GS1 Hong Kong

HK RFID Awards 2011 香港無線射頻識別大獎

LEADERS IN BUSINESS EXCELLENCE CREATION

Hong Kong RFID Awards 2011

Presentation Ceremony at GS1 Hong Kong Supply Chain Management Excellence Summit
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Table of Contents

Welcome Message P.2

Congratulatory Message P.3

About the Hong Kong RFID Awards and Hong Kong U-21 RFID Awards P.4 - P.5

Retrospect of Awards Journey P.6 - P.7

Hong Kong RFID Awards 2011

Message from the Judging Panel P.8 - P.9

List of Awardees P.10

Winning Case Sharing P.11 - P.20

Hong Kong U-21 RFID Awards 2011

Message from the Judging Panel P.21 - P.22

List of Awardees P.23 - P.24

Wining Case Sharing P.25 - P.27

Acknowledgement P.28

Welcome Message

Innovation and Technology was recognized as one of the six pillar industries of Hong Kong in 2009. For our community as a whole, the innovative use of technology is essential to ensure a sustainable future; for individual companies, it is vital for growth and a profitable future.

At GS1 Hong Kong, our goal has been to assist enterprises of Hong Kong to enhance their competitiveness through the innovative use of global standards, enabling technologies and best practices. To encourage Hong Kong companies and professionals to harness the power of RFID technology to drive efficiency of supply chains and yield maximum benefits, we introduced the Hong Kong RFID Awards in 2008. The awards honor the extraordinary performance of innovative enterprises and individuals using RFID technology to improve their businesses and to create a better quality of life for everyone.

We are delighted the Hong Kong RFID Awards Scheme has been so well received by both industry and academia. Over 100 entries have received awards since the launch of the program. The winning companies and their RFID-based solutions have no doubt become role models for other enterprises. These successful cases demonstrate — through real-world applications — how RFID technology can create sustainable value for businesses and have also helped to accelerate the development and adoption of RFID technology in Hong Kong.

This year, the Hong Kong RFID Awards scheme began a collaboration with the Guangdong RFID Awards, jointly organized by GS1 Hong Kong and the Guangdong RFID Public Service Centre. As the first ever Guangdong-Hong Kong RFID Awards, the program helps drive the adoption of RFID technology in Hong Kong and Pearl River Delta region and enhances cross-border interchange and co-operation on RFID application and technology development.

The resounding success of the Hong Kong RFID Awards scheme would not be achieved without the tremendous support of the government, the panel of judges, the participating companies and the wider business community. To this end, I would like to take this opportunity to thank all parties involved for their contribution and to congratulate the winners for their high degree of innovation and business value. Thank you for supporting the development of RFID technology. With the collective efforts of all stakeholders, I am sure that we can all have a bright and more sustainable future.

This casebook summarizes entries submitted for the 2011 Hong Kong RFID Awards that fell within the scope of the program. We hope that these outstanding cases will be an inspiration for others thereby triggering more innovations.

Anna Lin
Chief Executive
GS1 Hong Kong

Congratulatory Message

This is the fourth year the GS1 Hong Kong organises the Hong Kong RFID Awards. I am glad to see that the event has again successfully encouraged industry players to bring RFID technologies into their business operations.

The standard of the entries this year are high, candidates have displayed their outstanding achievements in deployment of technology in wide range of RFID applications, which undoubtedly benefit the industries as a whole in capturing new business opportunities and overcoming new challenges.

I am also happy to see that the U-21 RFID Awards has recognised the outstanding achievements of our young talents. It will surely encourage them to pursue technology as their lifelong career.

Innovation and technology development is a key driver of the economic growth. The HKSAR Government sees this industry as one in which Hong Kong enjoys clear advantage and will continue to strive to enhance Hong Kong's competitiveness and develop our city into an innovation and technology hub for the region. We will continue to provide an environment conducive to the development of high value-added and high technology industries in Hong Kong through our funding and infrastructural support programmes.

I would like to congratulate all the Award winners and we look forward to working closely with GS1 Hong Kong to develop our city into a regional centre of RFID excellence.

Miss Janet Wong, JP
Commissioner for Innovation and Technology
HKSAR Government

Hong Kong RFID Awards & Hong Kong U-21 RFID Awards

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 EPC identification numbers.

The Objectives

The Hong Kong RFID Awards scheme was first established in 2008. The awards program has been 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 implemented 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.

Hong Kong U-21 RFID Awards

In a bid to uplift the spirits of the Hong Kong RFID Awards, the first-ever Hong Kong 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 Awards Categories

The Hong Kong U-21 Awards has two categories. They are:

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.

Retrospect of Awards Journey

2008

Establishment of Hong Kong RFID Awards

2009

Hong Kong RFID Awards Commerical Sector Awardees

Establishment of Hong Kong U-21 RFID Awards

2010

Hong Kong RFID Awards were branded under Hong Kong Smart City+ Awards Program of World Expo 2010 Shanghai

2011: Cross-border Recognition

Introduction of Guangdong-Hong Kong RFID Awards
(粵港無線射頻識別大獎)

Introduction of Hong Kong-Taiwan EPC / RFID Academia Awards
(香港-台灣 大專學界EPC / RFID大獎)

2010-11 Hong Kong RFID Awards Programme Activities

Study tour for 2010 Awards winners to Shanghai World Expo

U-21 winners case sharing in the InnoCarnival 2011 organized by the Innovation and Technology Commission (ITC) of HKSAR Government.

RFID Awards Industry Success Story & Innovative Young Talents' Projects Sharing

Hong Kong U-21 RFID Awards Meet the Bosses Program: winning teams demonstrated their projects to leading RFID technology providers and pioneers

HK RFID Awards @ Facebook:
facebook.com/HKRFIDAwards

Message from the Judging Panel

Mr. Ian ROBERTSON, MBCS, CITP
Panel Chair
Director, Transport & Logistics and News Sectors, EPCglobal Inc.

This year was the fourth year of the Hong Kong RFID Awards and looking back it is interesting to see changing trends not only in the RFID technology itself but in how it is being applied in industry, government and academia. And this year we saw three distinct trends emerging in the competition submissions. Item level tagging is coming of age with some very innovative applications such as managing jade pieces in display cabinets that have no electricity supply! We saw the first application of RFID across an entire supply chain from sourcing raw materials in China to delivery into retail store in Europe indicating a broadening of application.

And as in previous years, the technology providers continue to surprise us with their innovations in terms of capability, size, cost and performance; the introduction of an ultra thin antenna being such an example this year. These are the signs of a technology becoming accepted into everyday use in industry, government and academia. The Hong Kong RFID Awards provide a competitive environment in which to drive innovation in RFID technology and its application while bringing down costs and increasing performance. The Hong Kong RFID Awards may be local but the benefits it generates are truly global.

Mr. Andrew C. W. LAI
Deputy Commissioner for Innovation and Technology
HKSAR Government

I am most pleased to see the very high quality submissions in the awards this year. The participants have not only stretched the boundaries of the RFID technology with their innovative ideas but also are creating new and added value for business operations.

This cross-over between innovation and entrepreneurship is the "right to win" in this knowledge-based economy. My sincere congratulations and best wishes to the winners of the awards.

Mr. Simon LANGFORD
Senior Director, Global Business Processes
Walmart Stores Inc.

WoW - Another year of new and innovative uses of RFID. I was impressed by the quality of the presentations but more so by how companies are innovating and putting RFID to work in the real world and driving real value for their companies. My congratulations go to not only the winners of the competition but all participants; in my eyes they are all winners as RFID is making a positive impact on their organizations, it is the application of the technology, coupled with the ongoing innovation by solution providers that continue to enable companies to drive efficiencies, improve accuracies and ultimately serve their customers better. Again many congratulations to the Winners!

