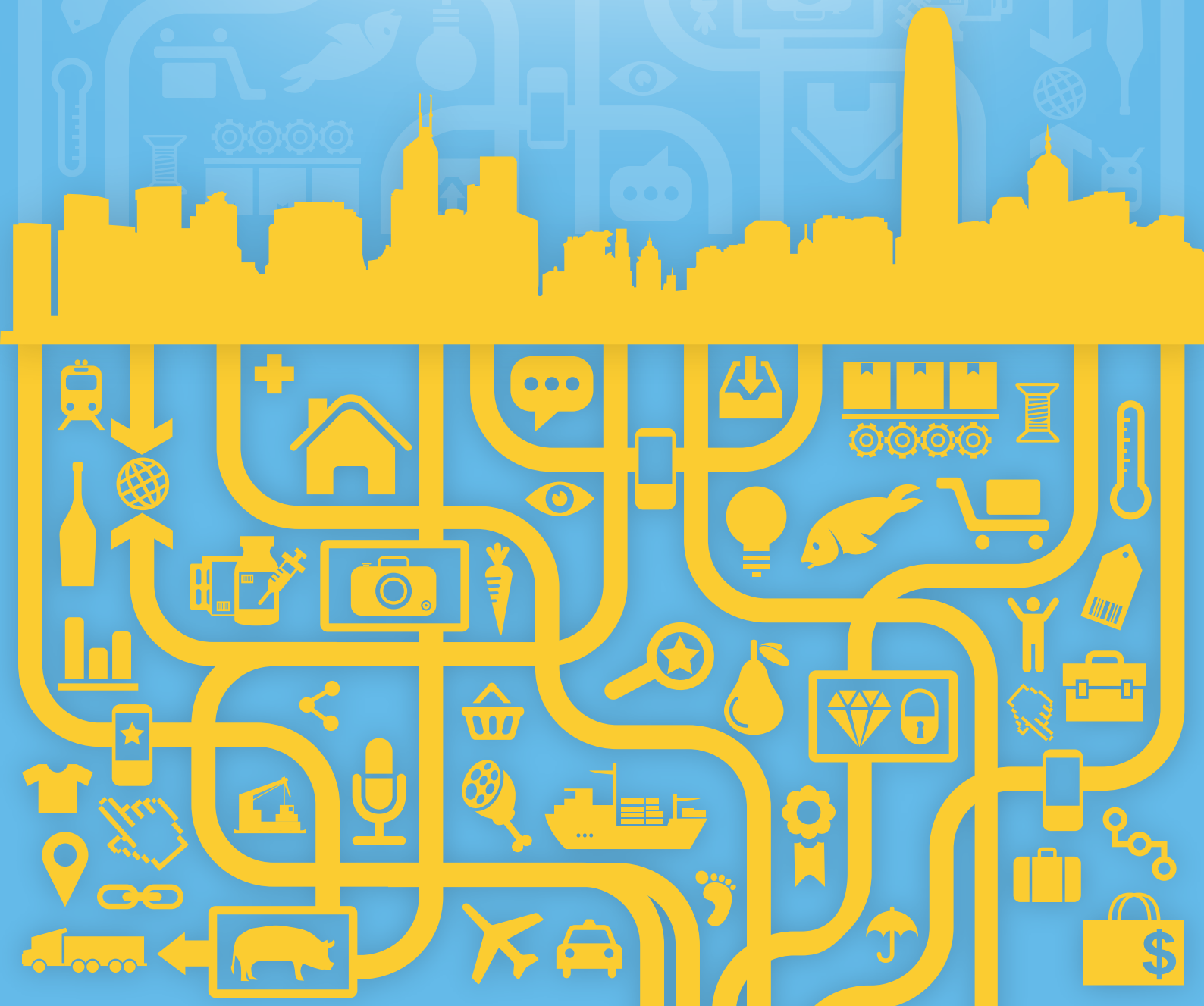
GS1 Hong Kong

HK RFID Awards 2013

香港無線射頻大獎

Leaders in Business Excellence Creation



Hong Kong RFID Awards 2013

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8 November, 2013

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Welcome Message

Information and Communications Technologies (ICT), which drive the development and deployment of epoch-making or significantly improved products or solutions, are key impetus to economic growth and development. According to the World Competitiveness Yearbook 2013, our technological infrastructure is ranked first globally. Our world-class ICT infrastructure provides an ideal environment for all kinds of Internet-enabled devices to connect and interact with each other. As the foremost vehicle that recognizes the creativeness of our local enterprises and individuals in transforming innovative ideas into commercially viable solutions, the Hong Kong RFID Awards helps facilitate Hong Kong to be a leading ICT hub in the region.

As the local chapter of GS1, a non-profit global supply chain organization, we have been working closely with the HKSAR Government, industry and trade associations over the past 25 years to increase Hong Kong's competitiveness and help enterprises effectively communicate with their trading partners through the development of the Electronic Product Code™ (EPC) standards for RFID and Internet technologies, as a business enabler for the global supply chain. We will continue our collaboration with the aforementioned communities to empower the robust ICT development in the region.

Since the Hong Kong RFID awards were initiated in 2008, we have noticed the number of entries growing annually. So far, nearly 200 entries have been submitted by various organizations and students, a remarkable feat for an event that has only been in existence over the last six years. Now on its 6th consecutive year, the Awards mark the creative spirit of Hong Kong enterprises and students by recognizing and honoring the city's most innovative organizations and young talents who have demonstrated excellence in harnessing RFID technology to improve business operations and enhance people's lives.

We are honored to have received the support of the HKSAR Government and industry in organizing the Awards, and the wisdom of leading voices in government and industry in the judging process. On behalf of GS1 Hong Kong, I would like to thank the government, the panel of judges, the participating companies, the business and the academic community for their continuous endeavor to promote the development and adoption of RFID technology.

Last but not least, I would like to extend my warmest congratulations to all Awardees for their exceptional and innovative works, and hope that the Awards will encourage the local business community to continue to harness the power of RFID technology and solutions providers to continue to innovate.

Ms Anna Lin, JP
Chief Executive
GS1 Hong Kong

Congratulatory Message

My heartiest congratulations to GS1 Hong Kong on the continued success of Hong Kong RFID Awards!

Since 2008, the Awards have recognised many Hong Kong companies for their excellence in developing and implementing RFID technology. Through Hong Kong U-21 RFID Awards, the innovative efforts of our students and tertiary education institutes are also acknowledged. The winners of the Awards have demonstrated their ability in creating value for business and life by applying RFID technology in an innovative way. I am very glad to learn that they have even gained recognition from places outside Hong Kong - this year's winners from the business category won four top prizes at the Guangdong-Hong Kong RFID Awards 2013.

With our innovative and energetic people and enterprises, Hong Kong is well positioned to further develop innovation and technology. Through the joint effort of Government, industry, academia and the research sector, we can foster a vibrant innovation culture in our community. The Awards play a pivotal role in this process by promoting awareness about RFID technology, its wide applications and its benefits to our world.

Miss Janet Wong, JP
Commissioner for Innovation and Technology
The Government of the Hong Kong Special Administrative Region

About the Hong Kong RFID Awards and U-21 RFID Awards 2013

The Organizer

GS1 Hong Kong is a not-for-profit industry-led organization established to promote global standards, best practices and enabling technologies in the field of global value and supply chain management. As the local chapter of GS1, we are the only organization in Hong Kong authorized to issue GS1 and Electronic Product Code (EPC) identification numbers.

GS1 Hong Kong

The Objectives

The Hong Kong RFID Awards was first established in 2008. The awards program is created to champion the use of EPC standards compliant RFID technology by enterprises. The principal objectives of Hong Kong RFID Awards are to:

- Bring recognition to pioneering enterprises that have successfully brought EPC/RFID technologies into their business operations.
- Encourage the adoption of EPC/RFID technologies by businesses in Hong Kong and the Pearl River Delta region.
- Foster the development of new EPC/RFID products and services.

The Awards Categories

The Hong Kong RFID Awards has three categories. These are:

Best EPC/RFID Implementation
These honors will be awarded to enterprises that have successfully adopted EPC/RFID technologies in their business operation to deliver business value and proven return on investment through cost savings, operational efficiency gains, improved production and supply chain management, and better customer service.

Most Innovative Use of EPC/RFID
These honors will be awarded to enterprises that have employed a high degree of innovation and creativity in their application of EPC/RFID technologies to solve operational issues and meet business challenges.

Most Innovative EPC/RFID Products
These honors will be awarded to enterprises that have created RFID products which are highly innovative, easy to deploy, cost effective, addresses market needs and complies with global RFID standards, in particular EPC standards.

Cross-border Recognition

GD-HK Awards | RFID

To drive industry adoption of RFID technology and further enhance the co-operation on RFID applications in Hong Kong and Guangdong region, the Hong Kong RFID Awards scheme has been collaborating with Guangdong RFID Awards since 2011. The Guangdong-Hong Kong RFID Awards program is co-organized by GS1 Hong Kong and Guangdong RFID Technology Service Centre. Winners of Hong Kong RFID Awards will be nominated to participate in the Guangdong-Hong Kong RFID Awards.

Hong Kong U-21 RFID Awards

In a bid to uplift the spirits of the Hong Kong RFID Awards, the first-ever Hong Kong RFID Awards U-21 RFID Awards was established in 2009 which is open to both full-time and part-time undergraduate and postgraduate students of any local tertiary institutions.

The Objectives

- Foster collaboration between industry and academia to develop new EPC/RFID applications and technological products with market potential
- Nurture a new generation of technical professionals with creativity and business acumen
- Stimulate market demand for innovative EPC/RFID applications and products
- Inspire new insights in the industry with the innovativeness and enthusiasm of tertiary students

The Hong Kong U-21 Awards Categories

Best EPC/RFID Concept
The winner of this award will demonstrate a high level of originality and creativity in adopting EPC/RFID technologies attempting to address a well-defined business issue or daily lives' problem, which has foreseeable market potentials.

Most Innovative EPC/RFID Application
The winner of this award will be an EPC/RFID application, integration or product, which is innovative, possesses distinctive features, complies with global RFID standards, and may also address market needs. Heavy weights will be allocated for projects developed through partnership between an enterprise and an academic institution.

Cross-border Recognition

Hong Kong - Taiwan EPC/RFID Academia Awards is another cross-border award program established by GS1 Hong Kong and GS1 Taiwan in 2011 with the mission to bring recognition to creative young talents in Hong Kong & Taiwan. The gold winners from Hong Kong U-21 RFID Awards are nominated for Hong Kong-Taiwan EPC/RFID Academia Awards.

The 5th Anniversary of Hong Kong U-21 RFID Awards

Stepping into the 5th consecutive year, the organizer continued to carry out the U-21 Industry Facilitation Program to invite RFID technology experts and pioneers in the industry with distinguished accomplishments in their fields and professionals to be mentors of the student participants. A series of sub-programs was introduced in 2013.

