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Best Practice Action

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Market Analysis

INTRODUCTION

As the market for RFID matures, RFID suppliers are optimistic concerning the industry´s future and have great confidence that their products and services can solve problems across different markets. At present, there is no known monopoly on RFID innovation. Some of the largest and smallest RFID vendors are making significant technological innovations to support current, emerging, and future applications. However, many vendors agree that the overall growth and adoption of RFID will be uneven across different markets. Suppliers also indicate that while the industry has grown over the last three years, much of the growth came from traditional, established applications. RFID manufacturers have proven that the technology can work in many applications and end users have a better (yet incomplete) understanding of how RFID technology can benefit them.

In general, one can say that the RFID technique requires extra costs for the electronic tagging (it is more expensive than the bar-code) of each individual object. The main economic benefits come from rationalisation on the system level where advanced object tracing and control leads to high degree of automation.

In order to make the introduction of an RFID system profitable, the overall challenge in developing technologies for RFID is to achieve tags with high-performance at a low cost. A low-cost tag has to be passive (without its own power supply), which makes the technological challenges even more pronounced. Moreover, since the tags have to operate and perform well in different kinds of environments, design and optimisation to achieve robustness are of greatest importance.

When looking ahead, the distribution network must prove its ability to sell and implement complete solutions (RFID hardware, software and integration/support services). Improved return on investment and cost justification models need to be build to comfort end users and clearly define the value of an RFID system implementation. Also, work on standards for specific industries and applications, greater interoperability among products from various manufacturers, and other technical/operational concerns will continue laboriously. Undoubtely the RFID market will grow and RFID will make further progress in the next five years..

GLOBAL MARKETS FOR RFID SYSTEMS

The total global market for RFID systems has grown to nearly $900 million in supplier revenue in 2000 (see Table 1). While the market is growing annually, more rapid expansion has been limited by the lack of industry and application standards, the approaching saturation points of well established, traditional RFID applications (i.e., security/access control and transportation), the weakness of indirect channel support, and the highly fragmented competitive environment. In response, vendors have been working diligently to quickly resolve these issues through revamped partner programs, expanded products lines, standards initiatives, and new application developments.

Although mired by these and other factors, such as price and return-on-investment(ROI) concerns, end-user demand for RFID systems has increased. The most significant RFID development in 2000 was the number of organizations who really began using it. Besides the usual high numbers of trial applications, there were many real implementations across several industries. End-user acceptance of RFID was especially evident in several industries. For example, numerous libraries, labs, hospitals, commercial laundries, and automobil manufacturers implemented RFID for item or material management. This penetration into vertical industries occurred as a growing number of system integrators and software companies who serve these industries began to form relationships with RFID vendors. RFID hardware manufacturers also began to welcome solution providers who specialize in warehouse management, logistic services, asset management, and industrial automation into their partner programs.

Over the next five years, greater end-user awareness of RFID technology and its benefits will foster wider adoption and increase demand particulary in high volume market segments, While the market may not be prepared for explosive growth, it has established itself within enough market segments and applications to sustain a 24% annual growth rate. This is actually a rate higher than any other automatic identification technology.

If the cost of RFID tags could equal the cost of printed bar codes, many new application segments of RFID could be conceived. In the future, electronic circuits hold in perspective to be manufactured out of conducting polymers utilising ordinary printing techniques. When this technology matures it will give us the option of using RFID in any application, with tag cost being of no practical concern. This is especially interesting for paper based products while they are often used in low cost applications.

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**CAGR**
Transponders	$456.8	$667.5	$835.3	$1,051.9	$1,270.7	$1,513.4	27.1%
Readers	$206.5	$244.9	$294.3	$436.7	$436.7	$525.5	20.5%
Software	$44.6	$56.0	$70.0	$112.7	$112.7	$144.4	26.5%
Services	$190.0	$224.2	$264.9	$382.7	$382.7	$463.4	19.5%
TOTAL	$897.9	$1,187.6	$1,464.5	$1,812.7	$2,202.9	$2,646.7	24.1%

Table 1
Global shipments of RFID Systems Segmented by Product Category
(In Million Dollars)

REGIONAL MARKETS FOR RFID SYSTEMS

Regional analysis of RFID systems revenue indicates that the American region had revenues of $427 million, approximately 48% of the global market (see Table 2).
Europe-Middle East-Africa (EMEA) netted 35% and Asia-Pacific (AP) pulled in 17% of the market. It has been noted that the rate of the adoption and level of user acceptance in Europé is more advanced than the rate of adoption and that the level of user acceptance in Europe is more advanced than in America or A-P, yet data reflects that EMEA does not hold the largest market share of RFID revenues. The America´s 48% market share primarily stems from the following conditions:

Americas account for a majority of the global service revenue (66%), adding over $ 125 million to the region´s RFID system markets share. A large percentage of these revenues are divided by traffic management system providers, such as Transcore, Inc., who hold on-going srevice and maintenance contracts with many state and national goverments which implemented RFID toll collection systems.