Ms. Anna LIN
Chief Executive
GS1 Hong Kong

This marks the 4th anniversary for the Hong Kong RFID Awards and this year's event has been remarkably successful. The proof can be seen in the number of nominations, which came from an array of sectors manufacturers, healthcare sector, logistics services providers, global retailers, public services and utilities, as well as leading technology providers. The overwhelming feedback has also shown that the awards have achieved the aim of encouraging the local community to push the adoption of the technology forward in Hong Kong.

Mr. E. Anthony TAN
Chief Executive Officer
Hong Kong Science and Technology Parks Corporation

I was delighted to be one of the judges of the Hong Kong RFID Awards again this year. The outstanding quality of the projects serves as proof of the healthy and encouraging development of the EPC/RFID technology and its applications in Hong Kong. I would like to take this opportunity to congratulate all the winners on their achievements as demonstrated by the innovative applications presented by their projects. I wish this annual event of the industry a great success and hope it will continue to be an important platform to recognise and encourage the adoption of the EPC/RFID technology in Hong Kong and the Pearl River Delta region.

Dr. Frank TONG
Director, Research and Technology Development
Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies

Of course, my applause goes to the award winners. However, to me it is not just the titles of the awards. It is all the uncompromising efforts of our innovators and entrepreneurs prove once again that Hong Kong is vibrant with creativity and business ideas flourishing in the advance of the RFID technologies. Thanks indeed to all the contestants for their amazing ideas of RFID in good products and business applications. The pride belongs to you all!

Dr. Gerd WOLFRAM
Managing Director
METRO SYSTEMS GmbH

Innovation is the motor for growth in business. I was impressed by the high professionalism and variety of the different innovation projects and solutions around RFID/EPC. I congratulate the winners for this great achievement. All participants have shown great dedication to the development of innovative RFID applications. The projects show how the use of EPC/RFID applications can increase efficiency and effectiveness in the most diverse operational processes, and bring various benefits to the customers.

HK RFID Awards 2011

List of Awardees

Best EPC / RFID Implementation

ID² Tracer
Secure Information Disposal Services Limited

RFID Library Management System
3M Hong Kong Limited & The University of Hong Kong Libraries

End-to-End RFID Adoption in Supply Chains: Visibility, Innovations & Beyond
Center of Cyber of Logistics, Li & Fung Institute of Supply Chain Management & Logistics, CUHK, Cluster Technology Limited, LF Freight (Hong Kong) Limited, Schmidt & Co., (Hong Kong) Limited & SML Group Limited

Most Innovative Use of EPC / RFID

End-to-End RFID Adoption in Supply Chains: Visibility, Innovations & Beyond
Center of Cyber Logistics, Li & Fung Institute of Supply Chain Management & Logistics, CUHK, Cluster Technology Limited, LF Freight (Hong Kong) Limited, Schmidt & Co., (Hong Kong) Limited & SML Group Limited

ID² Tracer
Secure Information Disposal Services Limited

Tank Management System
Swire Coca-Cola Hong Kong

Most Innovative EPC / RFID Products

Use-IT-Easy: A Low Cost High Performance Mobile RFID Platform
Department of Management Sciences, City University of Hong Kong

CS468 16 Port UHF Fixed Reader & CS790 Ultra Thin Antenna
Convergence Systems Limited

MegaPad
Megabyte Limited

Certificate of Merits

Improved Verification Process on RFID Label Conversion
Aeroprint (E&A) Limited & Department of Management Sciences, City University of Hong Kong

RFID Supply Chain Collaborative Platform
Autotoll Limited & Department of Industrial and Systems Engineering, The Hong Kong Polytechnic University

LIBRA™ Library Management System
Central China Normal University & Hong Kong Communications Co., Ltd

e-Seal on Cross-border Customs
Long Sun Logistics Development Limited

RFID Monitoring System for Jade Display Cabinets
Megasoft Limited & Ping Zhou Jewelry & Jade Association

Winepedia
Nokia (HK) Limited & Schmidt & Co.,(Hong Kong) Limited

G-Formula System for Motor Retailer
SecurePro Technology Security System Limited

Winning Case Sharing

SSID
資訊機密處理有限公司
Secure Information Disposal Services Limited

GOLD — **Best EPC/RFID Implementation**

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

ID² Tracer

Background

Secure Information Disposal Services Limited (SSID) is a professional waste management company, which offers confidential waste paper disposal services to organizations. SSID was established in 2009 with a vision to set a new standard in confidential waste paper recycling.

Business Challenge

Organizations typically take one of two routes to dispose of confidential waste documents. They either shred the paper themselves or they outsource the task to a paper recycler with a shredding service. Self-shredding has a number of disadvantages. It can prove time-consuming using a light-duty shredder, or expensive using a heavy-duty shredder. Shredders also cause noise pollution in the office.

Outsourcing confidential waste paper disposal solves many of the problems of self-shredding, but has its own set of issues. Typically, there is no tracking of recycling bags, which makes it difficult to tell if any bags have been lost in transit, identify which customer's bags have been lost and recover them. This can compromise the security of the customer's confidential information. In addition, the lack of identification on bags means there is no way to retrieve a specific bag for a customer if important documents have been accidentally disposed of.

As a newcomer to confidential waste paper disposal established only two years ago, SSID was faced with the challenges of building trust in its service and differentiating itself from competitors. To meet these challenges, the company decided to harness RFID track-and-trace technology to bring end-to-end visibility to its service, ultimately providing customers with unparalleled transparency of the disposal service and enhanced security.

RFID Solution

SSID began by creating a task force to develop a workflow, encompassing the ordering, transportation and processing functions of the disposal service. Next, a study was conducted to identify suitable RFID tagging, equipment and software solutions. There were several considerations for the selection of the tag, including reusability, security, reliability, cost and compliance with recognized standards. The Mifare I, which can be re-written 100,000 times and meets ISO/IEC 14443 standards, was chosen for the project.

The ID² Tracer system developed by SSID has five trace nodes for the bags: upon delivery to the customer's premises, collection, loading into the vehicle, arrival at the processing facility and after processing is completed. Email notifications are automatically generated and sent to the customer when the bags arrive at the processing facilities and after the contents have been processed. At month end, customers receive an automatically generated summary of their service usage.

Benefits

SSID is the first company in Hong Kong to apply RFID technology to confidential waste paper disposal services. ID² Tracer allowed it to provide an unparalleled level of service, with end-to-end transparency of the waste paper disposal process for complete peace of mind, and traceability of individual packages for enhanced security. In a survey conducted by SSID, almost all of its customers said the RFID system was a key factor in their decision to use SSID. For SSID, the RFID track-and-trace system also has a number of operational benefits. The transportation team was able to **increase efficiency by 30%** and achieve a **100% collection accuracy**. ID² Tracer also **reduced manpower** for counting and searching for individual bags **by more than 50%**, allowing the company to retrieve and return bags for customers by the next day.

Lastly, the manpower needs of the customer service team were reduced by 70%, due to the automation of the ordering and reporting processes. SSID is planning to extend ID² Tracer. In the second phase of the project, it plans to extend the system to cover general paper waste disposal, track waste paper processing volumes and automate account receivables management. And in the third phase, the company plans to integrate ID² Tracer with its ERP system, enabling it to automate many human resources and accounting functions.

