, has become action and if the Chinese government becomes endorsed, if the 500 top companies become application clients then the largest de facto standard in the world is already established. Look at my example for mobile telephones -- if China become today the single largest market and China plus Japan plus Korea altogether become 51 per cent global wireless market, become the global largest broadband Internet, what does that mean? It means the same thing, China will become a new standard leader instead of, like today, CDMA. My suggestion for Hong Kong is: I know you are familiar with driving a car on the right-hand side but you need to learn to drive on the left.

MR HAMMOND: We have another question.

MR HIROYUKI HISHINUMA: Can I add one comment. I am from the Consulate General of Japan and from the Ministry of Telecommunications from Japan. I would like to explain the background of the corporation between the mainland, Korea and Japan. More than ten years Japan directors made an effort alone but just recently realised it will be much more important to co-operate within the Asia area, especially with China, with the global factory and with Korea. From one or two years ago, same at a conference between the ministers of information and industry between China and Korea and Japan. Recently, on July 26th, at the conference in Hokkaido, just proposed the standardisation of RFID technology. Maybe that is not only what the directors say is intra-government with the co-operation of industries and trying to make an establishment of the new age of standardisation. Previously the standardisation is only

occupied by either the US or Europe. The future we can establish a new way to make standardisation globally.

MR HAMMOND: That is an excellent comment. It does illustrate the change that is happening in the power shift. It used to be, as you say, it was US with NCX12 or Europe and globally, supposedly with UNN EDIFACT, which was a global standard with little Asian input to either of those, so imposed standards. With RFID I think we have to be careful to insure it is global because it is one thing to say we are going to apply standards in Asia but what we are talking about is serving customers in the OECD and Europe and the US who are the biggest buyer influence. We will have to satisfy both ends of the equation. That is not going to be easy but with greater strength here we are looking for more say in those standards issues in Asia than we have had before. More questions all of a sudden.

MR FAN YU: This is not a question but a comment too. I am Yu Ling Fan, coming from IBM. I am in charge of Asia Pacific wireless solutions, including RFID. Just a response to your question about how Hong Kong participates in mainland China business. We know recently that the Hong Kong government and the Guangdong government already formed alliances with the next generation of logistic support which means more RFID compliance solutions. That probably also has to connect to some platform for the hosting services, to support your earlier question of SME, the small-medium business. So that alliance is already set out. IBM is a partner. We are working in technology on the platform design, so just the information sharing for this team.

For RFID, we thought that has to be including the evolution phases. Phase one, compliance is most important today. So what the US have today, in the airport, checking the baggage with RFID. We will see the model, Hong Kong Airport, Beijing Airport, Shanghai Airport, immediately we need to comply the standard of the US. Compliance is quite important in phase one for every partner, every company, every SME. If you want to participate in a global market, as an SME, if you want to comply as Wal-mart, as part of the suppliers, next year you have to comply with the rules. We thought that phase two should be advanced services and advanced applications. If any SME or enterprise wants to increase their productivity efficiencies or reduce the costs they have to develop new and advanced applications by using the latest technology including RFID. We see compliance as number one and advanced applications as number two for any specific industry. The third phase we will see will be the new business model, the new business transformation complying with any RFID technology. This could be the evolution for any enterprise and SME including the Chinese SME in Guangdong. That is how we see the market changes. We work quite closely with Chinese leaders like Sparkice and also some EPC leader based in Shanghai. We are looking forward to co-operating with any team here for Asia-Pacific business in the RFID area.

MR HAMMOND: Thank you. Any more?

MR ZENG: I think if Hong Kong does not follow the interoperable models then I think it will have three futures. The first is if all Asia has one standard then Hong Kong becomes isolated. Second, Hong Kong plus EPC, Europe can convince the Chinese government to have one global standard. The third future is Hong Kong eventually, the

standard will be taken over. If you look at the Asia Global Crossing recently have been taken over by CNC, eventually Hong Kong Telecom will have a lot of media rumours about being taken over.

Once mainland China becomes more mature, once the Asian, China, plus Japan, plus Korea, become more powerful, the way for Hong Kong has to be very clear. In my view the Hong Kong real asset price recently had a big drop in the past five years. They do not have a clearly intellectual strategy. Because what they want to be, become a trading hub? Eventually if all the Asian standards are not Hong Kong compatible then they will probably go to Shanghai. Then you lose all trading alternatives. If all the containers can get data synchronising from Shanghai but not data synchronising from Hong Kong what will happen? It is very serious what I am talking about.

MS LIN: I am afraid I will not agree with Edward's comment. I certainly understand from a China perspective that there is a lot of discussion right now standards, of course from different perspectives. Even among the three countries, China, Korea and Japan, we do have quite a bit of discussion between different government departments. But I think China being the largest manufacturer, same as Korea, same as Japan, I have also come across tremendous support, the Korean government giving support to EPC, as an example. So my belief is I think your earlier comment is a little bit presumptuous. I think China, being the largest manufacturers, in terms of economic or in terms of their contribution to global commerce, certainly play a clever game in the sense that if global commerce is moving that way -- I agree with IBM's observation -- because the first phase at the moment is merely the global leading companies are driving it to happen. So if a manufacturer in China can be saying no to this global client, I am afraid not.

Of course, the most important thing for China, for all the country, it is not just an Asian thing, is to participate in this global game. I think ISO would be a right form as well because eventually global standards will need to be rectified by ISO and I agree to that process. But I think it is a little bit presumptuous to say that we will have our Asian standard. Certainly from my observation, from my talking to different countries, including China as well, I do not get that kind of impression.

MR HAMMOND: Differing views. I think what we are saying is in a way it is about compliance but standards evolve. What we are looking for here is a global standard that will satisfy both ends of the equation, the buyers and the suppliers. I think it will head that way and we will have a far better technology platform to deal with these sorts of issues and one of the assets of the DTTN is that any to any translation and conversion capability. So even if there are disparate standards, we plan to handle them in Hong Kong. That is not to say that Hong Kong in my opinion is in any way planning to establish its own standard. Clearly it is not in a position to do that and it never has been in the sense of communication standards or messaging standards. It is a participant in a logistics sector, it is a service industry which responds to its customers. So it is going to follow the customer direction in my opinion.

That is all for the first session. Thank you for your participation from the audience. Thank you in particular to our speakers. If I could ask you to give them a vote of thanks first. We will begin again at five past. Thank you very much and thank you to the speakers.

DR URE: Ladies and gentlemen, we will start again. The theme of the second session is very much the theme of RFID -- standards, technologies, research and development that is going on, especially in Hong Kong. I am sure that some of the topics and themes that were raised in the first session will be raised in the second session here. Our speakers are going to be Anna Lin, the chief executive of the Hong Kong Article Numbering Association, well known to everybody in this room. Lawrence Cheung who is the principal consultant at the Hong Kong Productivity Council for RFID. Again I think Lawrence needs very little introduction from me. He has been speaking at many TIF events over the years. Finally, Jonson Yue who is the senior marketing manager of Hewlett Packard. Jonson is going to present one or two case studies in RFID. Without further ado, Anna, I am going to invite you to give your presentation.

MS LIN: Good afternoon, ladies and gentlemen. First of all I would like to thank John for inviting me to this forum. This is my second time attending the TIF forum. Actually it is very good -- it was about this time last year I think -- to have an annual update of what is happening is actually interesting. Last year I was presenting in October even before the launch of EPC Global in Hong Kong.

My presentation, basically, I would like to share some of the background of RFID/EPC in case some of you have not heard about it. But I am pretty sure this is the hype at the moment so I am not too sure whether this sort of historical review might be a little bit boring. I would like to explore the latest developments as well as the future developments.

For those of you are not familiar with our association, just to quickly sum up, Hong Kong Article Numbering Association (HKANA) is a non-profit industry support organisation established by the Hong Kong General Chamber of Commerce in 1989. I met some old faces in this forum which reminded me how old I am. I hate to count the number of years but we are actually celebrating our 15th anniversary this year. We are a supply chain organisation. Our association's role is really to promote and facilitate adoption of supply chain best practices, enabling technologies and global standards. Maybe the next slide will explain a little bit better the global supply chain enabling technologies that we are promoting at the moment. Globally we are the local chapter of EAN International, which is represented in over 133 countries or economies worldwide. Of course, globally we have millions of corporate members but in Hong Kong we have only 4,000. This is just a diagram but I hope it explains more how the supply chain enabling technologies work. Basically, it provides the standard to connect the physical flow of goods, which is represented by the bar code which we are very familiar with, to the e-messaging, whether it is EDIFACT or ebXML. In between the connecting point would be the global numbering system. Of course I try to summarise it in a very simplistic way. Certainly there are different number coding schemes, different message formats. Even in terms of macro we have different types of bar codes. There is the linear bar code which everyone is familiar with in the supermarket but we also have the two-dimensional bar code and more recently the RFID tag.

Let us go back to concentrate on EPC Global Hong Kong. As I said, EPC Global was officially established in October of last year. EPC Global Hong Kong was founded in March this year. The main role of EPC Global in Hong Kong would be the following areas: firstly on the awareness side, there is a lot of discussion and interest on this EPC/RFID so we certainly need to provide the training on this subject.

