



# IoT in Food Quality and Supply Chain

## RFID Application Service Technology in Guangdong-Hongkong Import/Export Supervision and Management 粵港進出口監管及管理的RFID應用服務技術

### Project Abstract

The joint collaboration between Guangdong and Hong Kong has become an indispensable driving force for economic and technological development in the PRD region. According to statistics, Guangdong's total foreign-trade volume weighs more than 350 Billion US dollars. Guangdong-Hong Kong's import/export trade valued at 250 Billion US dollars. Hong Kong direct investment in Guangdong exceeds 5 Billion US dollars, accounting for over 52.3 percent of the provincial actual foreign direct investment.

Aiming at strengthening the co-operation and supporting the growth for both Guangdong and Hong Kong, this project focuses on the supervision and management of imported/exported goods between the regions. Its goal is to develop and establish a cross-border goods supervision service platform to facilitate e-logistics, information exchange and supply chain applications between Guangdong and Hong Kong. The project also focuses on exploring RFID technology and related applications for the imported and exported goods between Hong Kong and Guangdong. It will introduce cross-border supervision and management applications, application standard research and pilot cases which are all based on RFID technology, cross-border information service platform, and other key enabling technologies.



In order to demonstrate RFID technology in the sectors, pilot study and typical enterprise applications for the monitoring of live pigs will be developed. The adoption of RFID technology will ensure safety and quality of commodities and enhance their tracking and traceability, particularly for food safety and animal epidemic prevention and control. In addition, through the application of RFID technology, it is expected that the project will strongly promote the rapid development of the RFID industry.

### 項目簡介

粵港合作成為雙方經濟發展不可或缺的動力。據統計，廣東進出口貿易總額超過3500億美元，其中粵港澳進出口貿易總值達2500億美元。港澳在廣東實際投資超過50億美元，佔全省實際吸收外商直接投資的52.3%。

在粵港合作的大前提下，本項目以粵港之間的進出口商品監管及管理為突破口，開發和建立出入境商品監管服務平臺，促進兩地物流的電子化、信息化發展，為粵港貨物跨境快速通檢，提供有效監管資訊。本項目集中探索RFID技術在粵港進出口商品監管及管理的應用，包括支援有關RFID技術應用標準的研究與實施、數據管理等關鍵技術。針對監管服務行業的關鍵問題、開發和建立基於電子標籤技術的監管應用。

本項目針對RFID技術在監管服務業的典型企業應用，包括活豬監控與追溯的RFID應用服務技術，研發相關技術及行業應用，將促進監管服務行業的資訊化水準，提高監管能力及效率，並降低監管成本。通過電子標籤技術建立貨品安全質量追溯方案和動物監管溯源追蹤方案，為各類貨品尤其是食物的安全和動物疫情防控、溯源追蹤提供一條資訊化途徑。本項目更會大力促進RFID相關產業快速發展。



RFID





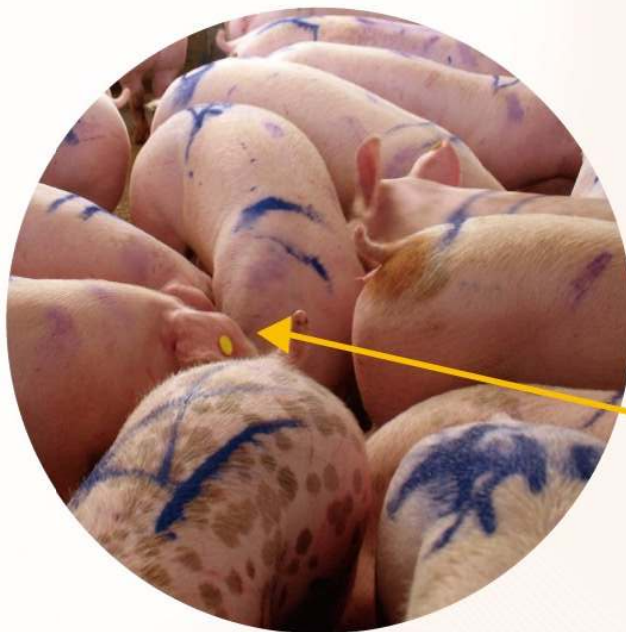
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## At the Farm 供港豬隻養殖場

### Source Tracking 源頭追蹤

To ensure all pigs shipped to Hong Kong are from approved registered farms, owners of farms staple uniquely-coded RFID ear-tags to their pigs to enable easy source identification electronically.