Hong Kong U-21 RFID Award Industry Facilitation Program

Mentorship Programme

Hong Kong U-21 RFID Award Coaching Session

Hong Kong Internet of Things (IoT) Centre of Excellence Visit

HK RFID Awards

GRAND PRIZE
EPC/RFID Mission Tour to Taiwan

To celebrate the 5th anniversary of Hong Kong U-21 RFID Awards, GS1 Hong Kong introduces a **special prize for the gold winners of the Hong Kong U-21 RFID Awards cum winners of the Hong Kong Taiwan EPC / RFID Academia Awards 2013**. A mission tour to Taiwan in November 2013 with academic exchanges and visits to successful implementation of RFID technology will be conducted.

ACHIEVEMENTS

95
Project entries

330
Students participated

50+
Supervisors

30+
Departments of tertiary institutes involved in Hong Kong

2013 Award Activities Snapshots

Hong Kong U-21 RFID Awards Winners sharing seminars in universities

Business winning case sharing in Internet of Things (IoT) Symposium 2013 at Hong Kong Science Park

Hong Kong RFID Awards Assessment

Hong Kong RFID Awards Judging Panel

Hong Kong U-21 RFID Awards Judging Panel

Hong Kong U-21 RFID Awards Assessment

Hong Kong RFID Awards 2013
Messages from the Judging Panel

Mr. Tommy Lui
Panel Chair
Executive Vice President, Supply Chain Solutions
LF Logistics

The sixth Hong Kong RFID Awards were held in 2013 amidst increasing adoption of RFID tagging and technology by large retailers in USA to improve their inventory accuracy at store level and by progressive industry first movers in Hong Kong. The Panel of Judges are genuinely surprised by firstly the overwhelming number of entries for the Award this year, and secondly the quality and creativity of all the finalists who have showcased original, practical and professional applications of RFID technology to Hong Kong and the nearby markets.

Industry practitioners increasingly recognize that the Internet of Things has a very promising future as the smart use of big data has shown unprecedented capability of understanding market needs, improving service user satisfaction and productivity of the operations, and upgrading life style of the individuals. AutoID technology like RFID is essentially an integral source of the big data which Hong Kong has involved in early stage and enjoyed competitive advantage in Asia.

Once again, the Award winners in 2013 have demonstrated the typical entrepreneurship and shrewdness of Hong Kong enterprises in adopting new ideas and technology. On behalf of the Panel of Judges, I would like to congratulate the winners of this well deserved accolade and wish them all the success in capitalizing technological innovation in their businesses.

Ms. Anna Lin, J.P.
Chief Executive
GS1 Hong Kong

As one of the most promising emerging technologies of the 21st century, RFID is being adopted to drive more effective, timely business decisions, and to improve customer interactions leveraging enhanced visibility. The Hong Kong RFID Awards is the foremost vehicle that recognizes the creativeness of our local enterprises and individuals in transforming creative ideas into commercially viable solutions.

The Award winners this year have well-demonstrated the innovative use of EPC/RFID technology and "user-oriented" approach which dovetail our aspiration "Smarter Business, Better Life". With concerted efforts among different parties to drive the wider adoption of RFID technology, I hope the Awards will further help encourage the local business community to push the technology forward, leading us to a smarter and better future.

Mr. Johann Wong
Deputy Commissioner for Innovation and Technology
HKSAR Government

It is my honour to be a member of the judging panel again this year. All the projects were splendid examples of how technology and creative business ideas could be combined with great results. They have not only impressed the judges, but undoubtedly benefited the public as well as the sustainable development of innovation and technology in Hong Kong. May I extend my congratulations to all the well-deserved winners and participants for their effort and passion.

Ir. Dr. Paul Tsui
Chairman
Hongkong Association of Freight Forwarding & Logistics (HAFFA)

On behalf of HAFFA, I wish to extend our heartfelt congratulations to all winners of the Hong Kong RFID Awards 2013. It is my deepest pleasure to be part of these prestigious awards. With the hard work and dedication of GS1 Hong Kong, the Hong Kong RFID Awards has grown in its recognition over the past years and all winners of the awards represent the high quality and integrity of RFID development and adoption in Hong Kong. RFID plays an increasingly important role in helping logistics service providers gain visibility into the global supply chain, increase efficiency by optimizing business processes and automating asset and inventory management. I look forward to seeing innovative thoughts and creative ideas from brilliant talents who will share with us their achievements and inspire us with their success stories in the coming years.

Mr. Stephen Cheng
President
Hong Kong Logistics Association

As a member of the Judging Panel, I was delighted to witness a high standard of the competition. The participants had done a lot of preparation before they came for their presentation. Much could be seen that RFID had its value in business operation when implemented. It can be forecast with confidence that RFID will be implemented as a trend in the near future. The award winners have proved successful in their endeavours in RFID and are worthy of my heartfelt congratulations.

Mr. Simon K.Y. Wong
Chief Executive Officer
Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies

It is my honor to be one of the judges of the Hong Kong RFID Awards again this year. The contestants showed many innovative applications of EPC/RFID technologies into their business operations. They act as the role models demonstrating how EPC/RFID technologies can be applied and added value to their business. The outstanding quality of the projects reinforce the potential development of the EPC/RFID technologies and their applications in Hong Kong. Congratulates once again to all the winners!

Hong Kong RFID Awards 2013
Messages from the Judging Panel

Mr. Allen Ma
Chief Executive Officer
Hong Kong Science and Technology Parks Corporation

RFID technology is widely applied in our daily life today and brings a lot of convenience. Entering its sixth year, Hong Kong Science and Technology Parks Corporation is honoured to continue to co-organise Hong Kong RFID Awards and is extremely impressed with the quality entries we see every year. The entries are both innovative as well as practical, which are the core elements for R&D projects to succeed. I believe creative thinking can be stimulated through the Awards which will further enhance local and overseas technological innovation and implementations.

Hon. Charles Mok
Legislative Councillor (Information Technology)
Legislative Council of HKSAR

I would like to sincerely congratulate all winners of the Hong Kong RFID Awards 2013.

As an advocate for home-grown innovation in Hong Kong, I am delighted to see that this is the sixth consecutive year for which the Hong Kong RFID Awards have been held. The Awards has brought synergy to local development of RFID applications, and continues to create more business opportunities for local enterprises, benefiting our economy and society.

I wish the co-organisers of Hong Kong RFID Awards 2013 the best and look forward to a successful event.

Dr. Gerd Wolfram
Managing Director
METRO SYSTEMS GmbH

It is really impressive to see the innovative spirit and dedication of all the contestants and certainly my special appreciation goes to this year's winners. Congratulation! Being on the Panel of Judges for the Hong Kong RFID Awards for several years now I am again very excited to see so many highly professional cases from so many different sectors. The creativity of the solutions and projects shows that the RFID/EPC technology becomes more and more important in so many sectors. This technology is key for driving efficiencies and for creating added value for any kind of business. I am keen to see what the future holds for the use of EPC/RFID.

Prof. Becky P.Y. Loo
President
The Chartered Institute of Logistics and Transport in Hong Kong (CILTHK)

Technology is changing our lives profoundly. Nowadays, people enjoy enormous benefits and convenience brought by technological advancements. Yet, these technologies need not be the most advanced or sophisticated ones by scientific standards. This year, I was impressed by the "user-centered" approach of many RFID applications. These applications vary from entertainment delivery, factory management, charity donations, to an anti-fraud security system. I want to congratulate the winners for their innovativeness in designing RFID applications with people in mind. The quality of submissions this year was no doubt very high. In the future, I hope that the RFID Awards will continue to encourage excellence in making innovations relevant to the society.

Prof. Waiman Cheung
Director, Center of Cyber Logistics, Asian Institute of Supply Chains & Logistics
The Chinese University of Hong Kong

As a judge of the Hong Kong RFID Awards this year, I am pleased to see most of the participating project teams have presented innovative use of RFID on increasing efficiency and effectiveness of diverse operation processes, as well as bringing values to customers. The winners have no only stretched the boundaries of the RFID technology but also created new RFID enabled business models. I would like to take this opportunity to congratulate the winners on their excellent achievements.

Dr. Andrew Ip
Associate Professor, Department of Industrial and Systems Engineering
The Hong Kong Polytechnic University

It was my pleasure to be invited as one of the judges of the Hong Kong RFID Awards this year. I was impressed by the innovativeness demonstrated from the project applications of the enterprises, and their successful adoptions of EPC/RFID technology into their business were recognized. I would like to congratulate the winners on their innovative EPC/RFID product and service applications, and their contributions in the EPC/RFID development in Hong Kong and China. I wish this well-reputed award program would continue to encourage more adoptions of the EPC/RFID technology into various businesses and industries to enhance competitiveness and enable sustainable development.

Dr. Shing-Chi Cheung
Professor and Associate Department Head of Computer Science and Engineering
Director of RFID Center
The Hong Kong University of Science and Technology

I am honored to be a Judge for the HK RFID Awards 2013, and am impressed by the innovation and accomplishment made by our local industry to advance the RFID technologies and its applications. I appreciate very much GS1's effort to organize this annual event. Winners of the award should be proud of the excellence of their IT teams.

Prof. George Q. Huang
Professor and Head of Department
Department of Industrial and Manufacturing Systems Engineering
The University of Hong Kong

It has been an exciting experience to see so many excellent entries into the competition. Winners have demonstrated their outstanding RFID/EPC innovations and solutions with particular relevance to Hong Kong businesses. This is certainly another step forward towards wider uses of RFID/EPC technologies to improve operational efficiency, bring value to customers and facilitate strategic decisions. Many congratulations to all the participants and winners.

List of Awardees

Best EPC / RFID Implementation

End-To-End Supply Chain RFID Item Level Tagging (ILT) for Fashion Retail Industry
Penta (China) Manufacturing Company Limited, NetAGE Development Limited, QBS System Limited

RFID-embedded Pearl Identification and Certification System
Fukui Shell Nucleus Factory

Real Time Ambulatory Patient Information Deployment Enabler (RAPIDE)
National Cancer Centre Singapore, Hong Kong Communications Co. Ltd

Most Innovative Use of EPC / RFID

RFID-embedded Pearl Identification and Certification System
Fukui Shell Nucleus Factory

End-To-End Supply Chain RFID Item Level Tagging (ILT) for Fashion Retail Industry
Penta (China) Manufacturing Company Limited, NetAGE Development Limited, QBS System Limited

Real Time Ambulatory Patient Information Deployment Enabler (RAPIDE)
National Cancer Centre Singapore, Hong Kong Communications Co. Ltd

Most Innovative EPC / RFID Products

mHand H1-B
Megabyte Limited

CS208 EPC/RFID Intelligent Integrated Reader with Over-The-Air (OTA) Management
Convergence Systems Limited

RFID Shopfloor Traffic Light System
Information Processing Consultants Ltd.