The other area is the EPC standards which everyone is interested in, particularly when it comes to some of the regulatory alignment. Later on I will explain that. One of the important regulatory alignments will be the use of frequency. At this point in time we are very thankful to the government auditor who has been very speedy in aligning this regulation. Another area will be solution enablement. The pilot case, the industry buy in and then eventually on the EPC -- this is to give you an overview of the kind of the scope of work in Hong Kong that we are committed to do. As I said, this is also my second presentation on the same day. But as we all know, our finding is not new technology. It has been around since WWII, for military purposes, to distinguish enemy planes from our friendly planes. Of course, in Hong Kong we have a lot of RFID

applications. There are the familiar ones like Autotoll, Octopus. I think I do not need to explain. I think every one of us is using Octopus. Some of us, when driving, we are using Autotoll. Even for the Fisheries Department, the docks, they are using RFID tags. Singapore has always been promoting its RFID project, particularly to tag the Arowana fish which cost $10,000, an expensive fish that they need to put a chip into the fish.

Now, go back to the background of EPC. RFID is not really something new but currently it has created a hype. At the end of September I was attending the EPC Global US conference in Baltimore. There were 1,800 people attending. I think some of you who went there would have been very impressed by the numerous speakers, not only Wal-mart, not only P&G, not only Gillette but also the US Department of Defense, Boeing, Airbus, many companies were there to present. They also had a big demonstration to demonstrate how collaboration on the EPC network would work. Then in early October I was in Taiwan, speaking at the EPC Global Taiwan conference. We officially launched EPC Global Taiwan, officiated by the Taiwan government. Again, they had 600 people attending. Then in mid October, in Shanghai, they held a second EPC China conference where there were over 700 people attending and over 90 exhibits. The representative of the Ministry of Science and Technology, of course the Standardisation Bureau, so you can see there is a lot of hype around it just within a matter of weeks. So the background of EPC actually started off form the research project initiated by MIT which was funded by a lot of the Fortune 500 companies together with the standard organisation EAN.UCC. It was officially doing the research work until the time that some of the leading users such as Wal-mart, the US Department of Defense, Target, they thought it was time to put research into implementation. So EPC Global was officially formed in October of last year to take the technology into the global marketplace. This is how it is being structured. The Auto-ID Lab does not only consist of MIT, it actually consists of six major universities in the world including MIT, including Cambridge, including Fudan, Adelaide in Australia, there is another one St Gallen in New Zealand and a Japanese one as well. This is from the research to the industry implementation. So we have EPC Global as well as leveraging from the global infrastructure of the EAN community. EPC Global is a user or industry driven non-profit centre organisation, pretty much like the current adoption of the bar code or e-messaging. However, there is a process, because even from the user-driven side, there is a process that will go to the ISO for ratification. I think it makes sense. There is a process there, but at the moment I must say that even in EPC Global, later on I can show you, there is a process of developing the global standards. Over 1,200 people are currently involved in developing the standards in different working groups. Certainly the direction is while this is industry user-driven the process will go through the ISO to ensure that it can have the ratification going back to the national governments.

This is the major scope of the EPC global. Of course on the research and development, there are still a lot of areas to be researched. That is why every year there is something chipped in by 133 member organisations into the Auto-ID Labs for ongoing research. They are different initiatives with special interest groups within that. On the standards side there are primarily four major working groups. Recently they also introduced the architectural committee looking into the infrastructure. As I said, over 1,200 individuals are currently involved in this process. Apart from that, also it is needed to manage the EPC Global network, the numbering scheme, the optic naming service as well as to be launched certification services. Because of the time I do not aim to talk about the technical components of EPC standards. I think last year when I talked

about that I may have covered that. I thought this year I would give an update on the global development. Of course, because of the mandate of driving adoption as early as January 2005 so leveraging on 133 member organisations or local EPC chapters, there is a need for doing a lot marketing awareness as well as local implementation support.

There is another interesting area that maybe consumer pressure groups would be very interested. Lots of people are very concerned about privacy. So within EPC there is also a public policy group. Basically they follow guidelines. This is the tag with the symbol -- this is a means to alert the consumer that this item is EPC tagged. Then at the same time this is to give choice to consumers that if you do not want to have this tag with you when you walk out of the store then you can do that. This is really to address some of the very controversial issues on privacy.

I understand more from an Asia perspective. Perhaps privacy in this part of the world may not be as intensive as in the US and Europe. We also have to know that in order to do that we have to trade off some of the business benefits. For example, you have warranty, once you take this off, the warranty will no longer exist, the warranty service will no longer exist with the tag information. Within the short period of time, from October to now, in less than a year, who is behind all of this? Why is it that every other week, apart from in the US, Europe -- Asia probably has a lot hype and attention on this EPC/RFID. In all the news, we can see that Wal-mart is driving it, the Department of Defense is driving it. What is behind it? This is really the global structure. Everyone can participate. It is an open standardisation process. You can see that from different working groups, once you sign the IP thing then you can participate in the group to develop the standards. As I mentioned, we have the ARC, the Architectural Review Committee, the Business Steering Committee, the Technology Steering Committee, the Auto-ID Labs that provide the ongoing research as well as the Public Policy Steering Committee. Within that there are numerous working groups.

From the user perspective this is certainly more than Wal-mart alone, although Wal-mart itself is already a very big driving force. These are some of the names who have been supporting Auto-ID Labs since the early days. We are all familiar with some of these brands. Together they actually constitute 25 per cent of global commerce. This is something I do not think we can ignore easily. That is also the reason why I said that China, Asia -- it makes sense for a lot of the region to contribute to this kind of -- to reap benefits from this global commerce momentum. Of this 25 per cent global commerce I was told -- I do not know how to say it, it is 6 plus 12 zeroes, items have been transacted every year. That is the reason why a lot of the Forrester report, a lot of companies say, "If every one can be tagged, wow, it is quick business." A year of progress. This is not something just in the research lab. There is a clear mandate set by a lot of these multi-national companies, for example Walmart's mandate of 200 companies by January 2005. The US Department of Defense, the same. The FDA recommends that this would be a useful anti-counterfeit weapon. Target, Amazon, Tesco. It is not just the US. Some of the clear mandates set by leading European buying groups as well. This is not the end of the list. I know that there are some companies who are doing something they may not want to share as well. These are some things that have been happening in the past year.

Some of these figures I got before the Baltimore meeting so for example, when we are talking about the total -- how many companies are EPC subscribers? Right now I think it is over 500 companies on a global scale. Of course the US has been leading its

adoption. If you look at Asia-Pacific we are not doing that badly although most of the participants are the solution vendors because they seek opportunity in it. I would say that we are actually quite pleased, even this figure, 15 for Hong Kong, is outdated. We actually have more than 20 technology partners in Hong Kong contributing resources and support in this EPC momentum. Certainly it is not a choice, it is something that the industry is moving in full steam. The vision of the industry is to create an Internet of things. So to do that, I think we need to understand the vision. We need to have a very small, very inexpensive tag that could go down to the item level, serialised level. This is the vision. We need to have a network to connect all the different inexpensive readers. Basically, the vision is very cheaply tagged, read by inexpensive readers, down to the serialised level, and it has to be multi-industry and interoperable.

So with that, the EPC network, which I think in some of my previous discussions about the object naming service, the EPC et cetera, will constitute some of the components to make this network work. We must understand that EPC is much more than just the RFID technology. Basically we tried to standardise the reader and the tag's protocol from active tag to active tag but more importantly we have the protocol, the standards for the EPC network so the people could collaborate and share information with the EPC network. And an analogy with the object naming service is like a DNS. From the network perspective, this is a distributed mode and from the network perspective, this is really to give a clear view into the supply chain of whereabouts the product is to give us the visibility. One of the key things we are addressing at the moment is full visibility in the supply chain whereby if different trading partners could collaborate using this for communication, this is a vision that people are driving at the moment. Some of the innovative ideas of sharing in-store inventory to help speed up new product introduction will be something that some of the supply chain partners are very keen to achieve.

Even from a manufacturer's perspective there are implementations that have demonstrated some of the benefits, for example the inventory visibility, how to improve efficiency as well as the fulfillment. But the benefits actually extend beyond four walls. They extend to information sharing with your trading partners, upstream as well as downstream. Then we are able to collaborate and streamline the supply chain processes to be able to speak to the market. I will not go into the details. These are just some of the case studies that have been documented before. I think most of us are familiar the Gillette case but certainly there are others of freight forwarding, manufacturers, case studies being documented. I would like to go back to some of the latest developments in Hong Kong. Some earlier speaker, maybe Peter, has already said that as well. Certainly from a regulatory, a government perspective it is a very important subject. For example, we are very pleased that OFTA is doing the consultation right now and trying to fasttrack dual band. The EPC Global recommends 860-960 and the auditor in Hong Kong OFTA is now fasttracking consultation in the dual bands of 865-868 as well as the 920 series. We very much welcome this. On the other hand, we are all aware that the government would be establishing R&D centres next year and one of the potential key set outs in these centres would be the logistic and enabling technologies where RFID/EPC would play a key role there. I think another speaker has already mentioned that in the short term, actually there is the Guangdong and Hong Kong co-operation scheme whereby we encourage projects between the two places and RFID/EPC is a key focus. For some of the future initiatives coming up, Generation II protocol, certainly it

would be something everyone is watching. Although it is highly controversial I think an agreement has been reached. I understand that it should be in good progress for release in the fall. Once that has been released, that would be a process to go to the ISO as well as for the EPC Global certification.

Everyone talks about China. As I mentioned in my earlier comment I understand this is still a different government. Countries like China, Korea, Japan, they will never be single view. I believe that governments would also like to assure that they align to their competitiveness in a global market. I do not have a single doubt about it. From the different talks I believe China would be supportive of a global standard. What we would like to encourage China to do is to have a more proactive participation in the standardisation process. It could be aligned with ISO as well. I think the process in China could also be speeded up.