SILVER

Best EPC/RFID Implementation

RFID Library Management System

Background

The University of Hong Kong Libraries is a pioneer in adopting RFID-based library management system technology in Hong Kong. In 2008, it launched an RFID-based library management system for its Main Library after tagging more than 1.3 million volumes of books and bound journals. The system allowed the Main Library to manage book circulation and collection more efficiently, with many of the most time-consuming tasks fully or partially automated.

The success of the Main Library's RFID project led to the launch of a second project last year, which aimed to provide a RFID-based library management system to five branch libraries, namely Dental Library, Education Library, Yu Chun Keung Medical Library, Lui Che Woo Law Library and Music Library, as well as the Libraries' Audiovisual & Reserve Collection.

The contract was awarded to 3M Hong Kong Limited, which provides libraries with productivity and security solutions, including RFID systems, globally.

Business Challenge

The Libraries specified five main objectives for the new RFID-based library management system project. Firstly, the system must reduce manpower requirement in circulation areas by increasing rates of self check-in and checkout. Secondly, the system had to help staff maximize their productivity by reducing the amount of time spent on routine tasks, such as tracking lost items and taking inventory. Thirdly, the system had to improve service quality and workplace ergonomics. Fourthly, the system must enhance library security by minimizing unauthorized removal of library materials. Lastly, the new system had to interface seamlessly with the existing RFID system used by the Main Library.

RFID Solution

Based on past experience, the Libraries decided the most efficient way to carry out tagging was to take the item ID directly from the item barcode and program it into the RFID tag. The workflow and procedure involved was documented for easy reference, and tagging teams were established and trained to ensure the conversion process was fast and efficient.

The rewrite-able ISO RFID ISO 15693-3 and 18000-3 Mode I compliant tag, was chosen for the project for the long-term reliability of its adhesive. Additionally, the Stingray RFID tags were chosen to enable tags to be applied directly to CDs and DVDs.

A SelfCheck System which manages circulation and collection uses an LCD touch screen to guide users through the check-out or check-in process with easy-to-understand instructions, and audible and visual feedback at every step. A good user experience was crucial in order to increase patron acceptance. Besides, the Staff Workstation System, a circulation desk or tag programming station, processes multiple items at the same time, and supports both barcodes and RFID tags. It can also be used to program RFID tags and perform barcode-to-RFID conversions.

Another critical component of the new system was a Digital Library Assistant, a lightweight cordless handheld RFID reader allows staff to accomplish many collection and shelf management tasks at far greater speed, including identifying status of library materials, shelf-reading, shelving assistance, searching, data collection, pulling items and finding items.

Benefits

The key benefits of the new library management system were **improved staff productivity, high self-checkout rates, enhanced security, improved inventory accuracy and more efficient data collection**. With less time spent on circulation and shelf management tasks, staff could devote more time to helping patrons individually, thus improving the level of service and the library experience for patrons. Crucially, the new library management system was integrated seamlessly with the existing RFID solution at the Main Library, providing cost-effective interoperability.

Having RFID-tagged the entire open-stack collection the Libraries will continue to take full advantage of the technology to enhance library services, increase staff productivity and improve users' library experience.

End-to-End RFID Adoption in Supply Chains: Visibility, Innovations & Beyond

Best EPC/RFID Implementation **Most Innovative Use of EPC/RFID**

Background

An efficient, synchronized supply chain is crucial to competitiveness in the fashion industry, where time-to-market significantly affects profits. Li & Fung, a major global sourcing and distribution company in the fashion and accessories industry offers a wide range of integrated supply chain management solutions through its logistics arm, LF Logistics, to optimize and orchestrate logistics flows from factories to retail points. This project involved one of LF Logistics' high-end, fast growing fashion clients, a company which had a well-established, typically structured garment manufacturing supply chain.

Business Challenge

Li & Fung's client stores its sourced fabrics at Li & Fung's distribution centre in Hong Kong before sending them on to external parts suppliers in Shenzhen for cutting and processing. The fabric parts are then transported to the garments factory in Hong Kong for production. However, if there were production delays at the external parts suppliers, the garments factory in Hong Kong would only become aware of the issue on the day the parts were expected to arrive. It was not uncommon for such issues to double the production lead-time.

Moreover, the Hong Kong distribution centre was a passive supply chain partner. It was not able to anticipate demand. It would usually receive stock replenishment orders in the morning and have to ship the order out by the late afternoon. Due to the complexity of the supply chain and the lack of automation in certain critical processes, it was very difficult for the client to gauge supply chain performance and to identify supply chain issues until disruption had already been caused.

RFID Solution

A project team was formed at the Center of Cyber Logistics, a research centre under the Li & Fung Institute of Supply Chain Management & Logistics at The Chinese University of Hong Kong to address the challenge. The project team analyzed the supply chain and designed the RFID supply chain solution, collaborating with client and its supply chain service providers, LF Logistics to address supply chain performance issues, SML Group for tagging, Schmidt & Co for RFID applications, and Cluster Technology for the visibility platform. The supply chain structure processes were mapped and analyzed using a SCOR (Supply Chain Operations Reference) model. Numerous site visits and interviews were conducted to fully understand the supply chain business processes. A total of 24 RFID hotspots were identified to gauge performance in strategic supply chain processes.

In the system designed by the project team, an RFID tag was firstly attached to the core of a fabric roll when the fabric was received by the distribution centre. When the fabric parts were made, the parts tags were then automatically associated with the fabrics tag using a custom-designed RFID handheld device. At the end of production, the RFID tags are re-used and attached to the finished garment, allowing the parts to be associated with it.

Meanwhile, a web-based visibility platform was developed to store data captured from the RFID hotspots across the entire supply chain. This required the RFID data to be associated with existing ERP data. As there were different types of ERP systems used along the supply chain, an additional cloud-based application was developed to interface with and retrieve data from the various ERP systems. The visibility platform was browser-based and user-customizable, allowing the different supply chain partners to create visibility templates containing only information that is relevant to them. The external parts supplier, for example, may only wish to see production orders, EPC codes, item IDs such as SKUs and current locations of fabrics. Several default templates were developed for user convenience.

Benefits

The project delivered several end-to-end operational benefits, improving operational efficiency and reducing time-to-market in the process. **Manpower required for stock taking by the fabrics warehouse and external parts supplier has been significantly reduced**. The fabrics warehouse has doubled the volume of fabric it can receive each day from 50 to 100 rolls, while the external parts supplier can now instantly verify whether it has received the correct fabrics for processing.

With full visibility of the supply chain, **production planning has been improved along the supply chain**. The garments factory, for example, can now **closely monitor the work-in-progress** at the external parts supplier in real time and make appropriate adjustments in its production planning. For the garment warehouse, the ability to monitor production means it can see what stock is arriving further ahead of time and optimize warehouse space allocation accordingly.

A transparent supply chain also provides various insights to improve the supply chain, including fulfillment cycle times, quality defects occurrences and inventory management. Following the success of the project, the project team is now looking to explore how it can apply the visibility platform to other supply chains and make further enhancements to the platform.

SWIRE COCA-COLA HK

Tank Management System

BRONZE

Most Innovative Use of EPC/RFID

Background

Swire Coca-Cola Hong Kong (SCCHK) is Hong Kong's leading soft drink manufacturer. The company operates 17 production lines and employs nearly 1,500 employees, producing more than 60 million unit cases annually. The company, a major supplier of syrups and carbon dioxide (CO_2) cylinders for post-mix soft-drinks, also provides dispenses machines to restaurant chains in Hong Kong.