XS Autoclavable UHF RFID Tags for the Healthcare Industry
Xerafy Ltd

Certificate of Merits

Samsung "Virtual Pop-up Store"
Aigens Technology Limited, Cheil Hong Kong Limited

UNICEF NFC Charity Sticker
Aigens Technology Limited, Cheil Hong Kong Limited

RFID Guardian System - for Elderly Home and Long-term Care Facilities
Caritas Harold H.W. Lee Care and Attention Home, RFID System & Supplies Limited, QBS System Limited

RFID Solution of Item Level Tagging on DBHK Retail Store Management
DBHK Trading Co., Ltd., QBS System Limited, U.R. RFID Limited

IoT Food Quality Management Service Platform
DCH Logistics Company Ltd., E-Business Solutions Limited

DR-E/U-USB® UHF RFID Desktop Reader: ACACIA
GTSYS Ltd.

Development of Anti-Counterfeit Identification Microsystem (AIM) by SiP Technology
Hong Kong Applied Science and Technology Research Institute Company Limited

KerrierRFID Record Management System
Kerry Logistics

HOMAC® ML-100GTB RFID Dual Frequency Reader
RF Tech Limited

SecurePro RFID - Life Jacket Management System
SecurePro Group

DPS (Digital Paper Solution) on Limited Edition Artistic Products
tMG Art Store by MITM, T2 Media Solution (HK) Limited

RFID Forklift and End-to-end Warehouse Solutions
William Marsh & Company Limited, PCCW Solutions Limited

WEOPEN
We Did Limited, Inno Team Industrial Company Ltd.

Winning Cases Sharing

Penta (China) Manufacturing Co. Ltd.

NETAGE SOFTWARE DEVELOPMENT

GOLD **Best EPC / RFID Implementation**

SILVER **Most Innovative Use of EPC / RFID**

End-To-End Supply Chain RFID Item Level Tagging (ILT) for Fashion Retail Industry

Background

Penta (China) Manufacturing Co Ltd is a Hong Kong company established in 1988 to engage in the manufacturing, wholesale distribution and retail of leather products - including laptop bags, suitcases, wallets, shoes. Targeting the Guangdong province as its major market, China, the company has 37 self-owned retail shops, along with three franchised stores that are required to follow a uniform set of operational and logistics requirements. The company sees a stock turnover of 500,000 items a year, on the average.

Business Challenges

Despite a huge workforce deployed for stocktaking, Penta (China) attained only a 90% inventory accuracy, which reflected considerable stock shrinkage and loss of sales at retail level. Whether the stock losses were the result of pilfering or an order fulfillment problem, the company was unable to pinpoint the root problems as it could hardly afford the resources required for detailed item-level checking to be done manually at every point of the supply chain process. With the growth and fluctuations in retail demand for its products, yet with its inventory problems unresolved, the company eventually reached an operational bottleneck at warehouse level.

Over the years, audits had been conducted at its stores to ensure right display of the right products on the right shelves. However, it turned out that more than 10 SKUs (stock-keeping units) were missing, leading to sales losses. It was also difficult for the company to find out more about these display management and sales issues, due to the limited information produced from the shop audits.

Security tags were attached to the products for anti-counterfeiting purpose. Yet, owing to unethical business practices at distribution channel level, the company discovered that its leather products were illegally sold in the online market, at unauthorized retail prices. This had affected the Fortune Duck brand image.
Another business challenge stemmed from the company's decision to adopt a franchising business model, to extend the market reach of its products and brand on the mainland. Yet, this has challenged the company to resolve the issues of operational standardization, inventory track and trace and sales strategy, to be eventually adopted by the franchisees.

Solution

With the assistance of its implementation partners, NETAGE Development Limited and QBS System Limited, Penta (China) Manufacturing introduced RFID item-level tagging to enhance its logistics efficiency, preceded by pilot runs involving all its supply-chain partners, including its outsourced manufacturers and distributors, to let them experience the benefits. Their cooperation, particularly in picking the best-performing RFID tags under each product category, was also indispensable for the project's eventual rollout.

RFID tags were attached to different items in their standard packings, to achieve a 100% read rate, within two seconds of scanning. This uplifted their supply chain traceability, from manufacturing to receipt, quality inspection, warehouse check-in, storage, internal transfer, stocktaking and repacking in the warehouses as well as check-ins, inventory count and inspection of display configuration at retail level.

Results

Facilitating a higher level of visibility, this RFID item-level tagging project led to an increase in inventory accuracy from 90% to 99.9% and flawless order fulfillment. In this process, manufacturers with a regular low rate of order fulfillment and the reason for stock shrinkage were identified, enabling remedial measures to be taken. Cartons passing through the RID tunnels were 100 % read within five seconds, at item level, with a 10 fold increase in the speed of product movements and handling. The company has also become capable of identifying distribution channel operators behind the unauthorized online sales of its products. In addition, daily checking of display management at store level takes only minimal effort and the RFID scanning to accomplish the task can be delegated to just a single part-time operator.

Winning Cases Sharing

福井製核所
Fukui Shell Nucleus Factory

GOLD **Most Innovative Use of EPC / RFID**

SILVER **Best EPC/RFID Implementation**

RFID-embedded Pearl Identification and Certification System

Background

Fukui Shell Nucleus Factory is a Hong Kong-based company established in 1990. It specializes in manufacturing and supplying pearl nuclei and pearl farming operation tools to pearl farms around the world. It also designs and creates mother-of-pearl arts and crafts, operates an Akoya pearl farm, and has a local pearl specialty shop. The technology and production techniques that the company uses have their foundation from Japan.

Business Challenges

Traceability and identification have been a major issue within the cultivated pearl industry. Another challenge relates to "counterfeiting," where the seed (pearl nuclei) would be treated with bleaching and whitening agents to give them a better look. However, the resulting pearl would become spotted and low grade. Unethical manufacturers might also use alternative materials that can destroy the pearls upon drilling.

Owing to the non-existence of a traceability system to track the cultivated pearls along the supply chain, it was difficult for the market to differentiate similar-looking pearls and brand pearls, and any attempt to provide individual pearls with traceability was previously limited to the use of non-permanent and adhesive labeling. As the pearls do not come with detailed information, their value is based on their five visible qualities - luster, size, colour, shape and spots.

Even with a pearl certificate presented, it only reveals the current state of the pearl and any similar looking pearl may match the information provided. By comparison, diamonds can be sent for gemological certification, their origins traceable and quality endorsed by independent laboratories since each certified diamond has been engraved with a permanent identification.

Solution

To address these concerns, the company decided to develop RFID technology for pearl identification. The research and development took two stages – 10 years for the new generation pearl nucleus and 2 years for the RFID technology. Each pearl nucleus is embedded with a RFID tag for identification. An ID code is assigned to each pearl. By combining with the database and access to the pearl's ID code will reveal product origin, production date, size, grade, sales destination and other salient data related to the pearl nucleus.

As this identification system applies to cultured pearls, pearl farmers need to provide the commencement date and location of cultivation. The harvest dates of the pearls and their evaluations by professionals are entered into a centralized database. The availability of such information makes it possible for jewelers to brand their pearls and produce quality certificates in a scientific, systematic manner based on factual information.

Results

RFID-embedded pearl nucleus allows identification without physical contact as long as the RFID tag remains intact, minimizing the likelihood of damage. This allows for improved inventory management, coupled with the ability to trace the origin and cultivation of each earl. The tag can also facilitate pearl evaluation beyond the five physical qualities; pearl certification with a unique identification number, and pearl authentication.

Whether it is for tracing the source or checking the cultivation periods, the addition of any accurate and objective information from RFID-enabled pearl nucleus technology, will add to the value of pearls, by a minimum of 30%. In intensely competitive jewellery market, the extra information could be used to educate consumers on the true value of pearls. As a result, pearl authentication can be made authoritative through the certificates issued and such identification can be used to clearly distinguish them in origin, type, quality and other attributes. And with the expected rise in pearl prices, Hong Kong's status as a pearl jewellery trading centre will be augmented.

HK RFID Awards

National Cancer Centre Singapore
SingHealth

IHiS

HKC 香港通訊

BRONZE **Best EPC / RFID Implementation**

BRONZE **Most Innovative Use of EPC / RFID**

Real Time Ambulatory Patient Information Deployment Enabler (RAPIDE)

Background

The National Cancer Centre Singapore (NCCS) is a national and regional centre that offers an one-stop holistic range of clinical services to patients, conducts basic, clinical and translational research and develops public cancer education programmes in cancer treatment and prevention. At NCCS, the Ambulatory Treatment Unit (ATU) is responsible for providing chemotherapy treatment and related procedures, serving an average of 35,000 patients annually.

Business Challenges

Cancer is the No. 1 killer disease in Singapore. Treatment interventions, including chemotherapy and optimal delivery of care, are paramount in influencing patient's chances of survival. Improving resource allocation and service turnaround time would also enable timely treatment and increase in treatment capacity.

However, patient absenteeism – either no shows or late arrivals for scheduled appointments – is the big business challenge to the ATU at NCCS. Failure to attend an appointment on time results in inefficiency because the vacant appointment interval is often not used by another patient, resulting in underutilization of hospital resources.

At the NCCS, the ATU is physically separated into two suites. This architectural factor makes it impossible for the scheduler to tell which bed or chair is vacant, thus, complicates the manual planning of medical resources and patient tracking. Furthermore, patients might develop drug reactions and complications requiring extended treatment time. If the procedure takes longer than expected, subsequent patients were forced to wait, equipment was potentially tied up when needed elsewhere, and nurses' schedules were altered. Doctors and nurses also wasted precious time searching for or going through information about patients for the treatment.

Solution

An RFID-enabled system for medical resources management and patient tracking was implemented by Hong Kong Communications Co., Ltd. During the admission process, the patients would be assigned an active RFID tag and the system would match them with their respectively assigned nurses. Besides patients, nurses and doctors, together with the centre's 46 chairs and 8 beds, are also tagged. RFID readers are installed on the ceiling to decipher the data transmitted to them.

The system could be used to identify the staff overseeing specific rooms and also the doctors in charge of different patients. Due to the tagging of a primary nurse to the patients, the system would also facilitate more flexible resources deployment, allowing hospital staff to take in ad hoc treatment cases.

The patient will be notified by SMS reminder for the treatment once the treatment interval is available. Treatment duration can be extended for 30 minutes or an hour by the nurse pressing a designed button, thus the system will automatically re-schedule the resources for other patients.

The RFID tags carried by the patients will also be used in the discharge and payment process. The active tags are deregistered when dropped by the patients into a box with a reader attached to it. On the whole, the system allows for better monitoring and the use of the treatment cycles for all patients.