As a conclusion, we are not saying that EPC -- I think when we look into the development of EPC it is broken up into three phases. The current phase should really focus on the supply chain. The technology, standards already for the supply chain that we could try out. Of course, down the line in two to five years there will be innovations in store. Then of course, down the line in eight to ten years, when the cost of a tag can really be affordable to 1 cent, or 5 cents then there will be innovation of the smart appliances. That is fairly visionary. That might be something that we may see. Even a cheap egg will have a tag on it. Thank you very much.

Telecoms Infotech Forum (October 19 2004)

EPC
An Update

Anna Lin
Chief Executive, EPCglobal HK/HKANA

EPCglobal

Introduction to EPC/RFID

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Future Dev

Agenda

- EPCglobal Hong Kong Organisation
- RFID/EPC – a historical review
- EPC – is it a choice?
- Commercial Implementation
- Latest Development
- Future Development

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Hong Kong Article Number Association (HKANA)

- Founded in 1989 under General Chamber of Commerce
- Local Chapter of EAN International
  - Supply chain best practices, technologies and global standards
  - Global numbering (GTIN, GLN, SSCC)
  - Bar code and label format standards
  - B2B messaging standards (e.g. EANCOM/EDIFACT, EAN.UCC XML/ebXML, RosettaNet)
  - Global Data Synchronization
  - EPCglobal/RFID standards
- More than 4,000 corporate members
- More than 1million corporate members worldwide in over 133 countries/economies

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Global SCM Standard

*connecting the **physical flow** of goods to the **flow of information***

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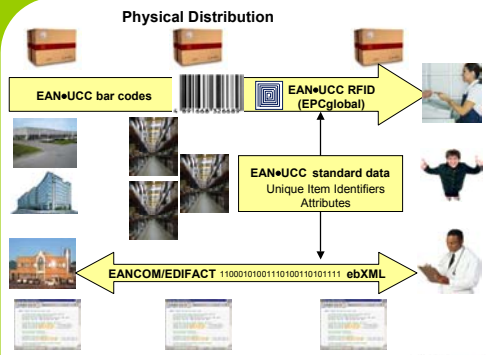

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EPCglobal Hong Kong

- Founded in March 2004 under HKANA
- Awareness and Resource Centre
- EPC Standard Development
- Regulatory Alignment
- Solution Enablement
- Pilot Case and Industry Buy-in
- EPC Certification

EPCglobal Hong Kong

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RFID

- Mature technology invented 50 years ago
- Used for military applications during WW2
- Have been too expensive for commercial deployment

HK Application

- AutoToll
- Octopus

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EPC

- **EPC is a standard NOT only on RFID, but the whole concept of RFID application on supply chain and sharing information across the EPC Network**
- **Proposed in 1999 by MIT Auto-ID Lab with support from over 100 MNCs, universities and EAN.UCC**
- **Global standard formally released in Oct 2003**
- **Revive RFID technology by introducing new commercial potentials by:**
  - **Standardizing technology**
  - **Lower Entry Barrier**

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EPCglobal Evolvement

AUTO-ID CENTER

Partnership between 100 global firms, including founders:
- Uniform Code Council
- EAN International
- Proctor and Gamble
- Gillette

EPCglobal
Global:
- Standards Development
- Adoption
- Brand management and marketing
- Policies (Privacy, Intellectual Property)

EPCglobal Member Organizations
Local:
- 130+ Member Organisations
- Member communication
- Member Support
- Training and Education

AUTO-ID LABS
Research continues

Research → Industry Implementation

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Innovation to Implementation

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AUTO-ID CENTER 1 → EPCglobal 3 → ISO

2 ↕ GSMP EAN • UCC

Original research at MIT with over 100 global companies, EAN International & UCC

Relevant EPC standard components are submitted to the ISO process

EPCglobal was established by EAN International & UCC to lead the development & adoption of industry-driven technology standards for EPC

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EPCglobal Scope

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1. **Research & Development**
   - **In collaboration with the 6 Auto-ID Labs**
2. **Standards**
   - **Process for Hardware & Software standards**
3. **Manage the EPCglobal Network**
   - **Numbering system**
   - **Object Name Service**
   - **Certification Services**
4. **Driving Adoption**
   - **Marketing, Awareness, Business Development**
   - **Implementation support**

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EPCglobal Consumer Information (Public Policy)

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- Products tagged with EPC tags should mark with one of the below labels as well

- What do these labels mean?
  - ***(Consumer Notice)*** These labels are to let people know that EPC tags are present on or within the packaging of the products.
  - ***(Consumer Choice)*** Consumers can throw the tag away once the product is brought. Products with EPC tags are NOT tracked outside the store where you bought them. They do not contain any information regarding you or what you bought. They are only used by the store and the manufacturer of the product.

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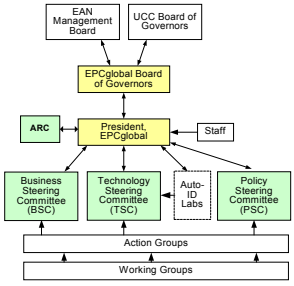
Who's Behind It?

EPCglobal and Its 130 Member Organisations



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Who's Behind It?

103 Industry members contributing to **25% of Global Commerce**

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Is It a Choice or Simply Co-incident?

WAL*MART

- Requiring EPC-compliant RFID Tags on all Case and Pallets
- Pilot Plan for 2005: 3DC's in Texas with limited stores
- Deadline for Top 100 Suppliers: Jan 2005
- Deadline for All suppliers, All sites: 31 Dec 2006

METRO Group TARGET CORPORATION

- Top 100 Suppliers by "Spring" 2005
- All suppliers by "Spring" 2007

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Is It a Choice or Simply Co-incident?

DEFENSE

- User of Active and Passive RFID since 90's
- 30 Jul 2004 released Final Policy on EPC Mandate
- Require suppliers EPC tags on lowest possible piece part/case/pallet packaging by January 2005
- http://www.acq.osd.mil/log/rfid/index.html

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A Year of Progress: Industry Support

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- **Wal-Mart – June 2003 – Top 100 suppliers by January 2005**
- **DoD – October 2003 – Top 100 suppliers by January 2005**
- **FDA – October 2003 – Suggests RFID as a weapon in battling counterfeit drugs**
- **Target – February 2004 – Top suppliers by Spring 2005**
- **Albertson's – March 2004 – Top 100 suppliers by April 2005**
- **Tesco (UK) – April 2004 – Top suppliers by September 2004**
- **BestBuy – August 2004 – Major suppliers by January 2006; all cases and pallets by May 2007**
- **Metro Group – 100 top suppliers tag by November 2004**

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Some numbers

- **6,000,000,000,000 or 25%**
  - **Number of goods per annum in 2003 for Auto-ID Center Members**
  - **25% of global commerce**
- **13 Billion USD or 10%**
  - **How much Wal*Mart purchased from China last year**
  - **10% of total US import from China**
- **1 out of 4**
  - **25% of global out of stock is cause by bad supply chain management**
- **1 out of 5**
  - **20% probability of OOS for top 2,000 selling products in US**
  - **75% is due to tardiness from back room to shelf**
- **Under 50%**
  - **If your inventory forecast is 70% accurate, you are doing very well**
  - **Most companies are correct less than 50% of the time**

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Total Subscribers of EPCglobal

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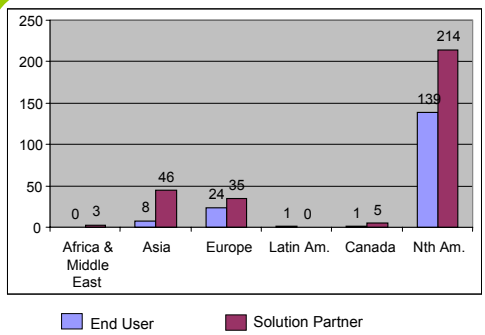

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EPCglobal Subscribers In Asia Pacific

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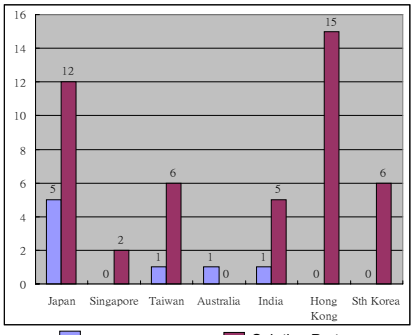

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Is It a Choice or Simply Co-incident?

What is EPC?