Business Challenge

SCCHK supplies CO_2 to roughly 3,000 customers in Hong Kong. With more than 10,000 cylinders in circulation, the company aims to create an efficient inventory tracking and asset management system to enhance operational efficiency and product traceability. The company evaluated several technologies and identified RFID (UHF) based technology as the most effective and reliable means for tracking and managing its inventory of cylinders in the market. With an RFID (UHF) solution, the company wanted to accurately track quantities, status and locations of its cylinders, and to help monitor whether customers apply First-in-first-out (FIFO) procedures in handling CO_2.

Another important aim of the project was to enhance food safety through fast and accurate inventory traceability. Lastly, the company wanted to increase the efficiency of the license renewal process for its CO_2 cylinders. Under Hong Kong law, the cylinders require inspection every five years to obtain license renewal from the government.

RFID Solution

SCCHK worked with a technology partner to help source hardware and set up the infrastructure for the project. In designing the system, the company also addressed environmental challenges, such as, signal interference from the metallic surfaces of the cylinders and the racks on which the cylinders are placed, and potential damage to the tags caused by transportation and storage of the cylinders on client premises that could affect the reliability and performance of the RFID tags.

To tackle these issues, SCCHK and the technology partner customized the RFID tags, by applying a special plastic lamination, to make them easier to install, significantly more durable, and with improved read and write reliability. The enhanced packaging also allowed the tags to withstand harsh weather conditions and extreme temperatures (-10°C to 82°C) during cleaning.

The company chose handheld readers, which could be used flexibly in productions areas for writing data to the tags and recording production data, in warehouses for recording inventory data, and in customer premises for confirming delivery and recording the return of empty cylinders. For ease of inventory tracking and asset management, 32-digit RFID tags capable of storing a range of data (including cylinder ID, SAP batch number, article number and inspection date) are used.

Benefits

The RFID inventory tracking and asset management system provides tracking and tracing from the production floor to warehouse to customer outlets. In factories, data from tagged cylinders are read, transferred directly to a centralized database, and processed by an asset management system. On client premises, the data read from the tagged cylinders are stored temporarily on the handheld readers. The solution provides management with instant access to key data including: the location, condition and maintenance record of each cylinder, the number of non-returned cylinders by customer, and stock rotation status.

As a result of implementing the system, SCCHK expects a **50% reduction in cylinder loss** and **30% reduction in stock taking time**. It also expects a shortening of the time required to locate problematic cylinders from more than one hour to less than five minutes, and **improvement in accuracy of inventory-life recording to 100%**. From a qualitative perspective, the RFID tracking system allows the company to enhance customer service with FIFO monitoring on customer premises, helps the company to comply more efficiently with the government's five-year safety check requirement, and assists the company with achieving sustainable business goals, such as cylinder recycling.

Looking ahead, the company plans to improve and extend the system in several ways, including: building a web access point to provide customers with order and delivery status, introducing digital signature pads to acknowledge product receipt, and extending the RFID applications to include post-mix tank products.

香港城市大學 City University of Hong Kong

Department of management sciences

GOLD

Most Innovative EPC/RFID Products

Use-IT-Easy: A Low Cost High Performance Mobile RFID Platform

Background

For any technology to become successful or widely adopted, the cost of adopting the technology must decline to a level that potential users see value in purchasing it. For RFID technology, this process has been taking place for years, but prices have not fallen enough to drive mass adoption. While the cost of RFID tags have dropped over the past five years, RFID readers remain relatively expensive to purchase and most are designed for industrial rather than office applications. City University of Hong Kong's Use-It-Easy USB Reader project was launched to explore ways to address this issue.

Business Challenge

Most of the handheld RFID readers on the market today are heavy and bulky, making them unsuitable for anything other than industrial applications and work processes. In addition, many of these handheld readers are expensive, further raising barriers to adoption, particularly by smaller businesses.

To tackle these issues, City University of Hong Kong set itself the challenge to build a handheld reader with affordability, ease of use, compactness and lightweight as its key design goals. The solution had to be at a price point that would not exclude purchasing by individual users, and offer true plug-and-play convenience. It also had to have cross-platform compatibility with all major desktop operating systems, including Linux, Mac OS X and Windows, as well as popular mobile computing platforms. In addition, the handheld reader had to meet international standards for full interoperability.

RFID Solution

In order to ensure the reader was inexpensive, the hardware engineering team evaluated many UHF RFID integrated circuits and other components, searching for the right balance between cost and performance. The aim was to keep the bill of materials as low as possible but ensure the Use-It-Easy USB Reader would offer reliable and stable performance.

Plug-and-play convenience was achieved by designing the handheld reader as a USB device. Conforming to USB-HID (Human Interface Device) specification, the handheld reader could output data to any application on any desktop operating system, just like a USB keyboard.

In terms of software, software development kits (SDKs) were created for Windows, Mac OS X and Linux, as well as for mobile platforms, Google Android and Windows Mobile.

These SDKs were designed to be very simple to use so that even beginner programmers could start their own applications for the handheld reader.

Lastly, the handheld reader was designed to be compliant with major international RFID standards, including ISO 18000-6C and EPC Global Class 1 Gen 2.

Benefits

The Use-It-Easy USB Reader is not only inexpensive but also easy to use with convenient plug-and-play installation. Weighing in at only 120g, it is also very light, yet can achieve a reasonable read distance of more than a meter.

Crucially, the Use-It-Reader is designed to be sold at a price point that significantly lowers the cost of ownership of EPC/RFID equipment. This lowers the barriers to adoption, particularly for smaller businesses, including SOHO (small office/home office) businesses, and small and medium enterprises, which form the backbone of every economy.

Going forward, the City University team is looking to develop the device into an add-on component that can work with Apple iOS and Android devices and smartphones. This, in turn, would make it more accessible to consumers, driving even wider adoption of EPC/RFID technology.

CONVERGENCE SYSTEMS LIMITED

Most Innovative EPC/RFID Products

CS468 16 Port UHF Fixed Reader & CS790 Ultra Thin Antenna

Background

Founded in 2000, Convergence Systems Limited (CSL) is a leading RFID equipment maker, which designs and manufactures a broad range of RFID products, including passive and active RFID readers and tags. The company also provides support to system integrators involved in logistics, supply chain management, manufacturing, security management, transportation, and retailing.

Business Challenge

An efficient RFID tracking system enhances document or goods management efficiency by improving visibility and traceability. It streamlines asset management, while eliminating human error from processes. However, most existing UHF RFID readers and antennas have several constraints that prevent them from being used to maximize the potential of RFID documents and goods tracking. Many RFID tags are bulky, which makes them difficult to install, and have a wide, poorly defined reading zone. Many readers operate on too much power and cannot be configured to use less. They can also have slow read rates and can only read one tag at a time. In addition, many readers have fixed applications, which limits how they can be used in different scenarios. There are high performance readers that do the job better, but these are generally expensive, deterring investment in them by many businesses.

CSL wanted to address these issues by creating a new compact size UHF RFID 16 port-reader along with an ultra-thin antenna suitable for document management and retail applications. Unlike traditional readers with long read range and high read rates, the new solution would be focused on accurate performance in a limited space. The reader had to be slim enough to be used in an office or retail environment, while avoiding potential overheating due to the compact form factor and power required for high processing speed. The design of the antenna had to be thin enough to be easily attached to documents or objects in display cabinets, and have a tightly controlled RF signal. Lastly, the reader had to be at an excellent price-performance point to lower barriers to investment.