Results

Visibility of real-time processes between the treatment unit and the waiting area has been raised significantly. This has resulted in a better resource planning and scheduling system, based on real-time feedback from the data captured.

The system has achieved an 8% reduction in waiting time for treatment. Correspondingly, treatment capacity of ATU has been increased 22%, catering to 4,000 patients annually. Efficient utilization of clinical resources, such as beds and recliners, has also increased by 20%. Overall resource efficiency currently reaches 90%, as opposed to 70% to 80% previously. In addition, 100% traceability of patients and nurses is also achieved.

Winning Cases Sharing

megabyte

Most Innovative EPC / RFID Products

mHand H1-B

Background

Established in 2008, Megabyte Limited develops UHF RFID devices, middleware and software, including RFID readers, handheld devices and antennas. The company specializes in RFID solutions for the retail, fashion, pharmaceuticals and security industries as well as archive management systems.

Business Challenges

Jewelry stores in Hong Kong and mainland China are faced with the daunting need of managing and accounting for vast numbers of expensive product items moving in and out of their vaults every day, during opening and closing hours. Increasingly more of them will replace the existing barcode-based systems with RFID applications to provide full automatic tracking, sales data capturing and assets authentication. In this process, manual inputs will be phased out by automation. The use of RFID solutions will therefore significantly ease the task of managing the distribution, sales and flow of items.

However, traditional RFID handheld devices are primarily designed for logistics and warehouse settings and their use on the store front would not only appear unsightly but also affects the image of glamour and elegance associated with jewelry shops. Furthermore, traditional RFID handheld devices have been designed for a single purpose with no flexibility in usage. Considering this, jewelry shop operators would be required to order different handheld models suited to different working environments and functional purpose, thereby increasing their operating costs. Another limitation of the readers is that they usually remain on standalone O/S, with a lack of Internet of Things and Cloud support creating difficulties in large deployment.

Solution

mHand H1-B is a RFID reader designed for use in different settings and to provide multiple functions, including mobile stocktaking, reading capacity and portability, with various antenna options and ease of connectivity to Internet of Things. Equipped with switchable antenna, LCD torch light and adjustable reading power, its slim, ergonomic design is more compatible with a jewelry store brand image.

The device can be tuned and adjusted for reading distance with a higher level of reading sensitivity. Various antennas have also been designed for different applications. For short-range proximity group reading, the near-field type antenna can be used. But for long-range reading, the far-field circular or linear antenna is available. Its 'Plug and Go' mechanics design also makes for easy antenna switching.

The reader can connect with any Bluetooth enabled devices, OS independent, providing a seamless connectivity with all mobile devices including smartphone, tablet, notebook and laptop. This helps increase the UHF RFID mobility and connectivity over a network.

Results

Given the reader's Bluetooth connectivity and OS independent feature, there is no need for jewelry store operators to invest in system integration or change their system and structure. It is also compatible with all Bluetooth-enabled devices to provide RFID stock-take and data exchange within a mobile platform. Because of these attributes, it is more likely that the device will find easy acceptance by the brand retailers.

The device's antenna design can be tailored to meet the unique specifications of different shops or chain stores, while reducing the workload on changes of operation practice. The device's near-field antenna is designed for reading individual or a small cluster of jewelry items, without covering other tagged products nearby. As for long-range reading and item searches conducted across the display showcase, a far-field antenna is available.

HK RFID Awards

CONVERGENCE SYSTEMS LIMITED

SILVER **Most Innovative EPC / RFID Products**

CS208 EPC/RFID Intelligent Integrated Reader with Over-The-Air (OTA) Management

Background

Convergence Systems Limited (CSL) is a design engineering and sales company providing RFID readers, antennas, RFID modules, and custom RFID tags. These products are designed for OEMs and system integrators in logistic management, supply chain, manufacturing, pharmaceutical, access control, asset and security management, transportation and retail industries around the world. CSL was incorporated in 2000, with its own engineering and management teams at its Hong Kong headquarters and China manufacturing operations.

Business Challenges

Enterprises have turned to RFID solutions to better track and inventory their static resources, from raw materials to finished goods, as well as mobile targets including people, livestock and fleets of moving vehicles. The ability of RFID to capture data without a line of sight may represent a huge improvement over barcode systems, but still, deployment options remain limited. This is because some readers have a short read range and low read rate. Others are unable to perform in dynamic setting and capture moving data, particularly in harsh conditions that involve oil, high temperatures, chemicals and hazardous substances.

Besides the challenges of remote data collection, EPC RFID tag monitoring in all-weather and difficult terrain environments may turn out to be problematic. Under such circumstances, extensive work is required in getting all the system components integrated and fully tested within a reasonable time. It may also be difficult to perform on-site maintenance and software upgrades. Moreover, only limited space and power are available for deploying RFID equipment on mobile platforms such as mass transit vehicles, school buses, trucks and forklifts. Putting all the necessary hardware system components in place may also deter companies with its high cost.

Furthermore, an effective communication link between a remotely located EPC/RFID reader and a backend server may not be readily available in all settings.

Solution

Convergence Systems Limited (CSL) sought to resolve these issues by designing an EPC/RFID integrated reader with over-the-air capabilities. Sporting a rugged, all-weather design, the reader is EPC compliant and offers a high-speed data capture ability, suited for mobile platforms. The fully-integrated "plug and play' EPC/RFID reader is configurable and controllable through an intuitive "over-the-air" interface. Its built-in middleware also means that the device can be customized for specific RID tasks and operations.

Results

The reader was designed for use in a variety of environment including warehouse, personnel tracking, parking lot gate, automated vehicle identifications, livestock farm, tracking on mobile platforms or any location where asset visibility is essential. It achieves read distances of up to 62ft through metal and 56ft through cardboard.

Reportedly, using the reader can help the user saves over 50% of the total cost of purchase and installation of various functional subsystems. Another advantage it brings is the low infrastructure cost for data collection, coupled with the low development cost for customized software programming. The remotely-located reader requires only low maintenance and routine technical support.

Winning Cases Sharing

INFORMATION PROCESSING CONSULTANTS LTD 資訊系統顧問有限公司

BRONZE **Most Innovative EPC / RFID Products**

RFID Shopfloor Traffic Light System

Background

Founded in 1983, Information Processing Consultants is a Hong Kong company that provides technology and software solutions. One of its endeavors, in the recent years, is looking into ways to facilitate the garment manufacturing process through the active deployment of RFID products.

Business Challenges

Most garment factories have been using a paper-based system to record tasks and events in relation to the production process. Due to this, production issues are not brought to management attention early enough for immediate remedial action to be taken. Given the lack of real-time monitoring of their individual work performances, factory-line workers have not been offered immediate assistance by their supervisors when difficulties arise. In many cases, both workers and their supervisors are not even aware of the production anomalies, so much so that these problems become repeated over and over again, contributing to production waste. Another noteworthy issue is workers' non-productive time (NPT), due to machine breakdown, sudden unavailability of raw material, the lack of relevant skills and other factors.

The information lag in garment production lines described above, has inhibited the efforts of supervisors and managers in maintaining assembly line efficiency, product quality and product status. In reality, the problems are revealed only when the reports are aggregated, and it is then too late for rectifications to be made.

Solution

IPC developed a RFID traffic light system at shop-floor level capable of capturing critical real-time production data in garment manufacturing. Under this system, a RFID ticket is attached to a garment piece at the cutting table. Installed at each work station, normally with a sewing machine operated by a worker, is a real-time RFID data terminal, complete with four LED signal lights in red, yellow, green and blue. Red indicates a severe mistake has occurred; yellow indicates a minor mistake; blue denotes a call for supervisor attention and is counted as NPT; green is a signal indicating everything goes as planned.

Workers are required to swipe the RFID tickets after completing each piece of work and the data is sent immediately to the Manufacturing Execution System (MES). Inline QC inspectors are equipped with an IQpad to capture inline quality issues. When quality issues arise, the inline QC inspector invokes a signal light to notify supervisors who must attend to the issues immediately. These supervisors are also equipped with RFID staff cards, which can be swiped to transmit a report in real time to the MES.

This RFID-enabled traffic light system on the garment production sites therefore sends all kinds of critical data – including QC information, line efficiencies, worker efficiencies and production status – for display on Kanbans, which are signboards to facilitate just-in-time (JIT) production. The data is made accessible to factory management in real time to make swift decisions.

Results

All garment factory employees are familiar with the traffic light system and its role in quality control. This RFID solution, developed by IPC based on EM4100 technology standard, makes the operation of the traffic light system much more efficient than its manually operated equivalent. Since the EM4100 technology is well matured, the cost of the data capture devices and RFID cards has been made more affordable. Coupled with wireless technology, such as WiFi as well as 3G/4G data carriers, managers can monitor every operational aspect of their production plants more closely.

This RFID solution can help reduce wastages including working time and materials wastage in work in progress as any mistakes can be identified, alerted and remedied instantly, leading to overall improvements in quality control and operational efficiency at work floor level.

HK RFID Awards

XERAFY™

BRONZE **Most Innovative EPC / RFID Products**

XS Autoclave UHF RFID Tags for the Healthcare Industry

Background

Xerafy Ltd was established in 2010 with its headquarters office in Hong Kong to provide RFID solutions for customers to track assets in a wide range of harsh environments. More specifically, the company provides read-on-metal tags that can be embedded directly into assets to meet a full range of needs for RFID asset tracking in the aerospace, industrial, data center, healthcare, energy and other industries. These solutions have been used for different applications, such as tool tracking, surgical instrument management, remote asset management, IT management and MRO (Maintenance, Repair and Overhaul) management.

Business Challenges

Managing surgical instruments is a critical function that directly affects the core missions of medical organizations: providing excellent patient care. However, hospitals face constant challenges to ensure that the correct instruments are available when and where they are needed.

Inaccurate tracking of surgical tools creates inventory problems that not only cost hospitals thousands of dollars annually, but more importantly, can make a difference between life and death, when a particular item fails. Errors in identifying surgical tools and following specific cleaning and sterilization processes increase the risk of hospital-acquired infections (HAIs), a growing problem that is attracting increased attention from healthcare organizations and regulators. The FDA has created the Reusable Medical Devices Improvement Initiative to address these problems, and cited accurate product identification as a key to preventing HAIs. More and more, hospitals and sterilization centres find it essential to improve item-level traceability in order to realize the benefits of cost reduction, increase productivity and patient safety.

As customers look to RFID technology to address these concerns, the key challenges that confront them include finding RFID tags small enough as well as capable of providing a reasonable read range of around one metre as well as withstanding harsh autoclave and chemical cycles, since the surgical trays and instruments are regularly subject to sterile processing. Also, these autoclave tags need to surmount the challenge of ensuring acceptable attachment methods and be in compliance with stringent standards and regulations of the healthcare industry.