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EPC Vision

"Create an Internet of Things"

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EPC Implementation Requirements

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Small, inexpensive, high performance tags

Networked, inexpensive readers

001
002
003

Serialized item tracking

Straightforward link with current systems

Global, multi-industry interoperability

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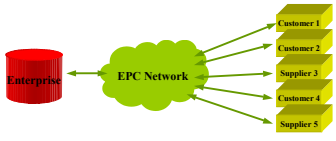
Unified EPC Compliance



- **Unified interface with supplier and customers -> Cheaper integration**
- **Structure supply chain management**
- **Lower cost of supply chain management tools**
- **Faster and more complete access to information**

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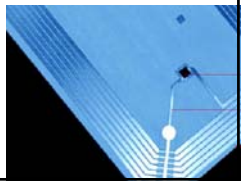
EPC Network Offers Solutions

- **A clear view into our supply chain**
- **Show us all our products…**
- **How much we have, and will need…**
- **Where it is…**
- **Where it needs to be…**
- **And when/where it goes missing**



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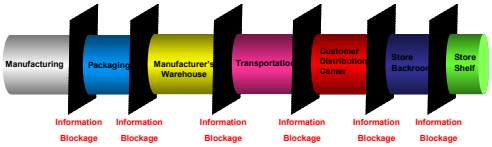
Before EPC



- Information barrier / lags
- Separate process for object identification (e.g. barcode + labour)
- High cost in maintaining service level
- Low customer loyalty

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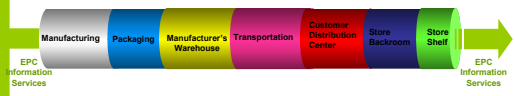
EPC Visibility



- Real-time and synchronized information flow throughout supply chain ("An Internet of Things")
- Visibility regardless of geographic location
- Bi-directional information sharing
- Win-win strategy for upstream and downstream partners
- Stickier Supplier/Customer Integration
- Higher customer satisfaction, hence loyalty

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Manufacturers' Saving Within 4 Walls

Inventory Visibility
- Better inventory track
- Throughout warehouse and distribution systems

Labour Efficiency
- Reduced circle counting
- Eliminate manual process

Improved fulfillment
- Reduce shrinkage
- Improved dock and truck utilisation
- Improved product traceability
- More precise recall capabilities

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Manufacturers' Saving with Trading Partners

Information Sharing
- Greater visibility
- Better traceability
- Improved Data Accuracy

Overall Efficiency Gain
- Reduced inventory level
- More efficient and accurate replenishment
- Better customer service
- Reduce reverse

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Measurable Results

Truck-loading pilot at Food Manufacturers warehouse supported by SAP and Intel (Metro Group Initiative)

Projected Benefits:
- Cost saving of 16,000 EUR per year for one single warehouse
- Average saving of 20 EUR-cents per pallet

Auto-ID Technology for Flight Transportation By AIDC Freightways supported by Accenture

Pilot Results
- Increase number of pickup and delivery actions by 10%
- Increase of Delivery Actions of $4.5 million

Gillette Warehouse Pilot Project to Track 100% of all Venus cartridges (case/pallets) within 4 walls.

Projected Benefits:
- Cost saving of US$ 305,586.67
- Return of Investment (ROI) : 158%

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Latest Development in HK

- **OFTA fast tracking frequency (865-868 MHz & 920-925 MHz) & import/export regulatory approval**
- **Guangdong / HK co-operation platform**
  - **EPC/RFID applications among 6 identified key focus areas**
  - **Readers & Tags, Info-sharing infrastructure, industrial and commercial applications**
- **R&D Centre to be established on Supply Chain and Logistics Enabling Technology with EPC/RFID as key focus**

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Future Initiatives

- Gen 2, is on final draft consultation and due to be released by EPCglobal in Quarter 4, 2004
- EPC Certification Program to be announced Q1 2005
- EPC to be submitted to ISO Standardisation process upon C1G2 release
- China to consider EPC as national standard upon EPC becoming ISO Standard

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EPC Impact

« Supply Chain » Benefits	« In-Store » Benefits For Consumers	« At Home » Benefits For Consumers
Reduce OOS	Product available on shelf	Smart appliances
Reduce inventory	Perishability monitoring	Recall communication
Detect shrink	No-scan check out	Simplified recycling
Detect counterfeit	Interactive shopping	
Labor efficiency / accuracy		

Near-Term 6 – 18 Months → **Medium-Term 2 – 3 Years** → **Long-Term 5 – 10+ Years**

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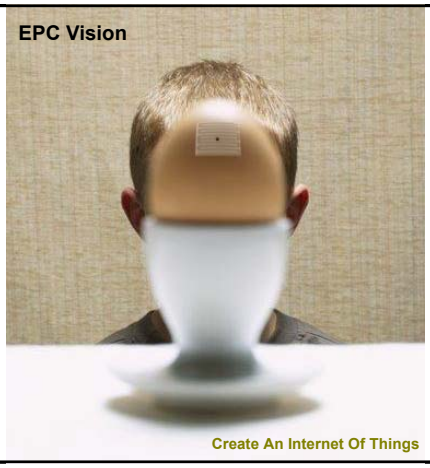
EPC Vision



Create An Internet Of Things

DR URE: Thank you very much, Anna. I thought that egg at the end, I could not work out whether it was an egg or one of our speakers. Actually Anna also mentioned the fact that she went into some technical of the details and you can find those on the website which is mentioned in the first paragraph of the briefing paper, that is the TRP website. All presentations from last year are available on that. Our next speaker is Lawrence Cheung from the Productivity Council.

MR CHEUNG: Good afternoon everybody. Today I will probably speak a bit more on the application side of how Hong Kong will apply the RFID technology. I think Anna has eloquently described very well what RFID is and I probably would not repeat too much. Why Hong Kong? I think Hong Kong would play a very strong role in the development of RFID and the application of RFID. I think, as Anna already mentioned before, Hong Kong is already one of the biggest users of RFID. Whether you are driving or going onto the MTR, you will use an RFID. Or if you own a dog you use RFID. We have already 10 million Octopus cards on the street and more than 100,000 cars using Autotoll.

So, apart from the fact that we are familiar with RFID, the fact that Hong Kong, being the logistic hub of Asia, we are still number 1 in terms of the volume of air freight and also the volume of sea freight out of the Hong Kong ports. So the application of RFID in logistics is tremendous. Logistics is not something you can move. Because of the fact that our hardware is in Hong Kong, it is not easily relocated to somewhere else. Although as you know, the ports in China, like the Shanghai port and also Yantian port are catching up very quickly. In Hong Kong the port flow of cargo is growing about 3 to 5 per cent every year but in Shenzen it is growing at 40 per cent every year, in Shanghai it is growing at about 35 per cent. So in three or four years time, in terms of volume, they will probably catch us up. Still in Hong Kong we have a lot to offer. It is not as though Hong Kong is facing doom and gloom. The fact that Hong Kong has world-class financial and banking services, together with our managerial skill and our rule of law. In totality as a package, Hong Kong still has a very strong role to play in our region. Also the fact that we have over 60,000 manufacturing facilities in China owned by Hong Kong people, we are actually employing more than 12 million people across the border. Together with CEPA, Hong Kong will still be a very advantageous place to go.

How could RFID help to maintain our importance and competitiveness in terms of logistics, manufacturing, financial and services? I think we must look at the Hong Kong role in our region, across the border in the Pearl River Delta it is the factory of the world where a lot of the manufacturing capacity are being placed. As a matter of fact, a lot of Hong Kong industry own factories in China. Most of them are OEM manufacturers, they receive orders from overseas and they do the manufacturing in China. The fact is that they are facing fierce competition, not only from companies in Hong Kong but they are also facing fierce competition from Chinese manufacturers. So the actual cost advantage of relocating factories to China is diminishing. What can we do to maintain our competitiveness? A lot of them are moving upstream to become OBM or ODM, original branch manufacturers or original design manufacturers. The fact is that they are squeezed from both sides. On one hand in China the cost of manufacturing is becoming more and more, the cost of labour is getting more expensive. In some places they have a shortage of labour, in Shenzen and Dongguan. On the other, buyers from overseas are always squeezing and trying to cut down to bare bone the cost of the goods. It is apparent that in order to cut costs then logistics may be the remaining low-hanging fruit to reduce cost for manufacturers. It is because from some of the costing analysis now about 35 to 40 per cent of goods come from logistics and logistics related services. So if we are able to do something in the logistics area we are able to do something about the cost of goods. Something we can do is information automation. When we move cargoes, cargoes are with no brains, like a lot of our bosses scolding our employees. Cargoes are objects with no brains, movement depends on the availability, also the

accuracy of corresponding information. Information by itself without sharing is worthless. In order to make information worthwhile and important we must share the information.

So along the entire supply chain from manufacturers to logistics service providers, across to customs, to the retailer and distributor, wholesaler. If we have means by which to share information about the cargo and the corresponding information as the cargo moves along in the supply chain then it would give tremendous accuracy in terms of the data and also much better grasp of the inventory level. So, as you know, a lot of investment has been placed in process automation or actual automation in terms of hardware but the software or information automation is important so the process automation in supply chain must therefore be accompanied by information automation from end to end. So what is the key for this information automation? It would require the application of technical sophistication, it would require the application of electronics, information and communications technologies to facilitate the end-to-end track and trace. That would reveal that it would play a pivotal role in the supply chain automation. In order to do track and trace we must be able to do the data entry only once and it must be done right. In the past we had a lot of means by which we could do a lot of registrations, particularly in China where the labour cost is cheap, but the manual registration of cargo information is tedious, error prone and costly. Costly not in terms of labour costs, but in terms of the fact that if we have error, error will continue to propagate throughout the supply chain. If we are able to do it right in the beginning then the benefit will be rippling along with the information down the supply chain. What we see is that automatic information or application technology will be essential in order to minimalise the human error.

There comes RFID. I probably do not need to mention RFID much but for those of you who have not seen an RFID, that little cross sign here is one of the many RFIDs that are out in the market. That RFID is a tag which has an adhesive which you can stick onto a carton so when the carton moves along the supply chain you should be able to do track and trace then. That is blown up in this bigger picture. The actual yellow part is mainly antenna. The actual RFID tag is this small thing here. Essentially, very simply, the RFID, when they are put onto trays, cartons or pallets, when they are being pushed along through a reader then the reader will be able to read all the information about the cargoes on the pallet. The important part about RFID is that it does not need to have line of sight and it is able to do multiple registration or a multiple read. That would be an advance in comparison to when you have a bar code.