RFID Solution

To accomplish the challenge, CSL designed the CS468 16-port fixed reader and CS790 ultra-thin antenna. The CS468 reader can achieve read rates of up to around 300 reads per second per port and has a maximum power output up to 27dBm that is adequate to meet most retail and document management needs.

The CS790 antenna is only 6mm thick, which allows it to be embedded in space-limited environments, such as retail display cabinets and bookshelves. Moreover, the well-developed open-source front-end software allows users to easily create their own application and integrate it into their system with short development times.

Benefits

This breakthrough solution has a wide range of business benefits for offices and retailers. It will provide users with full real-time visibility of assets. For example, an office-based user can track the total number of documents on an RFID-enabled smart shelf and verify if there are any missing or misplaced documents. With the ultra-thin antenna, the user can also quickly and easily locate misplaced documents.

In a retail environment, an ultra-thin antenna embedded in a display cabinet can be used to alert users when an item is absent. Moreover, in a product display kiosk, the system can be used to identify what product a customer has picked up and display relevant product information. This, in turn, enhances, the customer's shopping experience.Retailers will also find it useful for collecting data for customer behaviour analysis by recording what products have been picked up the most, enabling them to optimize their product strategy to maximize returns.

CSL plans to adapt the new solution for different applications by using different casing materials and developing ultra-thin antennas with different read lengths for use in different environments.

megabyte

MegaPad

Most Innovative EPC/RFID Products

Background

Established in 2008, Megabyte Limited develops UHF RFID devices and Middleware Software, including RFID Reader, Handheld Device and Antenna. The company specializes in RFID solutions for the retail, fashion, pharmaceuticals and security industries, as well as archive management.

Business Challenge

While most business records are stored on computer servers in the modern world of business, many companies still need to maintain physical documents. For some companies, efficient management of these assets can be critical to day-to-day operational functions, protecting intellectual property, safeguarding personal information about customers and staff, and securing legal and financial records.

However, document management in most companies is a manual task, which makes it susceptible to human error. Documents can and frequently do get lost or misplaced, causing operational disruptions, undermining business reputation and consuming manpower.

RFID Solution

To address these needs, Megabyte created the MegaPad RFID reader and AiiT intelligent real-time asset tracking software to provide companies with a cost-effective, reliable and scalable solution for tracking and managing access to documents. The MegaPad is a UHF EPC C1G2 (ISO1800-6C) RFID reader with an embedded antenna, and features both LAN and WiFi connectivity for ease of connection to a network.

MegaPad works with the RFID enabled intelligent software to provide companies with easy-to-use, simple-to-install real-time document tracking and management capabilities. While other RFID implementations in document tracking may use equipment that has been designed for industrial applications, such as high-powered fixed readers, industrial antennas and dedicated servers, the MegaPad and the RFID enabled intelligent software have been purpose-built for document management in an office environment.

The MegaPad is designed to look like a conventional document tray. This allows the system to blend with the office environment and look unobtrusive, which enhances user acceptance. The only differences to a normal office tray a user may notice are the discreet programmable LED lights and a buzzer for user events.

On the software side, MegaPad RFID reader is supported by the RFID-enabled intelligent software, which provides users with real-time monitoring of all tagged items placed on connected MegaPads.

In the RFID enabled intelligent software, the Megaware Server is the centralized control unit and repository for all devices, including MegaPad. It configures, connects and controls all devices, to collects and consolidates all captured information by RFID technology and to provide the location and movement information for the tracking documents and items.

MegaPad complies with various open standards and protocols for high interoperability, including EPC Global Class 1 Gen 2/ISO 18000-6C, and supports global UHF RFID frequency bands including FCC 902-928 MHz, ETSI 865-868 MHz, SRRC 919-928 MHz and SRRC 920-925 MHz. The solution can be expanded with multiple connected MegaPads used to create a company-wide RFID-based asset management system.

Benefits

By allowing users to both track the real-time location of documents and trace document movement history, the MegaPad allows companies not only to quickly locate documents and minimize manual document handling errors, but also optimize operational processes by analyzing the usage and movement of documents around an office and reduce paper-based book keeping procedures.

MegaPad can also be used for attendance monitoring and access control. Unlike traditional barcode or LF/HF RFID systems, this UHF RFID reader can be read from much further distances and read multiple items at the same time. Information about employee access, attendance, and duties performed can be easily and efficiently monitored and recorded on a database via a network.

MegaPad can also be used as part of a larger integrated RFID asset management and access control system, which involves smart shelves, smart cabinets and handheld readers for the ultimate in document management.

Certificate of Merits

Improved Verification Process on RFID Label Conversion

Aeroprint is Hong Kong's largest supplier of specialized labeling and tagging solutions, including thermal boarding pass printing and smart baggage tags, to the airline industry. The company also offers printing solutions for secure administrative documents, such as waybills and miscellaneous charges orders. Aeroprint wanted to optimize the performance of its RFID label conversion machine, which has a built-in RFID reader for label verification andvalidation. The label conversion machine only had one read point on the machine, which was at the insertion stage. If RFID label verification was performed at the same time as label conversion, the machine's throughput would slow down significantly. Additionally, the machine did not have an RFID tag verification system.

To solve these issues, the company collaborated with City University of Hong Kong to design an external RFID label verification module, using a USB RFID reader with an antenna, which could be powered and controlled by the laptop already available with the conversion machine. A software application was created to provide real-time reporting, including the tag read count, missed or unreadable tag count and audible alert, and tag ID and information log. Since implementing the new tag verification system, the machine's throughput has become approximately 60% faster and is able to create high quality RFID labels.

RFID Supply Chain Collaborative Platform

Autotoll is a leading transport and logistics management solutions provider, which operates electronic toll collection services across Hong Kong. Working with The Hong Kong Polytechnic University, the company established the RFID Supply Chain Collaborative Platform (RSCCP) to enable their logistics flow for Hong Kong-China cross-border cargo transportation to be simplified, enhance the efficiency of food safety monitoring and inspection at Hong Kong land border control and customs clearance operations, and enable greater logistics automation and supply chain visibility.

RSCCP uses a Logistics Visibility Information System, which consists of four main modules: Intelligent eSecurity Device Management, Fleet Management, Cargo Tracking and Tracing, and Job Order Optimization. Bringing together various logistics-enabling technologies, the system can connect with public information sharing platforms, such as On-board Trucker Information System (OBTIS), to display the real-time status of containers and trucks. In addition to real-time supply chain visibility and improved cross-border transportation management, RSCCP offers enhanced cargo security thanks to the eSeal technology built into the Intelligent eSecurity Devices. Real-time monitoring of the Intelligent eSecurity Devices enables RSCCP to send out an alert immediately after an eSeal has been broken, allowing companies to respond to security breaches more quickly. The project team plans to expand the functionality of the platform to include calculating the carbon footprint of transported cargo.

LIBRA™ Library Management System

Hong Kong Communications (HKC) is a Hong Kong listed telecommunications equipment supplier, which has been operating in the Asia-Pacific telecommunications industry for more than 40 years. The company was contracted by the Central China Normal University (CCNU) to implement its LIBRA™ Library Management System to improve the efficiency of the checking out and returning of books for patrons at its library, as well as the management of the library's more than 2.8 millions books. CCNU wanted the system to be customizable to meet the individual needs of patrons, compatible with the library's existing library management system, and enable simultaneous self-check-out and return of multiple books.