Solution

Xerafy developed a series of tiny tags with a read range of up to 1.5 m. Their low profile and ability to be mounted on metals and embedded in metal allow surgical equipment to be RFID-enabled at the point of manufacture. Specially designed for the Sterilization Processing Department and Operating Department in hospitals, these tags are complaint with US FDA and biocompatibility requirements for medical devices and capable of surviving repeated autoclave sterilization cycles. In addition to surgical instrument tracking, the autoclave UHF RFID tags can also be used for medical implant device tracking and sterilization management.

Results

Characterized by a small size with an ability to withstand sterilization and be embedded in metal, autoclave UHF RFID tags make it possible for all functions related to surgical instruments in a hospital setting, from the operating room to cleaning and storage, to be tracked through a single system. From a supply chain perspective, they allow optimal logistics and storage of surgical instruments and smooth the workflow at CSSD (Central Sterile Supply Department) and to the surgical theatres. Fulfilling the latest FDA requirements for the unique identification of medical and surgical instruments, they can help uplift the level of patient safety at the healthcare organizations where they are used.

Certificate of Merits

Aigens Cheil

Samsung "Virtual Pop-up Store"

Omni-channel retailing, which connects the web, mobile and brick-and-mortar channels into a seamless customer experience, is increasingly embraced by retailers to differentiate their brands in the competitive marketplace.

A recent example is a "Virtually Popup Store" jointly developed by Aigens Technology and Cheil Hong Kong, to provide interactivity for customers at selected Samsung retail stores in the city. Users could retrieve interactive contents such as high-definition movies or a full music album just by tapping their smartphones against the RFID-enabled posters displayed. Drawing on high-speed transfer technology, large files such as video will start playing on the phones within a few seconds. This initiative is designed to offer customers a unique cross-channel experience and strengthen their brand loyalty. Encouraging them to download multimedia content also generates a publicity boost for the file-sharing feature of smartphone models marketed.

With the "Popup Store"gaining recognition for its potential to become a new advertising channel, its developers are fine-tuning the technology, with plans to market it to the media industry.

Aigens Cheil

UNICEF NFC Charity Sticker

Every Saturday, volunteers can be seen standing on the streets of Hong Kong to raise funds for the charities they represent. However, the authorities have restricted the activity to only five hours from 7 am to 12.30 pm noon. After donating money, passersby receive a tiny "flag" bearing the beneficiary's name and logo to stick on their clothing. Facing difficulties in acquiring volunteers and reaching out to donators, UNICEF has adopted a RFID solution provided by Aigens and Cheil to overcome them.

Since the beginning of 2013, UNICEF has replaced their standard stickers with NFC (Near Field Communication) tags. Volunteers who wear the NFC stickers could ask their friends to donate simply by tapping their smartphones to the stickers. When scanned with a smartphone, these stickers will direct users to the charity's homepage and make an online donation. The idea is to convert every donor into a volunteer. The use of NFC tags allows further donations from the friends and family members of the sticker's wearer beyond Saturday and outside the designated fund collection time.

The campaign has resulted in a 30-fold increase in the number of volunteers recruited by UNICEF Hong Kong and each sticker sold raised an additional six donations.

HK RFID Awards

RFID Guardian System - for Elderly Home and Long-term Care Facilities

Caritas Harold H. W. Lee Care and Attention Home turned to a RFID tracking system to monitor the wandering behavior of its elderly residents, particularly those with Alzheimer's and dementia problems, to prevent them from leaving the home-care facility unescorted. The RFID Guardian System project was implemented in collaboration with RFID System & Supplies Limited and QBS System Limited to achieve this purpose.

Tiny chip-based RFID tags were sewn into the garment of residents so they can keep track of those who are moving and in which directions. Washable and heat resistant, the tags can communicate with the facility's infrastructure, including RFID sensors installed at the doorways. If any resident was detected wandering outdoors, the system would automatically notify the caregivers at once with alarm alerts, accompanied with a real-time display of the resident's identity, whereabouts and photograph on a monitor screen.

Despite its limited staff resources, the elderly home can now keep an attentive eye on its residents and provide them with better protection, while still being mindful of their need for independence, privacy and dignity. Caritas plans to integrate the RFID tracking technology with its existing eCare system to generate reports on residents' health, in correlation to their wandering behavior. The technology will eventually be applied to assets tracking and management as well.

RFID Solution of Item Level Tagging on DBHK Retail Store Management

DBHK Trading Co., Ltd partnered with U.R. RFID Limited and QBS System Ltd to develop RFID item-level tagging solutions for its multi-brand apparel retail chain operation in China. To commence the project, a feasibility study, combined with a workflow analysis, was conducted to determine users' requirements. Trials and demonstrations were conducted to ensure the system designed was viable. Hardware like high-performance tags were selected and tested and software development followed.

One of the significant improvements made was the adoption of RFID handheld readers, rather than traditional barcode scanning, to read item-level tags for merchandize delivery and checkouts. With the implementation of RFID solutions, DBHK is capable of faster and more efficient stocktaking. The operational challenges previously encountered, including wrong shipment, inventory loss, slow data transfer, confusions in product check-in/check-out and excessively tight repackaging schedules, have been largely addressed.

At warehouse level, stocktaking time is now reduced by 70% and repacking time by 30%, with up to 99% increase in stock accuracy. At retail store level, real-time inventory updates can be achieved, with stocktaking time reduced by 90% and stock accuracy elevated up to 99%. 30% of manpower use has been eliminated due to automation. Logistically, delivery time has been reduced 80%, accompanied by a 100% accuracy of products check in-and-out.

Certificate of Merits

IoT Food Quality Management Service Platform

Cold chain is the supply and distribution of commodities, notably perishable foodstuff, medicinal products and other related items, which must be kept within a predefined temperature and humidity range throughout shipping, storage and management of the entire process. If temperature-sensitive items are exposed to unwanted deviations in temperature and humidity levels, irreversible product damage would occur, resulting in spoilage and putting consumer safety at risk.

Recognizing this, DCH Logistics Company Ltd decided to launch an IoT Food Quality Management Service Platform, which developed by E-Business Solutions Limited, to upgrade its cold chain management at warehouse level. The project moved beyond traditional temperature and humidity control, to provide critical real-time data to identify intermittent or gradual lapses in environmental control. Sensors and other devices were put in place to monitor the warehouse environment round the clock. Notification alerts were also automatically issued whenever temperature and humidity fluctuations were detected. The data captured were included in the cold chain audit logs for the reference of warehouse managers.

RFID-enabled cold chain monitoring offered the company better control of its operational parameters, an improved ability for early detection of environmental risks as well as the opportunity to take timely remedial action to avert wastage. In this way, food quality and freshness are guaranteed.

DR-E/U-USB® UHF RFID Desktop Reader: ACACIA

The use of UHF RFID systems for full traceability of products has seen tremendous growth in global supply chains. UHF tags, however, are subject to multipath interference. The presence of metal, for example, could interfere in the transmission of electromagnetic signals. This has made a number of UHF RFID desktop readers unable to operate optimally. The incorrect placement of the readers can also compromise their performance.

GTSYS Ltd, a Hong Kong provider of RFID technology and software development services, has developed an UHF RFID Desktop Reader with modified features to address these concerns. Equipped with a special ceramic antenna, the reader is programmed with two protocol commands and uses a high-speed digital signal processor. The device can identify UHF tags in the read range, even within the vicinity of metal objects or when it has been covered by a hand. The device is powered by a standard USB port and therefore requires relatively little energy to operate.

Development of Anti-Counterfeit Identification Microsystem (AIM) by SiP Technology

Counterfeiting is a global epidemic causing an enormous loss to legitimate businesses and endangering the health and safety of consumers. To crack down on fake products, RFID technology has been harnessed to provide effective solutions.

The Anti-Counterfeit Identification Microsystem (AIM) by SiP Technology has been developed for this purpose by the Hong Kong Applied Science and Technology Research Institute (ASTRI). As opposed to the traditional RFID readers, which are large and unwieldy, this innovation allows an ordinary smartphone to be transformed into a portable RFID reader with the insertion of a tiny SIM card. This means that consumers can authenticate products they plan to purchase anytime and anywhere, just by scanning the RFID tags with a mobile device. The information retrieved from the tag will be sent to a centralized database for product authentication.

Currently, the market lacks a ready supply of RFID reader solutions tailored to smartphones, so the commercial launch of AIM will offer consumers a convenient technology platform for product authentication. Furthermore, this patented project can facilitate product traceability from manufacturing plant to retail store, with the aim of identifying problematic distribution channels in the process.

KerrierRFID Record Management System

Kerry Logistics was using barcode technology to facilitate the storage and tracking of physical documents such as deeds, insurance policies, legal documents and other archived material, as part of the record management services offered to its customers. As its business grew, the volume of documents it handled reached 260,000 cartons, with more than 10,000 customer orders received every month.

An internal project team was tasked to look into how the operational bottlenecks, including the slow and inefficient processes of carton handover, stocktaking and retrieval of misplaced boxes, could be tackled. Based on the findings, a RFID enabled system was designed. RFID equipment ranging from fixed readers with antennae to handheld devices, RFID printer and printing software were procured. The hardware was then integrated with the company's record management system which, in turn, was fine-tuned to suit the RFID-enabled operation flow.

Now with the RFID-enabled record management system in place, piece-meal scanning and counting of 200 cartons and 100 folders take only five minutes. Only ten minutes are needed to stock-take these items and locate a misplaced carton.

Certificate of Merits

RF Tech Limited

HOMAC® ML-100GTB RFID Dual Frequency Reader

Under the existing patrol system, police officers and security guards are required to sign log books and record the time when they arrive at the designated checkpoints over regular intervals. But the accuracy of manual logging can be compromised by human error. Moreover, the log books are susceptible to loss, damage and unauthorized tampering. To address these uncertainties, RF Tech Limited, a provider of integrated RFID services, developed a small, portable dual frequency patrol-tour reader with Bluetooth connectivity that security guards can carry along and use at every checkpoint.

Designed with a waterproof casing, it has an internal buzzer, LED indicators, a single button for simple operation and built-in lithium battery. The reader supports low frequency RFID tags of 125KHz/134KHz commonly used in wall-embedded guard patrol applications. Besides its low frequency tag read/write capability, the device also supports the ISO 14443 Type A Mifare and ISO 15693 card technology, compatible with the identification cards commonly used by patrol guards.

At the patrol checkpoints, the device can read visual and auditory signals and with the Bluetooth connectivity in place, high-speed data collection and transmission to the host system in real time is possible.

安寶集團 SECURE PRO

SecurePro RFID - Life Jacket Management System

Ship operators are required by law to ensure the timely availability of life jackets for passengers and crew, but this can be a challenge when the inventories of these items are poorly organized. Safety regulations also dictate that the life vests must be audited, ensured to be in serviceable conditions and placed in the right locations, prior to the vessel's departure.