With bar codes, when you have a pallet of cargo boxes and people want to read the bar codes they would have to go through all the boxes. That would be tedious and error prone. If we were able to put RFID onto a pallet of carton boxes then all of the cartons on that pallet would be able to be read simultaneously. On some of the new developments, in one second some of the readers are able to read more than 1,000 tags per second. Unique identification of RFID allows us to identify items, boxes, pallets, containers or even trucks uniquely. The range of RFID can range from 1 centimetre which is similar to what we are using Octopus with, to up to 500 metres, which are more like active tags. They are more like a mobile phone. The line of sight is not important so we will not need to have line of sight to read the RFID and we do not need to present the item to it sequentially so you can read it in a multiple way, in the sense that you can

read many of them at the same time. There are two types of tags essentially, one is called the active tag. The active tag would have a battery within the tag itself. It has a much longer range from 30 metres onwards. And because of the fact that it is more sophisticated it would usually cost more. They are usually placed in things like containers and in places where it is not a controlled environment like a logistic park.

For a passive tag it is more like the tag that you have just seen which are being put onto carton boxes. Those passive tags usually have a short range, usually under 5 metres. Because of that it will be less than $1, in bulk it will be less than 50 cents. Usually it will only hold a small amount of data. For an EPC tag it would store up to 256 bytes of data. RFID tags, some of them can store up to 2-3 kilobytes of data. The drive for growth of RFID, some of us probably would have gone to RFID seminars every week. I must say I go to one every week because I need to speak on this topic! Why is it so hot? The main reason is that it is driven by the buyer. In order for new applications or new technology to be adopted by the manufacturers there are only two means. One is by the buyer. If the buyer wants that to happen, it happens. The other is by a government mandate, if the government wants something to be done then it has to be done. So for RFID tags like the EPC, because of the fact that Wal-mart is driving the use of it, mandating that by April 2005, for the goods going to the top six distributing centres in the US need to be tagged, then it will happen. So everybody is actually waiting for that to happen and see what will be the benefit of it. I think that will be something that everyone would pay attention to. The other thing, like government regulatory requirements like in the US, because of 9/11 you have a lot of heightened security measures that would require, let us say, the manifest of cargoes going to the US to be submitted to the US Customs Office 24 hours before the shipment. Things like that will drive the use of RFID.

The third thing that drives the RFID is the unification of standards. Because if you have cargoes moving across the world, from one end of the world to another, from Hong Kong to Europe, from China to the US, if you have different standards of ID then it would be very difficult to track them. So if we are able to have an international standard such as the EPC then it would help tremendously the tracking and movement of cargo.

The other driver for RFID growth is the advances of RFID technology. Because of the Auto-ID centre and their research, the actual range of RFID has increased significantly in the past few years. It used to be the fact that RFID could only be read within, say, 1 or 2 metres. Now the RFID, for passive, can be read up to 5-10 metres, or active, up to 500 metres. The range of it has increased significantly. The other is the multiple read of RFID as I mentioned before. What used to happen is, like our Octopus card, you would need to go to the gate one by one. Imagine if you go to a room where you do not need to queue up for the gate and it just reads all your Octopus cards simultaneously then you probably do not need to queue up for the gate every morning.

EPC, I will not go through it in great detail. One thing I want to mention is that EPC is much more than just RFID. The analogy is it is like our Octopus card. Octopus is much more than just a smart card. The success of the Octopus system is the fact that from the front end you have a very reliable smart card system and at the back end is the actual clearance of the money being distributed along among all the players. That particular system is very successful. So in the same way as EPC, the actual tag and the

reader is at the front. The actual back end of it with the exchange of data and information is much more than just RFID. Some of the existing uses of RFID and EPC in Hong Kong. From what we can see, from our meeting with manufacturers is that they are all very interested in our EPC and RFID. Not many of them are actually wanting to be the first mover. That is true to form in terms of Hong Kong people who never like to be first mover but when one starts to move everyone starts to move. Because of this fact I think that is the reason why many of the service providers are all very well prepared for that to happen. At this moment, from what we can see is that, in our conversations and contacts with the manufacturers, they are all very interested, they want to know what is going to happen in April next year when Wal-mart starts to use RFID and see how they benefit. A lot of people are concerned about the cost. The cost of 50 cents per tag which is being put onto the box, it will be like putting a $5 note onto each box. So for them it will be cost. How are they going to cover the cost? Who is going to pay for it? That is something manufacturers are concerned about. There are some sporadic projects going on with manufacturers. From what we see the textile and apparel industry are the first movers but there are some others going in as well. I think the manufacturers, in order to convince them to use EPC and RFID we must allow them to know that the $5 or 50 cents that they pay for the tag, we need to convince them how they can earn 60 cents or save 60 cents out of the use of the RFID.

In terms of logistics I think they are more interested. I think there are a lot more pilots going on there. Some may be more open than others. From some of those which are more public, some of you will know that the Airport Authorities are going to trail the passenger baggage system so the tag that they will put on our baggage will have embedded RFID. The use of it is very beneficial to AA because what used to happen is that they would have a bar code onto the baggage tag and the read rate is very expensive. Bar code reader will be only 50-60 per cent. With RFID tags, what I heard in the trial is that they can go up to 90 per cent. On the MTR they trialled materials to track and trace some of their concrete slabs. In some of the third party logistics services they are considering how to help the small and medium manufacturers in china, that is how to slap and ship. That is how they slap the tag onto their products and help them to ship it.

So the potential deployment in Hong Kong industry in all facets of industry can be used, from manufacturing, logistics and transportation, warehouse and retail. What we want to advocate is that the tagging of RFID must be done at source because that is where the cost is cheapest but the benefit of it is the maximum. That is, the actual accuracy bit that is being given by the automatic track and trace would be able to ripple through all along the supply chain as the actual cargo moves from the supplier to the buyer.

One thing I want to mention before I finish is the use of RFID in logistics and transport. I think one of the main bottlenecks in Hong Kong, I am sure all of you will have known, is the heavy land-based mainland-Hong Kong container traffic. At the end of every month you see long queues of traffic going southbound and going for shipment in the Kwai Chung terminal. Every day, on average we have 35,000 trucks going northbound and southbound of the Chinese border. If we are able to use RFID to help the clearance of customs and also make use of RFID to allow them in pre-arrival clearance, in inland transit and also help them to reduce the queuing time in the container terminal, then the number would be reduced. We are actually partnering with

the university to look into how to make that work. Some of the potential benefits of it would be the automatic generation of cargo manifest and significant speeding up of cross-border traffic. For some of the shippers and buyers you would have very accurate inventory information as the cargo is being tracked and traced. The limitations of RFID, after speaking of all the good things, it is still new technology. RFID, by definition is RF, radio frequency. Radio frequency would be inherently susceptible to interference from conductive materials such as water, metal, aluminum cans. In the future, if you have the tags being put onto Coke cans or canned foods and you put all of them on your trolley going through the checkout point in Park 'N Shop then I think probably you will have 30 to 40 per cent being missed by the reader. It is because of the fact that the matter will generate significant interference. A lot of people are going into research to see how to reduce that situation. That is still technically unresolved. Other things like outdoor use can be affected because of rain. If you are putting RFID readers onto, say, the customs checkpoint without the cover then when the truck actually moves through the reader, if it is in a rainy situation then that may be affected.

Barriers, I will not go through in much detail. Cost is one of the major things because cost, particularly for Hong Kong, people in Hong Kong and manufacturers, is a major thing. Those are some of the examples that are being trialled in the mainland. You can see that some of the containers are being sealed by an e-seal. That would contain information about when a particular seal is being opened and closed and it would have a unique identification number that would allow the track and trace of that container. That is information about using GPS and GIS systems in China, that is actually being used in the Chinese customs office. Certain trucks, when they are transporting certain freight from manufacturing factories in China over the border to Hong Kong, they are being assigned a certain fixed route. If a particular truck deviates from that fixed route then the customs office in China will be alerted. If you see that blue little thing here, this truck, if they are going northbound to this particular customs checkpoint here and it does an interesting right-hand turn here then that truck would be alerted to the Chinese customs office.

For countries like the US they have similar pilots which allow transportation of cargo through Washington state to British Columbia in Canada. So they would track and trace the vehicle as well as putting an electronic seal onto the container.

The conclusion I will go through quickly. The application of RFID will drive up the cost of goods, application of new technology will involve cost. But we need to look at putting up 50 cents, 60 cents or $1 for the tag, how we can save by using that new technology. We must look into how we can find savings in terms of deploying the RFID across the supply chain in terms of manufacturing, transportation, warehouse, distribution and retail.

Finally, as we mentioned, we advocate that RFID tagging should be done at source because that would give the maximum benefit. We need to secure the support of manufacturers otherwise it would not work. In order to benefit Hong Kong I think we need to talk to the customs authority on both sides of the border to adopt common standards. We need to identify and synchronise application standards, how we interchange data with DTTN and other parties. Data communications standards, electronic data and documentation standards, all that would need to be defined. Finally

we need to define cost and benefits for the adopters. We just cannot push new technology to it without telling them the benefits otherwise they will all be turned off. And we need to start now. Thank you.

RFID Development in Hong Kong




Dr. Lawrence Cheung
Principal Consultant
Hong Kong Productivity Council

The HK Advantage

- The World's finest port facilities
- Proximity to "**Factory of the World**"
- World Class Financial & Banking Services
- CEPA

Question

- How could RFID help to maintain our importance in
  - Logistics
  - Manufacturing
  - Financial
  - Services

The Last of the Low Hanging Fruits – for Manufacturers

- Dwindling cost advantage & competition are forcing manufacturers to break out of the narrow confines of OEM production
- Need to move upstream into product design & downstream to branding & logistics
- **Logistics may be the only remaining "low hanging fruits" to reduce cost for manufacturers**

Information Automation

- Cargoes are objects with no brains – movement is dependant on the availability & accuracy of corresponding information
- *Process* automation in the Supply Chain must therefore be accompanied by *Information Automation*, from end to end

Keys to Information Automation

- Application of Electronics, Information & Communications Technologies to facilitate *end-to-end* continuous ***track & trace***
- **Technological Sophistication** of participants on the supply chain plays a pivotal role

Track & Trace

- Manual registration of cargo information is
  - Tedious
  - Error prone &
  - Costly
- Data entry must therefore be done only *once* & be done *right*
- Automatic Identification Techniques essential to minimising human errors in data entry

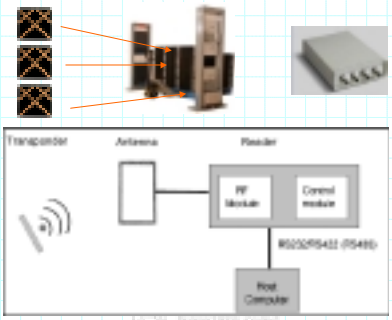
What is RFID?

