

공급 체인 관리 RFID 응용에 대한 연구

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요약 : 본 연구는 공급 체인 관리 및 물류 개발에 RFID 기술의 활성화 역할을 제공합니다. 또한, 연구 결과는 국제 물류의 RFID의 최근 응용 프로그램을 공개하고 협력 업체 간의 RFID 널리 채택 및 사용의 핵심 요소로 이유를 분석합니다.

핵심용어 : RFID, 기술, 물류, 응용, 공급 체인 관리

Contents

- What is RFID?
- Applications of RFID technology
- Issues And Implications
- RFID Trends and Expectation in Korea
- Conclusion and Future Research

- ### Characteristics of RFID
- 1 Recognize multiple cards simultaneously, and can be save time, recognized by high-speed.
 - 2 The sensing distance is long, depending on system characteristics and environmental conditions have a wide application area is easy to apply.
 - 3 Users in the card reader need to insert because there is no mechanical contact card damage due to friction, dust, moisture, temperature, snow, rain, and the error rate is very low even under adverse conditions.
 - 4 It can penetrate non-metallic materials. Glass, textiles, wood, because you can pass information through the card, leave the battery in your pocket or bag can be recognized.
 - 5 The radio waves emitted from an antenna or a leader because it is in the direction of information transfer has the advantage less affected.

Comparison between RFID and others

	Barcode	OCR (optical character recognition)	Magnetic card	IC Card (integrated circuit card)	RFID
Recognition Method	Non contact	Non contact	Contact	Contact	Non contact
Recognition Distance	~ 50cm	~ 1cm	-	-	~ 27m
Recognition speed	4 Sec	3 Sec	4 Sec	1 Sec	0.01~0.1 Sec
Penetration	Impossible				Possible (Except metal)
Contaminant	High	High	Exist	Exist	None
Recognition surface	Single surface	Single surface	Single surface	Single surface	All surface
Plural Recognition	Impossible				Possible
Save data	~100byte	~100byte	~100byte	16~64Kbyte	16~64Kbyte
Damage	High	High	High	High	Few
Expiration	-	-	Less than 10,000 (4 Years)	10,000 (5 Years)	100,000 (80 Years)
Counterfeit	Yes	Yes	Yes	Few	Few
Cost of tag	Very low	Low	Low	High(Over \$10)	Medium (~\$1)

Peculiarity of each RFID application parts

Category	Purpose and othercharacteristic
Industrial	Process Control: Real time data control of process and inferior. Final Marker, Employee, date, Order No, Lot No can be saved and can be used on AIS.
	SDM: Path of Materiel, information and cost from distributor to producer, detail shop, and customer can be observed and controlled. Easy to watch inventory for future.
	Security: Entrance security is providing for industry, apartment, membership club such as where needs access security. Employee watching, cafeteria, security for personal computer system can be providing.
Distribution	Shipping: The tag that attached on cargo can track the status for real time during the shipping.
	Storage Control: Receiving and departing of inventory can be monitored in real time, and authorized system increase effectiveness of process.
	Air Distribution: By adding information on RFID tag for cargo can track the pathway, monitored status, and more.
Public Property	Warehouse: Minimize the distribution process by keep track and controlling disply, theft prevention brings profit. Running store without employee is possible.
	Library: Keep the track on inventory, and minimize renting process.
	Parking Highway: Decrease delay by automatic ticketing system, it can prevent parking violation, and charging high way usage.
Ect	Transportation Fee: It can be attached to transportation card of credit card. It has been used on the bus and the subway. It can be apply to airline, ship, taxi and more.
	Electric Bill: Electric bill can satisfy safety, identify theft, user's privacy as basic function.
	Patient control: Easy to maintain patient. Patient's information as medical history can be maintained and saved easily and can be used well in the emergency and secured. Fast and convenience service can be provided. Can save the cost of medical care.
Agriculture	The number and types of crop can be kept in the data, and managed on real time.
Livestock	Livestock control can be efficient by making the date of animals info.

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Issue #1

Relative Lack of Awareness of the RFID

Relative lack of awareness of functions and efficiency unique to RFID

Recently some improvement to awareness and increase of market demand, but the changes remain insufficient.

RFID Application interest: 30.4% - 36.8%

Lack of large-scale RFID success story imposes much difficulty to introduction of RFID

Issue #2

RFID Tags has high tag.