After strategic ground planning and site surveying, HKC implemented and tested the new RFID-based library management system and trained staff at the CCNU library in its use. Compared with the original barcode based system, the LIBRA™ Library Management System enabled significantly faster check-out and searching for books, enhancing the user experience for patrons. In addition, with greater automation of repetitive tasks, such as sorting returned books, librarians could focus more on delivering a better level of customer service to patrons, while fixed operational costs fell due to lower man power demands. The system has also recently introduced a 24-hour book-drop facility.

e-Seal on Cross-border Customs

Long Sun Logistics Development (LSLD) was contracted by the Hong Kong Customs and Excise Department (HKCED) to help develop a track-and-trace system that would allow checkpoint operations for cross-border truck traffic to function more efficiently. In particular, LSLD was tasked with shortening checking time and alleviating cross-border truck traffic congestion, improving operational workflow, lowering operational costs, and enabling tracking of individual vehicles in large volumes.

Prior to the installation of the RFID track-and-trace system using e-Seal RFID tagging devices, the HKCED was not able to track the status of vehicles after the vehicles had left the department's land boundary control points. Now with the system in place, the department can track and trace the status of individual trucks on the road in real time, with the ability to monitor their route, speed and irregularities, such as damage and authorized opening of locks. In this way, the system not only helps the department speed up checkpoint operations, but also enables it to combat smuggling activities more effectively. For truck drivers and transport companies, the system also means shorter delivery times, increased turnover and lower operating costs, making it a win-win situation for all stakeholders.

RFID Monitoring System for Jade Display Cabinets

Security for high value jewelry can be a difficult challenge in an exhibition environment where there is a constant flow of visitors. Ping Zhou Jewelry & Jade Association (PZYQ) wanted to develop an RFID-based security system that would allow it to monitor the status of each individual item of high value jade jewelry being displayed during exhibitions, allowing the movements of more than US$28 million worth of jewelry in and out of cabinets to be monitored. On top of this, the association wanted the system to be self-powered, as the exhibition hall did not have power points in close proximity to stalls and could not accommodate electrical wiring.

Megasoft Limited designed a centralized RFID-based asset monitoring system to track and trace item movements in every cabinet, providing a real-time inventory count of all items inside the exhibition and sending out alerts to the exhibition administrator when it detected unauthorized item movements. The platform provided a clear graphical representation of the status of all items. In addition, Megasoft deployed RFID-enabled MegaTrays at the exhibition hall, so the status of the items could continue to be monitored outside of the cabinets. This not only helped reduce the threat of theft but also allowed the PZYQ to fine tune its inventory management procedures.

NOKIA SCHMIDT MAKES LIFE SIMPLE

Winepedia

Smartphones have permeated every daily life. Through near field communication (NFC) technologies, smartphones can provide consumers with access to information about any products when they are out shopping. Nokia wanted to leverage these technology trends to develop a comprehensive smartphone-based information database solution for wines, which would allow wine lovers to make better informed decisions when selecting from the huge variety of wines available in the market, while also providing wine retailers with an effective marketing platform.

Winepedia uses RFID tags embedded with a URL. This URL can be sent to a smartphone via NFC technology, allowing consumers to learn more about a bottle of wine, including palate, color, varietals and origin. If the user decides to buy the wine, Winepedia provides locations of stores where the wine is available and can also provide a map and route to the nearest store. For wine retailers, the benefits of Winepedia are greater marketing intelligence through data collection and analysis, influence over consumer buying decisions, and dissemination of advertising and promotions. At the same time, Winepedia enhances the shopping experience for consumers, providing unparalleled interactivity, convenient access to information, and time savings when determining product availability.

G-Formula System for Motor Retailer

SecurePro Group provides customized, RFID solutions and professional consultancy services to organizations in the Greater China region and around the world. The company identified an opportunity to develop an RFID solution designed especially for car retailers that would increase supply chain management efficiency by automating supply chain processes, reducing inventory levels, generating human resource savings and enhancing sales support services. The SecurePro G-Formula System that the company installs active RFID tags on windshields to track the vehicles. RFID readers and antennas were installed at all access points, and in the parking areas and work bays of warehouses and service centers. A central server was deployed to monitor car vehicle movements, supported by close-circuit cameras and a vehicle license plate recognition system.

After implementing the G-Formula System, storage planning efficiency increased from 50% to 95%, while the manual labor required to check inventory and locate cars was reduced from 8 hours per day to 30 minutes, and the accuracy of the check-in and check-out process rose to 95%. In addition, with the patented Video Real Time Image Chasing System (RTICS) technology, security on premises was enhanced considerably. Together with the RFID tracking system, unauthorized access to vehicles was eliminated. Ultimately, the RFID-based security system helped the car retailers build up greater trust with customers.

Hong Kong U-21 RFID Awards 2011
Message from the Judging Panel

Mr. Anthony S. K. WONG, S.B.S., J.P.
Panel Chair
President, China and South East Asia, One Laptop Per Child (OLPC)

I am very pleased to see a progressive improvement in the quality our students in Hong Kong to the U-21 RFID Awards over the years. It is an indication of the increased awareness and interest of our students in the application of the RFID technology. Amidst the submissions there is no lack of originality and innovation. Indeed many of the ideas and concepts presented by the students could readily be realized in actual applications.

I congratulate GS1 Hong Kong for the success in hosting the HK U-21 RFID Awards and thank all the sponsoring and supporting organizations.

Dr. Hubert Chung Yee CHAN, J.P.
Chairman
GS1 Hong Kong EPC Partners Advisory Board

This year I was pleased again to see many innovative solutions and varied implementations presented from our students in Hong Kong. I was most delighted to see some of the solutions could be used to improve service quality for the elderly care and increase the awareness in Green issue.

I especially send my congratulations to the winners of the awards. I wish to see more innovative solutions will be deployed in the community in the future.

Ir. Stephen K. M. LAU, J.P.
President
Hong Kong Computer Society

I am honored to be a Judge for the HK U-21 RFID Awards 2011 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. K. K. SUEN
Chief Architect and Principal Consultant
GS1 Hong Kong

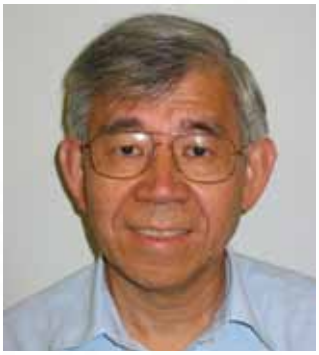
Each year the quality of the U-21 RFID Awards entries is extremely impressive, and this year is no exception.

The high degree of innovation and creativity shown in the entries has made the judging process more difficult, validating the innovative and entrepreneurial strengths of Hong Kong's young generation. I applaud all the participants for their creative ideas and achievements in technology innovation.

Ir. Paul W.K. WU
Senior Manager, Special Systems
Airport Authority Hong Kong

It was my great honor to serve as the Panel Judge for the HK U-21 RFID Award this year. I found it most difficult to select the Award winners as all the proposed projects were set at a very high standard with innovation and practicality in the application of RFID technology closely related to our daily lives. I was particularly impressed with the young students to present their outstanding projects in a simple way before my professional judges with courage and commitment which showed they do really understand well enough their concepts and proposals.

I must thank not only the hard work and the great effort from these students but also their Project Supervisors' unfailing support behind the scene. Lastly, I congratulate GS1 HK in organizing similar successful events consistently each year with the vision to drive Hong Kong to become a leading international city of RFID excellence.



Prof. On Ching YUE
Science Advisor, Innovation and Technology Commission
HKSAR Government

Congratulations to all the students who submitted entries to the U-21 RFID Awards Competition. By spending the effort to think of innovative applications of RFID technology and solve engineering problems in implementation, you are all winners already.