RFID
(Radio Frequency Identification)

" It is a technology that involves tags that emit radio signals and devices called readers that pick up the signal." EPC Global

What is RFID?

What is RFID?



How could RFID help?

- Unique Identification at all logistics levels:
  - Items
  - Boxes & cartons
  - Pallets
  - Containers
  - Trucks
- Range from 1 cm to 0.5 km
- Line of sight not required
- Non-sequential item registration
- Tolerance to hostile environment

Type of RFID Tags

- Active RFID Tags
  - Long range > 30 metres
  - More expensive > US$20
  - Containers and above
  - Contain more data
- Passive RFID Tags
  - Short range < 5 metres
  - Cost effective < US$1
  - Pallet and below
  - Smaller amount of data

Drivers for RFID

- The drive to use RFID by major overseas chain stores and US Government
- Government Regulatory Requirements - Heightened security measures
- Unification of Standards
- Advances in RFID Technology

EPC – EPCglobal Electronic Product Code

- Adoption and requirement by major players: Walmart, Target, Gillette, Kraft, Procter and Gamble, Metro, Tesco, Kimberly-Clark, Boeing, Airbus
- EPC is much more than just RFID
- Virtual Supply Chain
- Internet of ' Things'

WAL★MART ALWAYS LOW PRICES. Always.

TESCO Every little helps

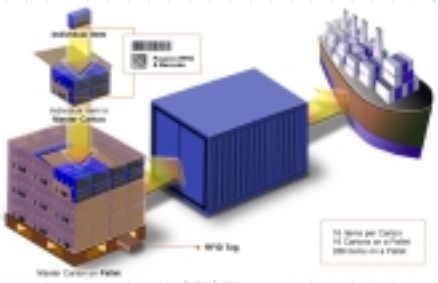
Planned and Existing Use of RFID/EPC in Hong Kong

- Manufacturers
  - Interested but wait and see
  - Sporadic pilot projects with manufacturers
- Logistics Services
  - Airport Authority trials with passenger baggage
  - MTR trial for building materials
  - 3PL services to SME manufacturers

Potential Deployment in Hong Kong Industry

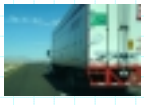
- Hong Kong plays **a pivotal role** for the deployment of RFID across the entire Supply Chain
- For deployment:
  - Manufacturing
  - Logistics and Transport
  - Warehouse and Storage
  - Retails
- To be economically viable, tagging must be applied **AT THE SOURCE**

Potential Deployment in Hong Kong Industry (2)



Use of RFID in Logistics and Transport

- Heavy Land based Mainland – HK container traffic
- RFID tagged carton boxes in each container can be registered
- Highly accurate e-manifest
- Bonded in-land transit -> Possibility of Pre-arrival Clearance
- Reduction in customs clearance time, queuing time at ports



Potential Benefits for Logistics and Transport

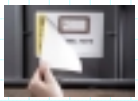
- Automatic Generation of Cargo Manifest
- Significant speeding up of cross border traffic
- Track and trace of smart containers anywhere
- Better information for shippers and buyers -> better inventory control

Limitations of RFID

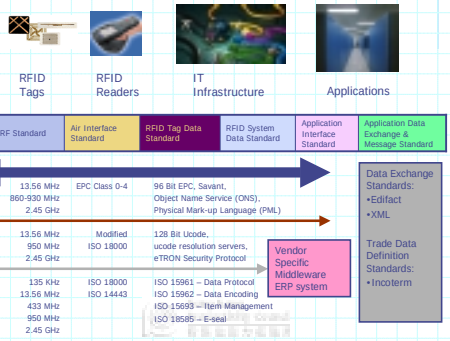
- RF susceptible to conductive materials – water, metal, aluminium cans etc.
- Outdoor use can be affected by weather
- Missed registration not as visible as barcode

Barriers for RFID

- Cost
- Low cost substitute by existing technology
- Lack of awareness
- Lack of urgency
- Concerns about privacy

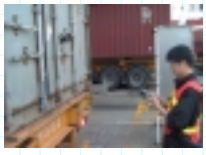


RFID – is fast becoming ready for adoption



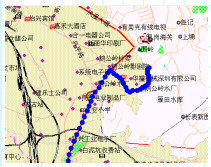
What are other countries doing in this game?

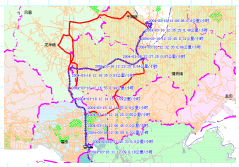
- **The Mainland**
  - SST (Smart and Secure Tradelane) trial at **Yantian** International Container Terminal (YICT) and **Guanlan** Inland Container Depot using RFID and e-seal



What are other countries doing in this game?

- **The Mainland (Con’t)**
  - Global Positioning System (GPS) based container truck tracking system





What are other countries doing in this game?

- **United States** - Northwest International Trade Corridor and FAST (Free and Secure Trade)
  - Automatic vehicle identification
  - Electronic seal sensors
  - Internet-based communications
  - Intermodal freight management system

The Way Forward: (Considerations)

- Application of RFID will push up the cost of goods
- Savings will have to be found to fund the deployment of RFID across the entire supply chain:
  - Manufacturing
  - Transportation
  - Warehousing & Storage
  - Distribution & Retail

The Way Forward: (Considerations)

- To succeed, RFID tagging must be applied **AT SOURCE**
- Need to secure support of manufacturers
- Need to encourage customs authorities on **BOTH** sides of the border to adopt common standards
- Need to identify & synchronize application standards:
  - Data interchange with DTTN & relevant interfacing parties
  - Data communications
  - Electronic Data & Documentation
  - Work practices
- Need to identify cost-benefits for adopters
- **NEED TO START NOW**

Summary

- RFID will have a strong impact on manufacturing, logistics, distribution and retail industries in HK and PRD
- HKPC is ready to support Government's initiatives on the use of RFID in logistics and manufacturers sectors in HK and PRD

DR URE: Thank you, Lawrence. Jonson is going to give us some case study examples. I will invite you to come straight up.

MR YUE: Good afternoon. This is the last session. I hope I will not get you into a tired mood. Just now we have been talking a lot about what is happening in the industry, what are the RFID's standards, what is the future of it. Now let me give you a little bit of background. This is some of the introduction that has been given. This is a sort of track and trace too to help you to get the realtime information, collecting data, right at the field level. These are some of the tags that have been used various projects in the US and Asia. You can see that it comes in all kinds of shapes, in spheres, cylinder, slap and tag, paper, things like that. The physical size of an RFID tag is just a little bit bigger than your ballpen tip. The rest of it is basically the antenna and also the numerical coding, the physical writing of the code on the paper. Here are some examples of readers. You can see it comes in all sorts of shapes. As small as handheld readers and as big as readers for the Autotoll or what they have been using in electronic road places, road toll system. All these are different types of readers that are available in the market and people are using them.

Let me give you a little bit of background on Hewlett Packard. We started on RFID about two years ago. We are one of the pioneers in this area. In HP ourselves, we have over 40,000 products and we have about 110,000 suppliers and partners around the world that we need to manage. So there is a lot of products and logistics in the field. That is why we want to investigate this new technology, how it could help our own operation.

Starting in 2002 we already initiated three major pilots. By April this year, 2004, we already have products on the store front that has RFID tags. So there are a lot of things that have been tested out in the field. In these three factories you can see that in Memphis we are similar to Chester. We are on the box and also the pilot level. Pilot means there is a group of products that you put a tag on. Then on that tag which translates into certain of the components or products within that pallet. Then at the box level, at the regional item level, we are also tagging it. In addition to that, in the Sao Paolo plant we are doing one more thing, which means that we actually go into the component level which means in the production line we actually tag certain components with RFID. To understand the assembly, the production, so that we can make extra visibility in the production as well. To try to test out what would be the extra benefits and also the process that we have driven and how the ROI can help in certain of the cases that we try out later on. In these three projects we actually have tried out different levels of concept. This is the example of a lot of the Memphis pallet pilot. So in the pallet pilot you can see that in the factory level we actually have tried out certain production lines. But things happening and also the test out of the products is actually not easy because a lot of the reader set up and also a lot of the tags depend on the material, if it is a paper box, if it is a piece of metal, for example a chassis of a PC.

So you can see that we have set up a lot of testing so we can try out the best and then after we have set up the pilot we then move on to put it onto the production line to do the testing. You can see this is a set up of a pilot so that we test out how many readers we need, what is the end goal, what is the speed of the conveyor belt, et cetera. If you look at the requirements of the retailers, like Wal-mart, Safeway, Metro, their requirements are quite strict. They need to go in the conveyer belt at very high speed and the reader will still need to pick up 100 per cent of the signal. So there is a very strict requirement that has been set up by the retailer. So we also want to try out

whether it is visible, what is the highest speed that the technology can sustain, what are the different ways of trying it out, things like that. This is in addition to using a conveyer belt, this is using a pallet and forklift truck to help to do the tracking. There are a lot of tricks that we learned from the pilot, for example, around the area what are the readers that are available, what are the products, how about products passing down the side, what would be the interference that is created, how about mobile phones? All kinds of things that could happen and could give you a false signal. So there are a lot of things to try out. It is very important for you to pick certain areas that are most high return and start on some pilot to test it out. This is on the case level. You can see this one is for the printers. For the printer cases we already have RFID that is put into the production line and actually it has been shipped to a few of the US store fronts, to the retail stores.