Cost burden incurred by a relatively higher price of RFID tags than regular barcode tags

The RFID tag price has been going down by 1/10 from \$2 to 5 cents

Still too high for large-scale introduction, compared to bar-code

Issue #3

Need for the extra investment

Cost burden incurred by the establishment of new infrastructure

Introduction of the RFID system requires the replacement or adjustment of the existing barcode system, incurring additional cost burden.

High customizing cost for deployment because of the RFID technology's dependence on wireless frequency system. Interference between readers

Issue #4

Relative Lack of Market Confidence on RFID

•Need to improve the market confidence on RFID technology

- 900MHz-range RFID technology has yet to overcome its vulnerability to metal or liquid environment as well as speed of mobile entities to make application on the item label sector somewhat difficult.

- Related works should be promoted and supported by the government

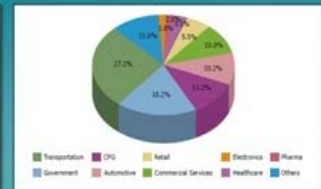
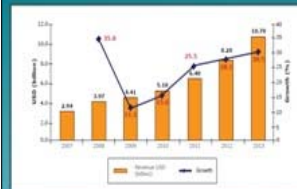
Forecast for Global sales of RFID tags

Number (billions)	2005	2010	2015
Individual Products	0.5	27.0	1,000.0
Pallet/case	0.4	30.0	35.0
Other	0.4	5.7	12.5
All categories total	1.5	62.7	1,047.5

The best prospects in RFID application services came from logistics and distribution sectors, at 57.1%, followed by security and transportation with 9.8% and 6.1% respectively. RFID market opportunities for U.S exporters should come from network development and equipment/service-related applications, as well as software solutions.

The key growth of RFID market demand tends to depend on the development of tag technology.

Global RFID Market Revenue 2007-2013 (USD billion)



Application Group Revenue	2009 (USD mil)	2014 (USD mil)	CAGR (2009-2014)
Traditional applications*	3,843.3	4,953.4	5.2%
Modernising applications	1,705.2	4,249.2	20.0%
Total	5,548.5	9,202.6	10.6%

*Includes access control, automobile immobilisation, AVI and ID documents
Source: "RFID—Key Considerations and Opportunities for Modernising Marketplace", ABI Research Webcast, May 2009

RFID is a key enabler of Supply Chain Operations

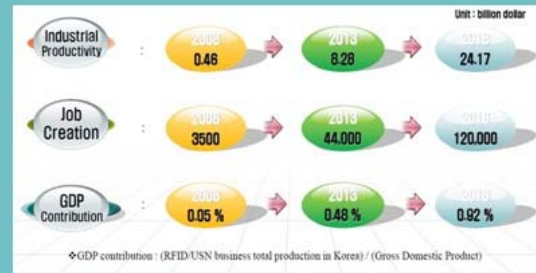
Current research and applications of RFID in practice

- Implementation challenges, identity-based tracking and web services for small- and medium-sized enterprises
- The integration of RFID and connective technologies in retail stores
- RFID based system for real-time fruit management
- Application of RFID and sensing technology for improving frozen food quality management
- RFID for customer relationship management
- The use of RFID technology for the improvement of unloading processes.

Logistic standards and emerging issues such as privacy and security considerations for RFID systems, legal and ethical issues concerning or the role of consumer education in the future of this technology.

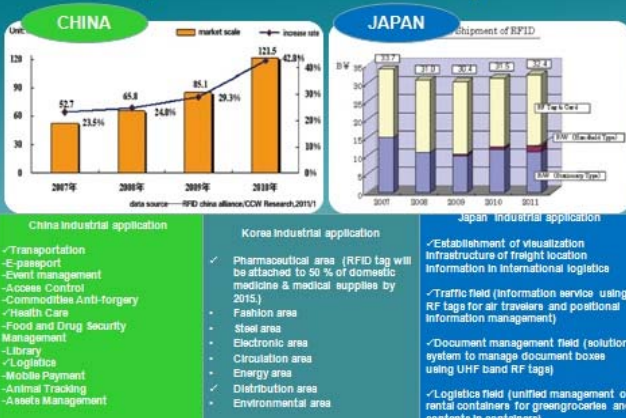


Economic Expectation



In 2018
 25 billion \$ total production in RFID/USN
 More than 120,000 employment creation
 0.92% level of contribution at GDP

Comparison of RFID development



Conclusion and Future Research Topic

- RFID is key enabler of SCM
- Doubt on the efficiency & importance
- Lack of success stories
- High Tag of RFID tag

The RFID industry is emerging from its transition stage as businesses are ramping up their use of RFID technology. It is expected that this profitable sector will attract more investors looking for opportunities on the horizon.