Annual growth in the A-P marketplace is expected to be greatest largely due to the small base of the RFID systems installations. The primary driver for A-P´s growth will be the expansion of several suppliers into this region. In efforts to reach potential A-P end users,suppliers have been building partnerships with other suppliers and revamping their distribution channels to include experienced RFID system integrators able to service customers in this segment of the globe.

	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**CAGR**
Americas	$426.6	$537.0	$648.9	$806.3	$983.3	$1,170.7	22.4%
EMEA	$310.7	$422.3	$519.2	$633.7	$750.6	$879.9	23.1%
A-P	$160.6	$228.3	$296.2	$372.5	$469.2	$596.1	30.0%
TOTAL	$897.9	$1,187.6	$1,464.5	$1,812.7	$2,202.9	$2,646.7	24.1%

Table 2
Shipments of RFID Systems Segmented by Regional Market
(In Million Dollars)

ECONOMIC SECTORS

In 2000, RFID hardware shipment revenues were concentrated among industrial/manufacturing and transportation, distribution and warehousing organizations. While these two economic sectors will account for the largest percentage of RFID hardware revenues in the near and long term, their annual growth will be slower in comparision to the growth of the health care, commercial and retail service sectors.

Top Three Fastest Growing RFID Economic Sectors
(In descending order)

1 **Retail services**
2 **Commercial services**
3 **Health care services**

APPLICATIONS

There is a wide range of applications for RFID. In intelligent logistic systems even small objects can be electronically tagged to make it possible to trace and control them during their entire life cycle (i.e. production, distribution, selling, and recycling). One application example where this technique can be used is in grocery stores. The packages are tagged and all items in the trolley are registered simultaneously when passing a scanner unit.

The RFID technology is, at present, in an emergent stage. Two examples of today’s RFID systems are theft protection systems in shops and systems for remote road toll management. Both systems consists of electronic “tags” attached to either expensive items in a shop or to a car dashboard. The systems also requires remote readers to collect information from the tags through inductive or capacitive coupling. A constraint for broader usage of RFID today is the relatively high cost of the RF-tags.

Since its introduction into the market, RFID technology has not found a ”killer” application per se. Vendors and end users have been waiting for a ”killer” application to emerge to establish RFID as a viable, mature automatic identification application solution. However, one could argue that automobile immobilization and transportation likely represent ”killer” applications. Regardless, the benefits of RFID are beeing realized across a mulitiude of applications and industries – and the trend is likely to continue as adoption increases and new applications emerge.

While the potential for viable RFID applications appears virtually limitless, few applications have translated in consistent and profitable opportunities, with price often beeing the decisive barrier. Of the current applications, arguably the most mature and developed systems include security/access control, various transportation application such as a rail car tagging, asset management, and electronic toll collection.

In 2000 security/access control applications dominated the RFID market in terms of hardware revenue across all three regions. Overall, security/access control and transportations represent the most widely adopted applications in the RFID industry. By 2005, supply chain management applications will join these applications in holding the lion´s share of market revenues.

Top Five Fastest Growing RFID Application Segments
(In descending order)

1 Point of sale
2 Rental item tracking
3 Baggage handling
4 Real-time location systems
5 Supply chain management

GLOBAL MARKETS FOR RFID TRANSPONDER ICS

Overall the global RFID transponder IC market reached $76.3 million in 2000, representing approximately 17% of the total finished transponder market (see Table 3). This figure represents only the IC market and does not include antennas and packaging. The market forecast for RFID ICs is estimated to grow by 34% compounded annually in terms of supplier revenues. In comparison to finished transponders , RFID transponder IC revenues are expected to grow at a faster rate due primarily to the anticipated shift in the mix of transponders shipped (in terms of frequency and functionality/performance supported). Although transponder costs are expected to decrease dramatically, the IC is expected to account for a greater percentage of the total cost. This is primarily a factor of the shift away from low frequency transponders which require a more costly antenna process to high frequency, UHF and microwave solutions.

Region	**2000**
Americas	$25.0
EMEA	$40.6
A-P	$10.7
TOTAL	$76.3

Table 3
Global shipments of RFID Transponder ICs Segmented by Regional Market
(In Million Dollars)

REGIONAL MARKETS FOR RFID TRANSPONDER ICS

Shipments of RFID ICs by regional market differ significantly from those of finished transponders(refer to Table 3). While several A-P based semiconductor contract manufacturers support RFID IC production, the majority of IC fabrication is conducted in Europe and North America. However A-P based foundries are expected to account for a rapidly increasing percentage of RFID IC volume as outscourcing becomed an increasingly viable option in manufacturing process. Today IC shipments remain highly regional, with the vast majority of shipments to local or regional OEM partners.