The process is very simple so at source level we have the tag, very similar to the previous process that you put onto your bar code tag. Actually, a lot of the tags at the moment are still associated with the bar code as a parallel run to play safe so that people could have two systems to track the same product to make sure that it works. This is a close shot on a label on the HP product packaging. You can see there is the EPC identification tag with the EPC tags and also the logo. Also you can see it actually carries the bar code label as well so in addition to using RFID you could actually use bar code to pick up the information as well.

Memphis is actually the same as the previous one, together with Chester. At the case level most of the products, both on the item level we tag it and also on the pilot level when we put together all the products in a group we tag it together so we can satisfy both our internal requirement as well as the future, say, retailer's requirement like Wal-mart. You can see that on the pallet level, after it is shrink wrapped, we put another tag on top of it. Chester is ink cartridges which we tried on a different set of products other than PCs and printers. We actually tried it on supplies on a smaller scale and also with different textures. As you already understand from the previous speakers, RFID it is also a kind of physics, it is radio frequency so it is prone to a lot of other radio frequency or material interaction. So with ink, with liquid, with a fluid-based substance, how would it react? We are actually trying to use our own product to test what would be the areas to avoid those errors and to make it more effective in the process.

Sao Paolo, I gave you a little bit of information before, this is the level that actually on the shop floor, on the assembly line, on the production line, we try to put in RFID into certain major components. It is not every single component that we use into that product but into those that we see as high level components, as the major components. If it goes wrong with any one of that it will create a lot of extra cost in the rest of the assembly process or the production process. That is why we try to tag it and gather the information on the assembly line and fit it into the production control system and see what would be the extra information and value that we could create.

HP, other than at least three projects around the world, we have much more that is happening now. Those are the projects we initiated in 2002. At the beginning of this year we already extended into a worldwide project. As you can see we have a lot of manufacturing areas and contract manufacturers and suppliers around the world. We are trying to create a worldwide kind of project to maximise the benefits and identify the key areas to implement this technology to get the best return for ourselves. From a lot of

the presenters earlier today Asia-Pacific actually is a worldwide manufacturing or OEM kind of manufacturing centre. So a lot of the dots you can see on the map come from the Asia-Pacific. These are the sites that we are planning on different stages, phase two and phase three pilots around the world. Once you get to the start you can gradually project it into your organisation and pick up the process. Basically RFID is a technology tool to help you. Other than technology you have to put in the process and also the people behind it to make it work as a whole. In addition to our internal case we actually are honoured to be helping out on the Wal-mart case. A lot of people have been talking about the Wal-mart case but a lot of them are actually working with the suppliers of Wal-mart. We are honoured to have had the pilot project to actually help Wal-mart throughout these two years on their pilot scheme, their distribution centre plus three of their stores. Actually, in July this year we have finished all the pilots and by August we finished the evaluation report provided to Wal-mart. As you can see, by January 2005 they are mandating the top 100 suppliers to provide their products so that Wal-mart can have the information on pallet level into their distribution centres and also their shop floor. So these are some of the requirements. HP has been invited to help out. If you look at some of the requirements, they are targeting 100 distribution centres and 3,000 stores by the end of 2005. The standard they have chosen is the EPC Global 915 MHz. On this store what they are looking for is trying to get the benefit to help them to plan further into 2006 and 2007. What they are trying to figure out is the benefit from the extra visibility of their supply chain. Actually in the evaluation report it has already given them some surprise. Surprise in terms of the extra benefits in their supply chain. Let me give you one or two examples. Although we cannot give you all of it. One very good example is they found out that in their store, some of the products come into the back storage, and then from there immediately goes out to the shelf which is a normal process but after half an hour it was pushed into the back store again, and then two hours later it was pushed out to the front shelf and then pushed back. Back and forth about four or five times. This is one of the extreme cases. What it says is that some of the products were accidentally replenished and they were ordered from the distribution centre. Someone thinks that the shelf is empty and tries to replenish it but finds out the product is still plentiful on the shelf and needs to push the product back. Which means that there is a lot of misunderstanding on the operation which means their operations are not totally in time, which means they have a lot of things where they could get extra business saving on the supply chain process. This is only one of the examples.

There are lots of these examples that they thought of at the time they start planning for this project. You can see there is a lot of extra benefit they can get. That is why they are so excited that they are trying to keep this mandate deadline of January 2005 to get this done. Other examples, I have seen that a lot of the presenters have gone through some. Procter and Gamble is a good one, also a Wal-mart supplier, Gillette, Marks and Spencer in Europe, they did a very successful pilot, DHL and Nokia, they are working on tags to prevent theft. Phase one is trial and completed, Unilever and Safeway, Benetton is a good example and good lessons for all of us. They have tried out with a very successful pilot but the whole project was cancelled just because they did not communicate it very clearly to their customers. Because of the privacy issue there is a lot of false information around and the general public actually creates a lot of rumour and false message and forced the pilot to stop because of a privacy issue. The consumers thought that Benetton was actually trying to track and trace the kind of living pattern and location of some of the items. Basically, it is not true. Who, buying apparel,

would still have the bar code label on after you have purchased it for a week? Also one other very good example is in the automobile industry. It has been using RFID at least for four or five years. It is because their components are normally a relatively new example. Where do you start? These are some of the examples I am talking about; retail, supply chain, manufacturing, asset management, access management. But what are the learnings we have gone through? Let me share with you a little bit. Firstly, before looking at the technology you really need to look back at your own process. Process improvement, what are the areas that you get the most benefit? Maybe some area you can get RFID and process improvement in the same place.

How to integrate to your application. Just getting the information is no good for you. What is most important is to get the information and work with what you have at the moment and to integrate them to get the valuable information and take action on that. Extra visibility, it will give you extra visibility. It will give you some surprises as well, as most of our pilots have discovered. Be prepared and be optimistic on that.

Error handling, you always need to do a certain amount of error handling. Fortunately a lot of the application has been done for you. Training, of course you need a lot of training, on your process as well as on your technology people and your IT people. The physics, RFID is on radio frequency, so there is a lot of physics, a lot of trial and error, a lot of awareness that you need to put through. So most important as the last one I showed you, do some research, what are the processes, what are the areas? Do a trial and do your business case. Get your business return. We have various offerings in certain areas to help you to identity the areas of interest: what would be applicable to RFID, what would not, what is the possible return, what is the experience in the field, what is the experience of implementing it, how to pilot, how to choose the proof of concept and how to do it together with your team. Thank you very much for your time.

RFID is working now! Real-life cases

Mr Jonson Yue
Senior Marketing Manager
Hewlett-Packard
Oct 04

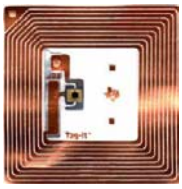
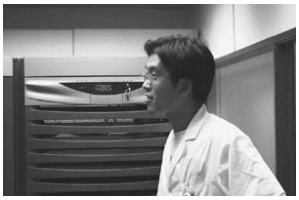
Overview

- RFID (Radio Frequency Identification) tag / label is a tag with digital information that can be electronically read at a distance even when not visible

The Meu-chip is built using a conventional CMOS process.

RFID value proposition

The effect of reducing information latency to near zero, achieving time and location history independence, while decreasing labor, and increasing agility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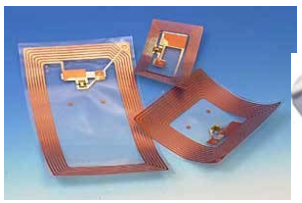
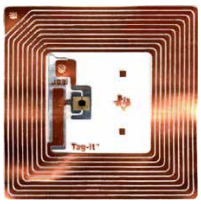
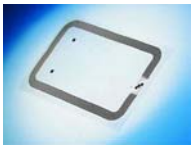
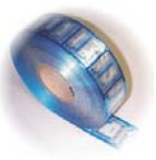
Examples of Tags









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Examples of Readers








RFID @HP

HP is an experienced early adopter of RFID , the early days

- Working to achieve both complete customer compliance leadership and contribute to greater efficiency in HPfs global supply chain
- Early pilot results - container security initiative and RFID proof-of-concept
  - Enhance supply chain security & efficiency while minimizing shipment delays
  - Positively position HP for homeland security driven initiatives
  - Learned early capabilities, potential uses and limitations of RFID
  - Assessed benefits for HP & its customers
  - Small scale proof of concept pilot, RFID technology shown to work in principle
  - Errors, learningfs and information started to build team of RFID expertise within HP
  - Positively positioned HP for internal efficiencies and wal*mart/dod compliance driven initiatives

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HP RFID - Memphis Pallet Pilot

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Memphis - Portal







Memphis Set Up






HP RFID - Memphis Case Pilot

- The Case Pilot Team kicked off during the first week in Aug 2003
- Pallet Team recommended piloting at case level to gain operational efficiencies in the Shipping operation
- We are also working with large HP retailers to synchronize with their pilots

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HP RFID - Chester Plant Pilot

- The Site Pilot Team kicked off during the first week in Aug 2003
- Chester receives inkjet cartridges in bulk and packages them for different markets and customers
- They are starting at pallet and case level outbound and will then
  - walk, back up the process chain to Receiving

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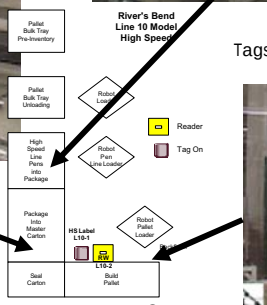
Chester , Ink Jet Cartridges

Future

Tags can be applied at the item level.