SecurePro Group developed an automated life jacket management system to help vessel operators meet these safety and compliance requirements. Comprising hardware and software based on RFID technology, it incorporates RFID tags, which can be fitted into all the life jackets on board, and handheld readers for crew members to track, count and locate the items. The readers cover a designated read range, in which they help reduce the auditing time and find missing life jackets, in just a matter of minutes, and eliminate inventory count inaccuracy due to human error. If the items are incorrectly placed, the crew will be alerted by the light signals aglow on their reader devices.

Looking ahead, the company plans to extend the operational concept to cover firefighting equipment in building management, first aid supplies on ambulances as well as requisite equipment on police vehicles.

DPS (Digital Paper Solution) on Limited Edition Artistic Products

Art collectors may be deterred from acquiring paintings and illustrations that are exorbitantly priced or excessively large. Reproductions could offer a cheaper alternative, but one could never be certain whether the images were from the authentic artworks.

To overcome these hurdles, tMG Art Store created a DPS (Digital Paper Solution) on Limited Edition Artistic Products based on the EPCglobal Gen 2 Standard, in collaboration with T2 Media Solution (HK) Limited. RFID antennas are pre-printed on normal paper with a proprietary technique applied to hold the EPC Gen 2 compliant chips. The solution allows customization in paper size, die-cut, antenna shape and color design, to meet different user needs. The original artwork is scanned with a RFID reader before its images are printed on paper. Because both the antennae and chips cannot be removed without damaging the paper, DPS therefore offers an anti-counterfeiting feature to ensure authenticity of the artwork reproduced.

Upon purchase of an artwork, customers will be issued with a receipt and by scanning it using a smartphone app that connects them to a direct mobile communications platform, where they could view the authenticated results immediately.

RFID Forklift and End-to-end Warehouse Solutions

PCCW Solutions was appointed to develop a RFID warehouse management system for William Marsh & Company Limited, a supply chain firm serving the construction sector. The latter decided to build its own warehouse in Hangzhou, with product inspection and testing facilities, given the lack of quality assurance from its contracted manufacturers.

Recognizing the importance of having real-time inventory information to support the client's management, control, monitoring and forecast functions, the right hardware was first identified and sourced, including RFID-enabled pallets, handheld devices, forklift readers and gateway readers. Several RFID systems, such as a tag registration system, an item-mapping system, forklift warehouse system and gateway system for location-transfer monitoring, were also implemented. Through RFID-enabled forklifts and mobile handheld solutions, the warehouse staff can now pick the right items, efficiently and promptly, from the right locations. RFID technology also makes it possible for the automatic detection of each tagged item passing through the automated gateway, which increases track-and-trace capabilities and visibility.

With the RFID-enabled storage and inventory management solution developed for ceramic-tile products, William Marsh & Company's warehouse is equipped with the means to automatically and effectively pick good-quality items for shipment. The result was a streamlining of warehouse management, enabling William Marsh & Company to enhance operational efficiency and effectiveness.

Certificate of Merits

匯進塑膠電子有限公司
Inno Team Industrial Company Limited

WEOPEN

WeOpen was developed by We Did Limited, a provider of engineering and RFID solutions, to help senior citizens, children, tourists and the disabled find their way around unfamiliar places, safely and without hassles.

This RFID device, which is small and compact and can be worn like a visitor badge, is embedded with a RF UHF 868 MHz transceiver for data reception and transmission. It contains pertinent information about the wearers, including their identities, handicaps and access authorizations for different parts of a building. It can also help control and track the whereabouts and movements of certain individuals, such as Alzheimer's patients, to prevent them from leaving a building without an escort. In addition, the device is capable of identifying RFID location tags installed in places of interest, such as a museum, to provide certain categories of visitors, such as tourists, blind people and the elderly, with the information they need for guidance.

Hong Kong U-21 RFID Awards 2013
Messages from the Judging Panel

Ir. Paul Wu
Panel Chair
Senior Manager, Special Systems
Airport Authority Hong Kong

I am really impressed with the power of imagination and the great effort demonstrated by the students in presenting such good quality Projects for the U-21 RFID Awards this year!

It was a big challenge for the Panel Judges in selecting the winners of the Awards as all of the proposed Projects were very innovative and most importantly they compose the essential elements of IoT (Internet of Things) and beneficial to our daily lives.

I also wish to thank for the invaluable comments given by the Panel Judges to the students which could help them in the practical application of the RFID technology of the proposed Projects in future. Lastly, congratulations to all the winners and their support teams for an excellent job done!

Mr. Stephen Ho
Chairman
Communications Association of Hong Kong

I am delighted and honoured to have been one of the judges of the Hong Kong U-21 RFID Awards this year. I would like to send my decent congratulation to all the winners and the successful conclusion of the "Hong Kong U-21 RFID Awards Program 2013" by GS1 Hong Kong.

I would also like to give a round of applause to all participants as they have shown tremendous dedication and passion toward the development of innovative RFID applications. I am especially excited toward our contestants' high quality, innovative development of solutions that are relevant to the needs of end users and the way how RFID can be incorporated into business applications.

I am most gratified toward the efforts of GS1 Hong Kong in staging such an inspiring and successful annual signature event.

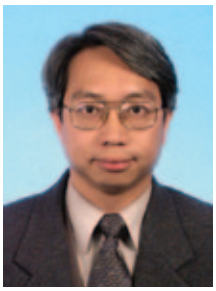
Mr. Terence S.S. CHAN
Assistant Commissioner (Infrastructure and Quality Services),
Innovation and Technology Commission, HKSAR Government

I am delighted and encouraged by the innovative ideas of our participants as they have vividly demonstrated the boundless potential of applying RFID to improving the quality of our life and the efficiency of our society.

They also enhanced our confidence in the ability of our young talents to sustain the development of Hong Kong into an innovation and technology hub.

I would like to thank all participants and congratulate all winners. I also encourage them to continue working on their projects to bring benefits to the community.

Hong Kong U-21 RFID Awards 2013
Messages from the Judging Panel



Mr. Jason Pun
Chief Systems Manager
Office of the Government Chief Information Officer, HKSAR Government

I am pleased to be a judge for the Hong Kong U-21 RFID Awards 2013. I am also glad to see the innovative project ideas and the enthusiasm of the youth talents. I would like to extend my congratulations to the awards winners and applaud all the participants for their creative ideas and achievements in technological innovation.

Ir. Stephen K. M. Lau, J.P.
Vice President (Executive)
Hong Kong Computer Society

I am honored to be a Judge for the HK U-21 RFID Awards 2013 and am impressed throughout the entire judging process with the quality, knowledge and enthusiasm of the participating students from our tertiary education sector.

Not only does this Award encourage the overall and effective adoption of RFID technology and international standards in our community, it also provides a platform upon which our enlightened students in demonstrating their creativity, innovative application of IT and teamwork. I congratulate GS1 Hong Kong for this forward looking Award scheme and all the participating entries.

Mr. Yeap Soon Kuan
Manager, Costuming Distribution
Hong Kong Disneyland

Congratulations to all winners and participants. I am excited to see the many innovative project ideas produced by our young talents. Their projects not only demonstrate impressive creativity, but also display attention to enhancing the customer experience, as well as safety and efficiency. It was encouraging to see their wide range of innovative ideas when applying RFID technology to solve challenges in diversified businesses, with many of them carrying viable business values supported by extensive field studies.

Dr. P.M. Lai
Chairman
Hong Kong Retail Technology Industry Association (RTIA)

Thanks to the dedicated efforts of GS1 Hong Kong for hosting the U-21 RFID Awards 2013. This meaningful event has offered a unique opportunity for our tertiary students to demonstrate innovation and creativity in harnessing the use of EPC/RFID technology. I am honored to be a Judge for this Awards and feel impressed with the enthusiasm of our young talents to come up with many innovative ideas. Congratulations again to all winners and participants. I look forward to their continued efforts and successful implementation of the innovation.

Ir. Peter Yeung
Head, IT & Telecom Cluster Business Development & Technology Support
Hong Kong Science And Technology Parks Corporation

I am honored to be the judge of the HK U-21 RFID Award 2013. Congratulation to all the winners. I am impressed with your projects; they are thoroughly planned and demonstrated a high level of innovation.

Dr. Ken Fong
Chairman, Hong Kong Wireless Development Center
Honorary Chairman, Hong Kong Wireless Technology Industry Association

Congratulation to all the winners for the U-21 RFID Awards. I am honoured to participate in the judging process and am really impressed by the quality and innovativeness of the winning projects from those Hong Kong Students. I look forward to seeing their further development and successful implementation of the projects.

Hong Kong U-21 RFID Awards 2013
Messages from the Judging Panel

Mr. K. K. Suen
Chief Architect and Principal Consultant
GS1 Hong Kong

Our panel judges find it very difficult to select the 'cream of the crop' among this year's excellent candidates. All the entries we received reflect the tremendous effort our young talents are dedicated to optimizing businesses, streamlining operations, raising the bar of patient's safety and improving life quality via innovative use of EPC/RFID technology. I would like to extend my congratulations to all the Awards winners. I wish this Awards continues to nurture more creative young talents which will in turn enhance the competitiveness of the City.

Mr. Ken Chung
Vice President
The Chamber of Hong Kong Logistics Industry

I am honoured to be a Judge for the U-21 RFID Awards 2013. I and my panel judges are deeply impressed by their quality, innovative solutions and enthusiasm of the participating students.

I found that most of the projects are not just only focusing on the uniqueness of technology but also considering the actual application to the daily life. I do hope that those innovative solutions can be applied in the market soon and further enhanced the daily life of community.

I would like to express my heartfelt thanks to GS1 Hong Kong for organizing such meaningful event. I congratulate GS1 Hong Kong for the success in hosting the HK RFID U-21 Awards.

Mr. Stephen Ng
President
The Institute of Purchasing & Supply of Hong Kong

I am happy to be one of the judges for the U-21 Awards 2013 and impressed by students' teamwork in demonstrating their creativity, innovative and knowledge to apply the RFID technology. My congratulation to GSI HK in hosting the RFID U-21 Awards and made it a total success in Hong Kong.