I particularly enjoyed hearing the ideas from the non-engineering students who have identified needs and opportunities in everyday life. Hope that this experience would encourage you in your future career to continue to apply technology to improve the quality of life in society.

List of Awardees

Best EPC / RFID Concept

RFID-based Carbon Leveling Information Platform (RF-CLIP)

Students Cheng Cheung Tong Thomas, Yeung Chui Ling Charlie

Supervisors Dr. Andrew W.H. Ip, Dr. Sandy S. To, Dr. Benny C.F. Cheung

Department of Industrial and Systems Engineering

The Hong Kong Polytechnic University

Simultaneous Score-counting System in Bun Scrambling Competition

Students Chau Yee Lei Crystal, Man Hon Fung, Wong Chun Ho, Yee Hoi Ting

Supervisor Dr. Wilson W.S. Lu

Department of Real Estate and Construction

The University of Hong Kong

Smart Elders, Smart Homes: Development of E-Home - Elderly Home Care Management System

Students Cheng Wing Chi, Tam Pik Kwan

Supervisors Dr. Fion C.H. Lee, Mr. Simon P.Y. Chan

Division of Commerce

Community College of City University

Most Innovative EPC / RFID Application

Resources Management System for Robot Institute of Hong Kong (RIHK)

Students Chan Yun Chak, Leung Fai Yiu, Suen Hing Chuen, Tang Yue Tsun

Supervisor Ms. Elaine W.L. Cheng

Department of Information and Communications Technology

Hong Kong Institute of Vocational Education (Tsing Yi)

RF-ICE: An RFID-based Intelligent Caring System for Improving Service Quality to Residents in Elderly Home

Students Lam Hoo Kwong Nathan, Tseung Ka Ling Lydia, Wong Kin Lok Kev

Supervisors Dr. George T.S. Ho, Dr. Jacky S.L. Ting

Department of Industrial and Systems Engineering

The Hong Kong Polytechnic University

Smart Luggage System

Student Chan Sin Lun Thomas, Yu Yi Yan Ada

Supervisor Dr. Henry Chan

Department of Computing

The Hong Kong Polytechnic University

Certificate of Merits

RFID Watch for Primary Student's Attendance System

Students Chan Kit Mui, Lo Ying Tung, Wong Chui Yan, Wong Man Yee Maggie
Supervisor Mr. Tommy K.K. Leung

Department of Engineering Management and Technology, Hong Kong Institute of Vocational Education (Lee Wai Lee)

RFID Medical Card

Students Chong Ko Sing, Chu Pui Kin, Lam Hau Yan, Ma Chun Kan, So Kwok Wing
Supervisor Mr. Yiu Cheuk Man

Business Administration Department, Hong Kong Institute of Vocational Education (Sha Tin)

Patient Missing Avoiding System

Students Chang Ho Lam, Cheng Chi Fung
Supervisor Mr. Eric K.W. Fung

Department of Engineering, Hong Kong Institute of Vocational Education (Tsing Yi)

RFID Enabled Human Resource Management and Inventory Control System

Students Chan Yan Chi, Cheung Tsz Yan, Choi Lai Kuk, Chung Chun Tung
Supervisor Mr. Woo Hok Luen

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

RFID Technology on Sport Retail Store

Students Leung Ho Tak, Mak King Hei
Supervisor Dr. Huang Jian Wei

Department of Information Engineering, The Chinese University of Hong Kong

RFID-based Automatic Air Cargo Measuring and Weighing System

Students Cheng Shek Fung, Liu Yudi, Siu Siu Hang
Supervisor Dr. Henry Chan

Department of Computing, The Hong Kong Polytechnic University

RFID-based Green Mobile Logistics Management System

Student Siu Siu Hang
Supervisor Dr. Henry Chan

Department of Computing, The Hong Kong Polytechnic University

RFID Application in Museum

Students Chen Fang Qi, Chen Ying, Lee Tsz Yi, Ye Yan Shuo
Supervisors Dr. George T.S. Ho, Dr. Jacky S.L. Ting

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

RFID-based Strengths Management System (RF-SMS) for Psychiatric Rehabilitation Services

Student To Ching Yan Echo
Supervisors Dr. Albert H.C. Tsang, Dr. Jacky S.L. Ting

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

Development of a Finished Goods Control System with RFID Technology for a Magnetic Recording Head Manufacturer

Students Lee Uen Yan, Lam Chun Kong, Wong Ka Cheong
Supervisor Dr. Albert H.C. Tsang, Dr. Luk Chi Fai

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

RFID-Enabled Just-in-Time Logistics Management System for "SHIP" – Supply Hub in Industrial Park

Students Cao Nan, Li Zhi, Luo Hao, Pang Lam Yu
Supervisors Prof. George Q. Huang, Dr. Ting Qu

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

RFID-Enabled Engineering Workshop Training Center

Students Fang Ji, Fu Pin Xin, Qiu Han Rui, Zhong Run Yang
Supervisors Prof. George Q. Huang, Dr. Dai Qing Yun

Department of Industry and Manufacturing Systems Engineering, The University of Hong Kong & Faculty of Information Engineering, Guangdong University of Technology

Winning Case Sharing

Best EPC / RFID Concept

RFID-based Carbon Leveling Information Platform (RF-CLIP)

Students Cheng Cheung Tong Thomas, Yeung Chui Ling Charlie
Supervisors Dr. Andrew W.H. Ip, Dr. Sandy S. To, Dr. Benny C.F. Cheung
Department of Industrial and Systems Engineering
The Hong Kong Polytechnic University

Global warming is a hot issue and if no action is taken to reduce greenhouse gas emission, including carbon dioxide, the greenhouse effect will further affect the lives of our children in the decades to come. The RFID-based Carbon Level Information Platform (RF-CLIP) concept was devised by the Hong Kong Polytechnic University to better inform end-consumers and corporate consumers on the global carbon footprint of their purchases.

RF-CLIP's architecture consists of three-layer systems including persistence layer, business logic layer, and presentation layer. The persistence layer is a permanent system database used to maintain all the information from the business logic tier. The business logic tier has two engines: the Carbon Footprint Engine, which collects data from the supply chain to calculate a product's carbon footprint and the Dynamic Pedigree of Carbon (PoC) Engine, which dynamically grades a product's carbon footprint. The presentation layer allows consumers to recognize the product carbon footprint using RFID and Near Field Communication (NFC) technology. The benefits of the system is an unprecedented level of accuracy in measuring the carbon footprint of products in item-level, plus a user-friendly platform that can be used to facilitate ethical consumers and social responsible corporations to trace a specific product's carbon footprint with reference to their grading and value of carbon footprint. This allows consumers to be informed of the impact of products on the environment before making any purchase. Importantly, the RF-CLIP system is also extensible to include information about other greenhouse gasses (such as, methane, nitrous oxide and the F-gases) and compatible with the EPCglobal Network Infrastructure and RFID-based warehouse management systems, which can ensure products are truly traceable, well-managed and environmentally friendly in the whole supply chain. Being a "Green" Most Valuable Platform (MVP), RF-CLIP would like to encourage the concept of One "Dood" One Save to support sustainable environmental development.

Simultaneous Score-counting System in Bun Scrambling Competition

Students Chau Yee Lei Crystal, Man Hon Fung, Wong Chun Ho, Yee Hoi Ting
Supervisor Dr. Wilson W.S. Lu
Department of Real Estate and Construction
The University of Hong Kong

The bun scrambling competition at the Cheung Chau Da Jiu Festival is one of the most famous and distinctive traditions in Hong Kong. Every year on the 8th day of the fourth month of the Chinese lunar calendar, the Cheng Chau villagers hold a seven-day thanksgiving festival. As part of the celebrations, three giant 60-feet towers are erected out of bamboo scaffolding near Pak Tai Temple in Cheung Chau and covered in buns for an ancient race in which young men would climb the towers at the midnight to grab the buns. The higher the bun is located, the more fortune it would bring to the family of the holder.