Current

Tags attached to cases at the end of the automated assembly line.

Current

Robots automatically stack cases on pallets.
Tag for pallet attached at shrink wrap station.

HP RFID - Sao Paolo Printer Plant

- The Site Pilot Team kicked off during the first week in Sept 2003
- Sao Palo receive components and raw material and perform the full range of manufacturing and completion processes, shipping finished goods to Customer in the Latin America Region
- They are starting at pallet and case level outbound and will then
  - walk, back up the process chain to Receiving

HP worldwide RFID project

Squawk Geographic Scope

RFID impacts businesses, operations and Customers in all Regions. Therefore program scope is global and pan HP in nature

And that•s just for goods delivered into the USA !

Wal*Mart Case Study

Wal*Mart

- Top suppliers live by Jan 2005
- Rest of the World by 2006/7
- HP is a top supplier of Wal*Mart and is working with them
- Easier for HP than many CPG companies
- Items tagged to carton level only
- Perceived benefits include:
  - Reduced theft
  - Reduced cases of out of stock items

Wal*Mart Initiative

- The requirements:
  - RFID tags on Pallets and Cartons Shipped by January, 2005 for the Top 100 suppliers
  - Phased implementation starting in Texas (3 DCs + 150 stores)
  - End of 2005: +100 DCs and 3000 stores
  - Shipments compliant with ePC class 1, 2 (i.e. use 96 bits information pattern, WORM) in the UHF frequency - 915MHz
    → manufacturer, product and serial number
  - Creates broad industry enabling as the Wal*Mart Top 100 suppliers have been asked to present plans by Feb/2004 for how they will fulfill the requirements
  - Investment between 13 and 23m$ (source AMR)
- Issue: Today RFID readers are not SW upgradeable so additional costs when ePC 1.2 will come out ➔ Flexibility is needed

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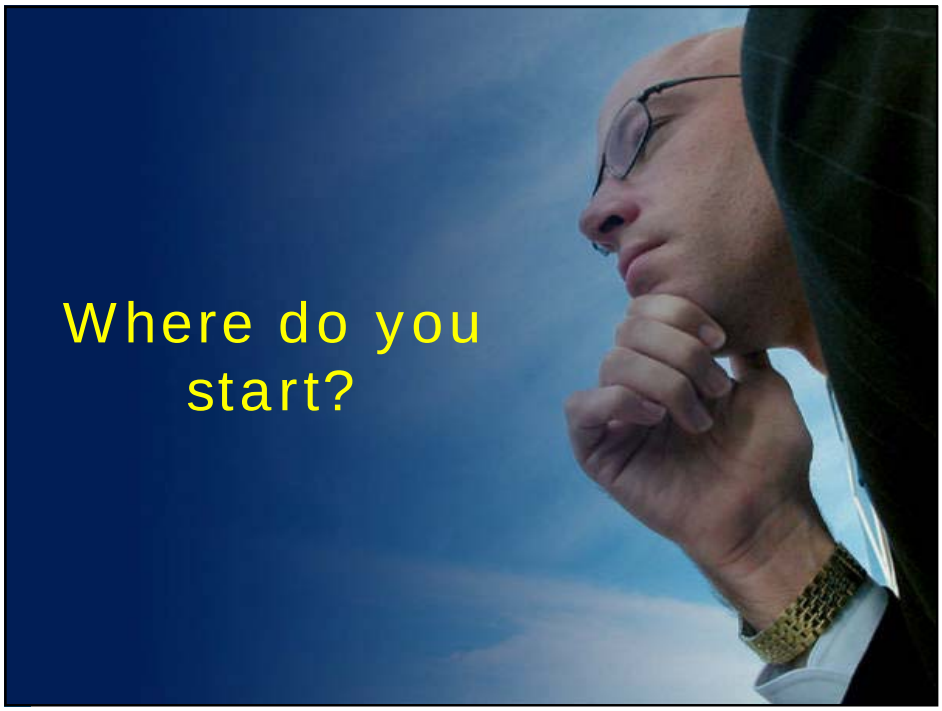
Wal*Mart Pilot

- 1st Shipment May 2004
- 3 Stores (from total 3000)
- 1 Distribution Centre (from total ~100)
- 8 Suppliers, including HP
- 1 month of data collected

- Significant improvements identified in the Supply Chain.

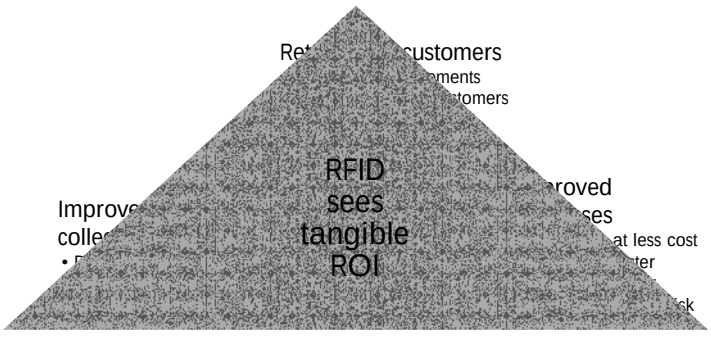


RFID Solution Directions

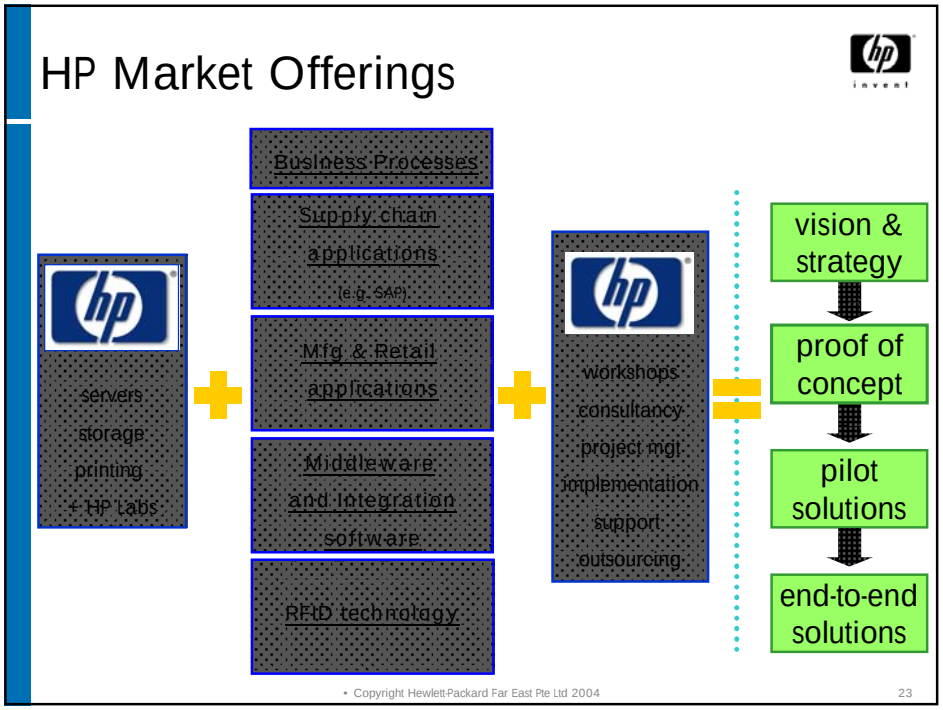
- Supply Chain
- Manufacturing
- CRM
- Asset Management
- Access Management
- Distribution / Logistics Management
- Vehicle Identification / Tracking
- Warehouse Management
- Container seal / tracking
- Box Pallet tracking
- FMCG Tracking / Tracing

RFID Benefits

- Increased visibility into the global supply chain
- Reduced cost and increased velocity
- Revenue protection and increased security



Experience from our HP/s RFID Implementation
Source: Ian Robertson
Global Director , Pan HP RFID Program


HP Market Offerings
Business Processes
Supply chain applications
(e.g. SAP)
Mfg & Retail applications
Middleware and Integration software
RFID technology
servers
storage
printing
+ HP Labs
workshops
consultancy
project mgt
implementation
support
outsourcing
vision & strategy
proof of concept
pilot solutions
end-to-end solutions
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Discussion•
invent

DR URE: Thank you**.** We are pressed for time. We have about five minutes. Just a couple of thoughts that occurred to me listening to those presentations. There was an interesting point that Lawrence brought up about the fact that RFID will actually put up the price. It is a cost. He has suggested that would be outweighed by some of the benefits. As an economist I immediately think, "Where do the costs and benefits fall?" An interesting concept would be what kind of compensation mechanism could be brought into place so that some of the people who are making the benefits share those benefits with some of the companies that have to bear the costs? If there is not that compensation mechanism then the companies that are only faced with costs will not see much benefit for them in playing ball. A thought that occurred to me while listening to Jonson is that some of the experiments and testing that you are doing will come up with some interesting results. Are you going to share those with your competitors?

MR YUE: That is why I wait until IBM is out of this room.

DR URE: Any brief questions for our speakers? We had very full and detailed presentations. They will all be on the TIF website so you can consult them there. So it remains for me to thank Anna, Lawrence and Jonson, John Hammond for chairing the first session, Tom, Peter and Tradelink for sponsorship, Edward who will be on a plane in half an hour and also to thank you Bloomberg for use of this auditorium. Thank you very much indeed and a round of applause for our speakers.