為確保每隻供港豬都是由註冊農場提供，在飼養期間，農場負責人會為每隻豬訂上有唯一編號的電子耳朵標。



RFID Ear Tag  
電子耳標

## Application Prospect 應用展望

With RFID ear-tags, pigs are given unique identities. Breeding records and medical records of pigs become easily accessible for inspection with the unique ID. At the same time, livestock buyers in Hong Kong can have information of the pigs being shipped in advance, which will help them improve the overall quality management capability. Moreover, if the parents' records are also recorded, transmission and spread of genetic disease can be prevented and food-supply quality is effectively enhanced.

基於電子耳標的唯一辨識性，就如身份般識別豬隻，用以審查有關豬隻的飼養記錄和病歷記錄，同時能提前通知香港收購商供港豬隻的質量。全面提升品質管理的範圍和深度。再者，如能記錄豬隻父母的資料，甚至可以預防遺傳疾病的傳承和散播，切實地提升供應食品的質素。

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## At the Distribution Center 豬肉分銷中心

### Six Parts 六分體

At the distribution center, each of the halves will be cut into three pieces resulting each pig be cut into six parts. During the cutting process, the staff will allocate the 3 UHF tags found in the body-hook to the 3 body parts to ensure that track-and-trace can be done independently with the body parts. The parts will then be placed into plastic transport baskets according to customer orders.

在分銷中心，半邊豬身將再切割為三份，即每隻豬將會被切割為六份(即六分體)。切割過程中，員工會將二分體勾上的三個UHF標籤分配給每件六分體，確保每件六分體都能做到獨立追蹤和溯源。然後再按客戶要求，將各分體分裝在專用運送膠籃中。



### Local Delivery Tracking 本地配送追蹤

Since the body parts have UHF RFID tags, when the plastic transport basket passes through the designated UHF gates, the system can read and record the relevant information simultaneously. So, if the meat processing plants and supermarkets have installed UHF gates, they can trace the farm source from every piece of pork parts to make sure they are supplied by approved registered pig-farms so as to reinforce consumer confidence in food safety.

由於六分體上用了可以同時讀取多個標籤的UHF技術，所以當運送膠籃通過指定的UHF閘門時，系統就可以讀取和記錄相關的標籤。只要在肉類加工場和超市安裝UHF閱讀閘門，就可以準確追蹤每份豬肉的源頭，確保由合資格的供港養殖場提供，提升消費者對食品安全的信心。



### Application Prospect 應用展望

Enterprises can integrate their ERP system with the Live Pig Platform to access delivery information to enhance or automate their delivery process, to improve the corporate management effectiveness. In addition, information like departure time of shipment, if provided to downstream buyers (e.g. supermarkets) in advance will allow them to schedule work and time more efficiently.

企業可以將內部的管理系統與活豬平台整合，獲取配送資料，將配送流程自動化和電子化，提升企業管理運效率。除此之外，如能讓下游採購商(如超市)提前獲知豬肉離開加工場的時間，從而更有效安排工作和時間。



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## At the Supermarket 超市零售點

### Pre-packing 預包裝

Food safety has always been a concern to consumers. They are keen to know the information of the food when they shop. If the use of RFID technology is extended to retail level, the retail price say for a pack of pork of about HK\$20 will be significantly increased.

一直以來消費者對食品安全都非常關注，希望在購買時可以取得相關資料。但如把RFID技術延伸到零售層面，以現時每包大約二十多元的豬肉產品來計算，將會引致相當幅度的成本上升。



### Binding with Bar-code 結合條碼技術

To address the issue, the project introduces the practice where RFID data is bound with bar codes through the integration of RFID and bar code technologies. The bar codes are then stamped on the food packs (like what is doing today) to realize track-and-trace of pork products at retail level without adding to the cost.

為解決上述問題，在預包過程中本項目將會引入條碼技術與RFID技術進行數據綁定，就像現時的包裝程序一樣，將相關的條碼標籤貼在包裝上，即能實現零售點每包豬肉產品的追蹤和溯源及維持原有的成本效益。



## Application Prospect 應用展望

In case of product recall, a comprehensive and precise return order can be quickly composed. Enterprises and respective authorities can then effectively execute the calling back of food products to minimize the damage to the community and safeguard the public health.

在食品回召時，可以快速提供精準的回召清單，讓企業和相關部門可以及時和有效地執行食品回召。將對市民的影響減到最低，保障公眾健康。