List of Awardees

Best EPC / RFID Concept

SmartBeauty

Students Kwong Wing Yi, Lee Hoi Lam, Leung Hiu Kwan, Yeung Po Ling
Supervisor Mr. Leung Kwok Way William

Associate in Business, Hong Kong Community College

SafeArrival: An RFID-based School Bus Monitoring System for Cross-Boundary Students

Students Chen Yao Xing, Wu Wei
Supervisors Dr. Jacky Ting, Dr. Albert Tsang

Department of Industrial and Systems Engineering & Department of Applied Social Sciences, The Hong Kong Polytechnic University

Development of an RFID-based Surgery

Students Cheung Chun Pong, Tam Hiu Man, Wong Yau Ting
Supervisors Dr. Jacky Ting, Dr. Albert Tsang

Department of Industrial and Systems Engineering,The Hong Kong Polytechnic University

Commercial Building Automation

Students Choi Yau Leung, Lee Siu Kit
Supervisor Mr. Woo Hok Luen

Department of Information and Communications Technology, Hong Kong Institute of Vocational Education (Tuen Mun)

Danger Zones Identification and Alert System - The Application of RFID in Construction Safety

Students Chan Chi Him, Choy Chun Yin, Kwok Chin Hei, Yan Kin Lok, Yau Ho Kiu Kenneth
Supervisor Dr. Lu Wei Sheng, Wilson

Department of Real Estate and Construction, The University of Hong Kong

Most Innovative EPC / RFID Application

RFIShoe - RFID and Bluetooth-Based Intelligent Shoes

Students Liu Xi, Sun Ruo Qing, Zhu Jia Chen
Supervisor Dr. Henry Chan

Department of Computing, The Hong Kong Polytechnic University

Design and Development of NFC-based Mobile Application for Anti-counterfeiting in Designer Bag Manufacturer

Students Chung Chun Lan, Kwong Kuk Hung, Lau Wing Yu, Wu Wing Sum
Supervisors Dr. Ip Wai Hung Andrew, Dr. Lee K.M. Carman, Dr. Ho T.S. George

Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University

NFSee

Students Chiu King Keung, Chung Man Kit, Huang Jie, Li Hoi Yi
Supervisors Dr. Ip Wai Hung Andrew, Dr. C.H. Wu Jack, Dr. K.K. Tseng *(School of Computer Science & Technology, Harbin Institute of Technology Shenzhen Graduate School)*

Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University

RFID-based Location Tracking System - Using a Peer-to-Peer Network Architecture

Student Hui Chun Pan
Supervisor Dr. Henry Chan

Department of Computing, The Hong Kong Polytechnic University

List of Awardees

Certificate of Merits

Food Safety Management System Using RFID

Student: Chan Johnny Chung Yau
Supervisor: Dr. Tsoi Yau Chat Desmond

Division of Applied Science and Technology
Community College of City University

Medical Services Network (MSN) System

Student: Chan Ho Chun, Chan Ho Yee, Chan Long Man, Ho Wing Sze
Supervisors: Mr. Chan Pui Yuk, Dr. Lee Choi Hung

Division of Business
Community College of City University

Beauty Spider

Students: Chau Chi Kit, Cheng Cheong Kit, Ho Put Lo, Hung Yuk Ching, Wong Hei Tung
Supervisor: Mr. Leung Kwok Way William

Associate in Business, Hong Kong Community College

GPRF

Students: Chung Ho Shuen, Lam Wai Wing, Liu Ho Man
Supervisor: Mr. Leung Kwok Way William

Associate in Business, Hong Kong Community College

E.A.S.Y.

Students: Cheung Wai Yi, Chow Tsz Wing, Yu Hin Shing
Supervisor: Mr. Leung Kwok Way William

Associate in Business, Hong Kong Community College

Mall Hunter

Students: Kong Wai Pong, Lau Siu Yan, Lau Ying Yee, Leung Pak Sum
Supervisor: Mr. Leung Kwok Way William

Associate in Business, Hong Kong Community College

Automatic Fast Food System

Students: Ho Tsz Kit, Huen Kai Chi, Ip Tsz Tung Tammy, Tang Ho Fung, Tsoi Hon Kit
Supervisors: Dr. Fong Lai Ying, Dr. Leung Ho Wing, Ms. Man Ka Mun

Department of Applied Science, Hong Kong Institute of Vocational Education (Chai Wan)

Tackling Food Safety Problems of Cakes Shop by RFID Application

Student: Wan Cheuk Chun
Supervisor: Mr. Chan Tsz Chung

Department of Applied Science, Hong Kong Institute of Vocational Education (Chai Wan)

One Shop Sport Centre

Students: Chan Kwok Yan, Chan Ming Hon, Choi Ka Wing, Leung Lam Hing, Mok Ling Fong
Supervisor: Mr. Yiu Cheuk Man Alvin

Department of Business Administration
Hong Kong Institute of Vocational Education (Kwai Chung)

RFID Smart Traffic Control System

Students: Cheng Ho Yin, Ho King Hei Keith, Kwan Shing Fung, Kwong Chun Hing, Lau Tai Yung, Wong Yuen Yat
Supervisor: Mr. Yiu Cheuk Man Alvin

Department of Business Administration
Hong Kong Institute of Vocational Education (Kwai Chung)

Inventory Management System

Students: Chan King Hei, Lee Ka Chun, Tse Pan Tung
Supervisor: Mr. Woo Hok Luen

Department of Information and Communications Technology, Hong Kong Institute of Vocational Education (Tuen Mun)

RFID e-ticket

Students: Chung Chun Ming, Kwok Ka Hei, Wong Chun Sun, Yeung Chin Hang, Yuen Ka Lok
Supervisor: Mr. Woo Hok Luen

Department of Information and Communications Technology, Hong Kong Institute of Vocational Education (Tuen Mun)

RFID with Dogs

Students: Chan Shun Tak, Lun King Fung, Wong Chin Fung
Supervisor: Mr. Woo Hok Luen

Department of Information and Communications Technology, Hong Kong Institute of Vocational Education (Tuen Mun)

Mobile-based Fashion Design Production House Management System by Using RFID Technology

Students: Fong Chung Hin, Lam Ting Yuen, Tsang Yeuk Sing, Yeung Ka Kit
Supervisor: Mr. Kwong Ng Fung Johnny

Department of Information and Communications Technology, Hong Kong Institute of Vocational Education (Tsing Yi)

One Phone To All

Student: Chan Hoi Yung, Chung Ho Yin Jimmy, Lam Tsz Lung, Ma Kam Yin
Supervisor: Prof. Cheng Chun Hung

Department of Systems Engineering & Engineering Management,
The Chinese University of Hong Kong

RFID / Voice-based Warehouse Management System

Students: Shi Zhong Qi, Wang Da, Wang Xiao
Supervisor: Dr. Henry Chan

Department of Computing, The Hong Kong Polytechnic University

An Integrated Energy-saving System with RFID & Cloud Computing

Student: Chen Yao Xing
Supervisors: Dr. Jacky Ting, Dr. Albert Tsang

Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University

U-21 Winning Cases Sharing

Best EPC / RFID Concept

Associate in Business, Hong Kong Community College

Students
Kwong Wing Yi, Lee Hoi Lam, Leung Hiu Kwan, Yeung Po Ling

Supervisor
Mr. Leung Kwok Way William

SmartBeauty

Many shoppers have had the experience of purchasing cosmetics like lipsticks, eye-shadows, blushers or even foundations only to discover they bought the wrong colour. At some retail stores, testers are not made available to customers. As a result, consumers may end up purchasing makeup products that are unsuitable to their complexion types.

SmartBeauty, an app with several features, has been developed by a student team from Hong Kong Polytechnic University to make cosmetics shopping a more convenient, informative and time saving experience. It can also help to ensure shoppers that they will never go wrong with the colours again. Cosmetics items are embedded with passive RFID tags and customers only need to scan them using a smartphone with a NFC (Near Field Communications) feature to call up salient product information and add their favourite products to "Beep & Buy," for example. Once confirmed, the list can be transmitted by smartphone to make actual purchases by shoppers holding their NFC phones near the designated readers in the store.

The "My Stylist" provides a simulation of how shoppers look wearing various make-ups, to help them decide which product is the most suitable for them. Photos taken of the shoppers in different virtual make-ups under "Beauty Book" will be categorised by occasions such as "graduation dinner", "wedding party" or "job interview." This will enable shoppers to make informed purchase decisions. "My-Dressing-Table" provides a list of cosmetic items that the shoppers already possesses, complete with item names, purchase dates and expiry dates, while "Beep Jetso" offers discounts, gifts and other shopping incentives to reinforce their brand or product loyalty.

Best EPC / RFID Concept

Department of Industrial and Systems Engineering & Department of Applied Social Sciences, The Hong Kong Polytechnic University

Students
Chen Yao Xing, Wu Wei

Supervisor
Dr. Jacky Ting, Dr. Albert Tsang

SafeArrival: An RFID-based School Bus Monitoring System for Cross-Boundary Students

Currently, there are over 17,000 students residing in Shenzhen who cross the border daily to attend school in Hong Kong. Meanwhile, this figure has been on a continual increase. For these students, cross-border school buses offer a mainstream commuting option between the two regions. Despite this, their parents are constantly worried because it takes these students around 3 hours to go back and forth every day and parents might not be immediately notified of their children's situation in case of contingencies. Often, they are unsure of whether their children have reached school safely.

Utilizing RFID technology, the SafeArrival system has been developed by students of The Hong Kong Polytechnic University to monitor safety of cross-border pupils and send messages to their parents to inform them instantly their children's travel status. Students' personal details are collected and uploaded to the central system in which the stored data, including student names, school names, pick-up and drop-off stations, is updated regularly. The children are required to wear RFID tags bearing their identification numbers. Each school bus is also equipped with a portable SafeArrival Kit that operates on a Global Positioning System (GPS), Radio Frequency Identification (RFID) system and General packet radio Service (GPRS). The Safe Arrival Kit monitors the real-time location of each school bus, reads students' tags remotely and sends data to the central system regarding the students' embarkation and alighting time and locations. In turn, the system will notify parents when their children get off and on the bus at Customs, arrive in school and when they can be picked up again, all on a real-time basis. With such precise monitoring information provided to parents automatically, their concern over the travel safety of cross-border students from home to school and back can be relieved.

U-21 Winning Cases Sharing

Best EPC / RFID Concept

Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University

Students
Cheung Chun Pong, Tam Hiu Man, Wong Yau Ting

Supervisors
Dr. Jacky Ting, Dr. Albert Tsang

Development of an RFID-based Surgery

Appalling medical errors, including leaving surgical equipment inside the patient's body, are dogging hospitals in Hong Kong and elsewhere around the world. Known in the medical community as retained foreign bodies (RFB), these forgotten objects include needles, tools, and sponges. Another error involves surgical procedures performed on the wrong patient or body part.

These costly mistakes not only result in financial burdens for both the hospitals and affected patients, but the sufferings, loss of health and even deaths that ensue can never be fully compensated. These mistakes can be attributed to a variety of factors, like due to lack of or insufficient training among some of the medical professionals involved, long working hours of medical staff and workplace stress they face.