In the modern day version of this race, 12 participants are given three minutes to climb up the three bun towers to grab buns and come back down. Using RFID technology, the University of Hong Kong believes the organization and management of the race can be improved. The project requires all buns to be installed with RFID tags and RFID readers to be fitted into the baskets used by participants to collect the buns. The reader, in turn, would relay a bun count for each participant to a server, allowing organizers to keep a live score. The system promises a number of key advantages, including improved accuracy and speed of bun counting and greater excitement for spectators as live scores can be tracked to see who is winning the race. The system would also help the organizers to easily track and re-use buns, whereas normally many buns are lost.

Smart Elders, Smart Homes: Development of E-Home - Elderly Home Care Management System

Students Cheng Wing Chi, Tam Pik Kwan
(Current undergraduate students of The City University of Hong Kong)
Supervisors Dr. Fion C.H. Lee, Mr. Simon P.Y. Chan
Division of Commerce
Community College of City University

香港城市大學專上學院 Community College of City University

Population aging in Hong Kong is becoming an increasingly significant issue. Many elderly people are living alone and lack care. The Elderly Home Care Management System (EHCMS) project, proposed by Community College of City University, aimed to address this issue using RFID technology to enhance home safety, enable a higher level of communication with friends and relatives, and help elderly people maintain their independence.

The EHCMS consists of four sub-systems. The Toilet Safety System uses an RFID reader installed at the bathroom door to monitor how long the user spends in the bathroom and alert a care worker to check on the user if the user has been in the bathroom longer than normal. The Belongings Checking System also uses a reader, but to keep track of tagged items the user is carrying and remind the user when items have been forgotten when they are leaving home. The Alert System is equipped with a touch-sensitive screen to provide five functions: event checking, follow-up consultation and pill taking reminder, blood pressure recording, video conferencing, and guiding. Lastly, the Door Locking System is an RFID-based access control system that only allows users with tags to enter.

The EHCMS was trialed at Jolly Place, an elderly care home managed by the Hong Kong Housing Society. This pilot project showed the system was able to improve safety by allowing care staff to monitor the elderly more closely and in real time. The elderly at the care home also found the system easy to use and rewarding. It allowed them to discover more about their community, join activities, and communicate more with family, friends and care staff.

Most Innovative EPC / RFID Application

Resources Management System for Robot Institute of Hong Kong (RIHK)

Student Chan Yun Chak, Leung Fai Yiu, Suen Hing Chuen, Tang Yue Tsun
Supervisor Ms. Elaine W.L. Cheng
Department of Information and Communications Technology
Hong Kong Institute of Vocational Education (Tsing Yi)

IVE

Robot Institute of Hong Kong (RIHK) was established in 2003 to provide a high quality academic robot technology learning program to Hong Kong primary and secondary education institutions. More than 18,000 primary and secondary students have attended the institute's courses since it was founded.

In the courses it offers, the institute provides students with robotics kits to assemble in order to gain practical experience with robotics. A packing list is generated for each course and then inventory is checked out according to the packing list using barcode scanning. When the course is over, the borrowed inventory is checked back in using barcode scanning. However, the packing and returning processes are largely manual, making them slow and prone to human error. Staff need to manually sort parts in each kit to make sure only the right parts are included.

To make this process more efficient and eliminate human error, the Hong Kong Institute of Vocational Education designed a resources management system for the RIHK, which leveraged RFID technology to automate checking in and checking out of inventory. The system, which was developed using VB.NET, allows staff to select a packing list then quickly check out the right inventory using an RFID reader. When inventory is checked back in, the reader can instantly alert staff if inventory has been lost or if the wrong inventory has been returned based on the packing list. In addition, the Hong Kong Institute of Vocational Education ensured the system was user friendly, with an intuitive user interface, tooltips and reminders. The system not only helped considerably speed up inventory management, but also allowed staff to cut down on paper usage.

RF-ICE: An RFID-based Intelligent Caring System for Improving Service Quality to Residents in Elderly Home

Students Lam Hoo Kwong Nathan, Tseung Ka Ling Lydia, Wong Kin Lok Kev
Supervisors Dr. George T.S. Ho, Dr. Jacky S.L. Ting
Department of Industrial and Systems Engineering
The Hong Kong Polytechnic University

Elderly care services in Hong Kong are facing serious challenges. As Hong Kong's population over the age of 65 years continues to grow, these challenges are growing year by year. On the one hand, the elderly care service industry is facing difficulties in attracting new talents. On the other, standards of professionalism in the industry have been called into question by frequent accidents, resulting from negligence and under staffing problems. These include administering the wrong medication to guests and failure to supervise guest activities in accident-prone areas, such as bathrooms.

The Department of Industrial and Systems Engineering at the Hong Kong Polytechnic University designed the RFID-based Intelligent Caring System for Elderly (RF-ICE) to address some of the problems it had identified with current elderly care services. Using RFID-tagged wristbands to identify guests, the system aimed to eliminate errors in medicine distribution and diet management, establish ubiquitous real-time location tracking to ensure guests can be easily located should they get lost or wander into restricted areas, and provide navigation services to guests via earphones.

The system was tested at the City Nursing Centre in North Point, an elderly care home with 56 beds that has been operating for more than 20 years. Using RF-ICE, the staff at the center gained quick access to crucial guest medical information, including dietary and medical records, all of which are stored on the system database. This, in turn, allowed the staff to work more effectively and efficiently, while cutting down on human error. Moreover, the system created a safer environment for guests by tracking their movements and alerting staff when guests entered restricted access areas or stayed in the bathroom for too long. Because of its modular design, RF-ICE can also extend its functionality, according to the needs of individual care homes in the future.

Smart Luggage System

Student Chan Sin Lun Thomas, Yu Yi Yan Ada
Supervisor Dr. Henry Chan
Department of Computing
The Hong Kong Polytechnic University

The Department of Computing at Hong Kong Polytechnic University designed the Luggage Identification system (LIS) with several objectives in mind, including enhancing security at airports, automating luggage identification and reducing staff resources needed to deal with lost luggage.

Using RFID tags generated and attached to boarding passes and baggage tags when passengers checked in, the system is able to identify passengers and their individual pieces of luggage. A fixed-point reader is installed at a custom checkpoint to verify whether each passenger is in possession of his or her luggage by matching the passenger's information against the customs database. By doing so, the system can prevent luggage from either being stolen or taken by mistake by another passenger. When there is an unauthorized removal of any luggage, an alert is sounded when the luggage passes the checkpoint. The system also enhances airport security by allowing airport staff to instantly identify who owns an unattended piece of luggage by scanning the RFID baggage tag. For cost-effectiveness, the RFID baggage tags can be re-used, as they carry a unique ID. One of the biggest challenges of the project was creating an algorithm for matching passengers and luggage, and designing the database to minimize the amount of information needed to be kept on the RFID tags.

In addition to enhancing the efficiency of the baggage reclaiming process and improving airport security, the system also fosters a greater sense of security for passengers, given that they know their baggage cannot be taken away without raising an alarm. Aside from the core functions, the system can also be extended to include other functions, including smartphone alerts for passengers should there be an authorized removal of their baggage.

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Co-organizers

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