A Hong Kong Polytechnic University team has developed a system to improve patient safety and reduce complex and time-consuming counting procedures that are prone to human error. The system uses Radio Frequency Identification (RFID) to improve surgery workflow, patient identification, patient tracking and help minimize the likelihood of surgical teams leaving equipment and materials in patients during operations. By reading the RFID embedded wristbands worn by patients, RFID readers installed at the entrance of surgery room can detect anyone entering and verify patient's identity. Hospital staff can also track the movements and current locations of patients entering or leaving areas with reader-mounted access. RFID tags are implanted inside the surgical equipment and related material and placed on a tray embedded with a reader. After surgery, the surgery equipment and material are placed back on the tray where they are automatically counted by the reader, complete with status buttons of colours that alert hospital staff about any discrepancies detected.

Best EPC / RFID Concept

Department of Information and Communications Technology, Hong Kong Institute of Vocational Education (Tuen Mun)

Students
Choi Yau Leung, Lee Siu Kit

Supervisor
Mr. Woo Hok Luen

Commercial Building Automation

Technology is increasingly used to transform office properties into smart buildings not only providing end users with a pleasant and comfortable working environment, but also making the building more energy-efficient. In many office buildings, lighting and air-conditioning are turned on and off at predefined times, regardless of whether there is anyone around. Then there is also the issue of elevator management which in many cases, employees have to wait a long time for the elevators to take them to different storeies, including the restricted areas.

A RFID-enabled system has been developed by a group of Hong Kong Institute of Vocational Education (Tuen Mun) students to address these challenges. When employees arrive to work early, the RFID staff cards they carry will be read by readers, which will alert the system to turn on the lighting and air-conditioning. This ensures that the necessary facilities are always ready for employees, no matter how early they arrive or how late they depart. Based on the number of employees who happen to be around in an office, the air-conditioning and lighting can also be adjusted accordingly. Conversely, when an employee is the last to leave the premises, the lights and air-conditioning will be automatically turned off to save energy. When taking the elevator, employees can use their RFID-enabled staff cards to prompt the system about where they need to go. Ideal for multi-tenant locations, the system also facilitates access control. On the one hand, it limits the access of ordinary employees to the floors they operate in. On the other hand, it offers greater flexibility for authorized personnel, such as senior management executives, to access a more extensive and diverse area within the building.

HK RFID Awards

Best EPC / RFID Concept

Department of Real Estate and Construction, The University of Hong Kong

Students
Chan Chi Him, Choy Chun Yin, Kwok Chin Hei, Yan Kin Lok, Yau Ho Kiu Kenneth

Supervisor
Dr. Lu Wei Sheng, Wilson

Danger Zones Identification and Alert System

Construction sites are challenging environments to manage with workers' health and safety constantly at stake. According to the Labour Department's statistics in Hong Kong, there were 3610 accidents in 2012. The accident rate per 1,000 construction workers was 44.3. This is significantly higher than the average of 21.3 for other occupations. Occupational accident rates are always higher in the construction sector, primarily because of the lack of safety awareness among workers; inadequate monitoring of materials storage and hazards from machinery and equipment. Due to the open environment and dynamic events at all times in construction sites, safety management could not be easily carried out.

Using RFID tags embedded in the "safety shoes" worn by construction workers, a project team in The University of Hong Kong sought to track and record their access through various onsite areas. With these tags in place to identify the workers, the management could arrange those with certain required skill sets to enter designated construction zones. When unauthorized personnel try to access these areas, site managers would be automatically alerted for follow-up investigation. Besides access control, the tags allowed site managers to track the location of each worker and gather them easily when accidents occur. As the tags are also embedded with thermal sensors, alerts will be sent to construction personnel working outdoors when the hot-weather temperature reaches a certain level, so they could take a rest to avoid heat strokes. The shoes they wear are also fitted with RFID-enabled vibrators, which can alert workers in times of emergency. If any workers pass out or fall, the pressure sensor implanted on their shoes would alert the site managers in real time for rescue action.

U-21 Winning Cases Sharing

GOLD **Most Innovative EPC/ RFID Application**

The Hong Kong Polytechnic University 香港理工大學

Department of Computing, The Hong Kong Polytechnic University

Students
Liu Xi, Sun Ruo Qing, Zhu Jia Chen

Supervisor
Dr. Henry Chan

RFIShoe - RFID and Bluetooth-based Intelligent Shoes

People with upper limb disabilities cannot use the computer mouse and are therefore deprived of online access. To help them overcome this handicap, an RFIShoe application has been developed by a group of students of The Hong Kong Polytechnic University to provide "foot mouse" functions through a pair of special shoes.

Carrying a RFID tag, a disabled user wearing the customized shoes can set up the mouse and load their personal profiles to the computer automatically. Wherever they go, they can load the same customized setting on different computers. Sensors embedded in the shoes can collect pressure data, through which different foot gestures can be detected so that the computer cursor can be controlled easily. In the default setting, the left shoe is primarily designed for clicking while the right shoe, for moving the mouse in four directions. Hence, without the need for hands, users can move the cursor up just by stepping the top of their right shoe sole. They can also do likewise to move the cursor in other directions. To change their personal settings, they only need to have their preferences added to the RFID tag, including the tasks to be performed by each shoe and the settings of pressure levels. As the shoes draw on RFID technology to complete auto login, their wearers need not input anything by hand. They only need to move closer to a reader for auto login. Furthermore, Bluetooth technology application enables foot pressure data uploaded to a file, where it can be read, analyzed and converted into cursor behaviors. Practical and user-friendly, the RFID-assisted shoes can help eliminate the digital divide for those who have lost the ability for upper limb usage.

Acknowledgment: The RFIShoe application was developed based on a special shoe system, called Intelligent Footwear System provided by the Institute of Textiles and Clothing, The Hong Kong Polytechnic University.

GOLD **Most Innovative EPC/ RFID Application**

The Hong Kong Polytechnic University 香港理工大學
Department of Industrial and Systems Engineering 工業及系統工程學系

Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University

Students
Chung Chun Lan, Kwong Kuk Hung, Lau Wing Yu, Wu Wing Sum

Supervisors
Dr. Ip W. H. Andrew,
Dr. Lee K.M. Carman,
Dr. Ho T.S. George

Design and Development of NFC-based Mobile Application for Anti-counterfeiting in Designer Bag Manufacturer

Counterfeiting activities are continually on the rise around the world affecting various industries, including the luxury goods business, with a detrimental impact on their revenues, profitability and brand image. One pertinent issue in the fight against counterfeiting is how to enable consumers to better identify genuine products in the retail channels, in ways that the counterfeiters cannot easily copy.

A group of students from The Hong Kong Polytechnic University has designed and developed an innovative mobile application, named "Check It Yourself" to help consumers authenticate designer bag products. Employing NFC (Near Field Communications) technology, cloud computing, EPC network, mobile technology and anti-counterfeit technology, this smartphone app can help to combat the counterfeit activities and raise the cost-to-break for counterfeiters. With this NFC-based mobile application, consumers can use their NFC-enabled smartphones to tap the passive RFID tags attached on the products and to undertake product authentication before purchasing. Successful scanning will ensure that product data retrieved from the tag is sent to the authentication server. Customers can immediately see the product's photo and name displayed on the smartphone screen and the actual item will be declared as a fake if it fails to match the information provided. This simple, user friendly and effective mobile app can immediately help the consumers to check whether the product is genuine or counterfeit, and learn the product information, e-Pedigree and product security features. The mobile app can protect consumers' interests and brand reputation, and the industry can then establish a more positive image to the public.

HK RFID Awards

SILVER

Most Innovative EPC/ RFID Application

The Hong Kong Polytechnic University 香港理工大學
Department of Industrial and Systems Engineering 工業及系統工程學系

Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University

Students
Chiu King Keung, Chung Man Kit, Huang Jie, Li Hoi Yi

Supervisors
Dr. Ip Wai Hung Andrew, Dr. C.H. Wu Jack, Dr. K.K. Tseng *(School of Computer Science & Technology, Harbin Institute of Technology Shenzhen Graduate School)*

NFSee

In the jewellery business, the quality of shopping experience will have a huge impact on the customer's buying decisions. Before buying, many shoppers tend to check out the jewellery items they fancy in retail, sometimes repeatedly. Yet, in many traditional jewellery shops, the items are removed from display after opening hours. Shop space constraints and security considerations also discourage shop operators from displaying their full product range. To motivate their customers in making actual purchases, jewellery shops can consider enriching their shopper experience through 3D visualization, combined with RFID technology.

NFSee, developed by a project team from The Hong Kong Polytechnic University, is an mobile application that jewellery buyers can use on their smartphones to gain a new shopping experience. After downloading the app, all they need to do is placing their smartphones near the Near Field Communication (NFC) tags in the stores. The smartphone will start reading and identifying the tag. Just a scan will offer them access to the video links of the products. Once scanning is completed, a product video from the product database will start playing on their smartphones. Alternatively, customers can touch the product's NFC tag with a smartphone to download a product image. They could subsequently place a small, portable pyramid-shaped "viewer" on the mobile screen. A vertical 3D image will appear inside the viewer instantly for them to appreciate the product in greater detail. Without requiring shoppers to put on 3D glasses, the NFSee solution provides 3D visualization of the products they fancy, to offer them a unique, sensory shopping experience and build their brand loyalty. In addition, store security concerns will not be compromised with this new shopping method.

BRONZE

Most Innovative EPC/ RFID Application

The Hong Kong Polytechnic University 香港理工大學

Department of Computing, The Hong Kong Polytechnic University

Student
Hui Chun Pan

Supervisor
Dr. Henry Chan

RFID-based Location Tracking System Using a Peer-to-Peer Network Architecture

RFID-assisted location tracking has been put to a variety of commercial applications. One of them is assets management system, where RFID tags are attached to objects to track their movement from place to place and prevent unauthorized action in the process. RFID tags can also be embedded with temperature and humidity sensors to provide environmental information as well as product tracking in cold chain management. Apart from indoor crowd control for exhibitions and other events, RFID technology has been applied to elderly care in old-age homes to monitor the movements of residents with cognitive problems. However, RFID-based location systems are often limited by their need for wire connection or a Wi-fi readied environment.

Developed by a student of The Hong Kong Polytechnic University, this RFID-based location adopts a peer-to-peer (P2P) network architecture. This P2P network allows active RFID readers to communicate and transfer data effectively, hence simplifying the installation effort. Fewer reference tags are needed for calibrating and even so, no complex calibration such as fingerprinting is involved. These tags communicate with RFID readers using a wireless link protocol. The P2P network can be expanded easily as it allows each reader to be placed flexibly on an ad hoc basis. These RFID readers can work collaboratively over the P2P network to estimate an object's location. As this system allows implementation time to be shortened providing a low-cost solution for location tracking accuracy, there is plenty of potential for its application in commercial operations.

Acknowledgment: This project is supported by the Innovation and Technology Fund (http://www.itf.gov.hk) and Hong Kong RFID.

Acknowledgements

Co-organizers

Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies
香港物流及供應鏈管理應用技術研發中心

Hong Kong 香港科技園
Science & Technology Parks

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