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LSCM MARKET INTELLIGENCE REPORT

A Market Intelligence Study on Enabling Technologies for
Industries related to Logistics & Supply Chain Management



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



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BACKGROUND

INTRODUCTION

Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies (LSCM R&D Centre) is established with funding support from the Innovation and Technology Commission of the HKSAR Government and is commissioned to provide a one-stop shop for technology transfer and commercialization through the following roles:

- Conduct industry-oriented research
- Provide technology and market intelligence
- Provide a platform for exchange of intellectual property/technology
- Promote technology development, transfer and knowledge dissemination
- Facilitate intellectual property commercialization

Since inception, the LSCM R&D Centre was given the mission to foster the development of core competencies in applied R&D in logistics and supply chain related technologies and facilitate adoption of these technologies by industries in Hong Kong and mainland China. Our long-term goal is to strengthen Hong Kong's economic competitiveness and maintain its position as a world-class leading logistics hub in the PRD region.

This Project, titled "**A Market Intelligence Study on Enabling Technologies for Industries related to Logistics & Supply Chain Management**" is to empower the logistics and supply chain community in Hong Kong and PRD region with market and technology intelligence for industry users to locate and adopt new technologies, for technology vendors to identify market needs so as to develop relevant applications and for R&D parties to gain inspiration from global technology landscape and to identify prevailing technology gaps for further R&D.

This Publication, namely "LSCM Market Intelligence Report (Issue 1) – August 2008" is a start-up deliverable to share findings from on-site company visit exercise focusing on manufacturing sector plus an overview of policy of China's RFID industry development. In forthcoming issues, the Project Team will study more industries and stay connected with stakeholders along the supply chain (a total of 400 companies are in the visiting plan). In addition to the latest development of China's national RFID standard, supplement to technology adoption and application in China will also be published in subsequent issues.



BACKGROUND

PROJECT TEAM

It has been our mission to provide market intelligence and we place emphasis on enabling technologies which are essential for us to carry on our commitment and dedication to technology development. To support the study, the Project Team has pulled in expertise from the LSCM R&D Centre as well as professionals from the industry in Hong Kong and mainland China to take a combination of approaches to gather industry problems, technology needs and technology development gaps in Hong Kong and PRD while keeping a close watch on technologies, policies and standards developments in China.

To gather extensive market intelligence from logistics and supply chain community in Hong Kong and PRD, the Project Team is proud to partnering with the **Hong Kong Productivity Council and Research Center for Modern Logistics Technology and Management of Lingnan (University) College, Sun Yat-Sen University** to carry out the collaborative work in the region. They are experienced in conducting surveys and have good industry network to support our broad-based market study.

Hong Kong Productivity Council

Hong Kong Productivity Council (HKPC) is a public body established by legislation of HK with 40 years of history in serving manufacturing and related servicing industry. The mission of HKPC is to help HK enterprises to improve productivity and enhance value along the value chain in terms of consultancy service, training, technology transfer and other programs.

Role in the Project

- Advise on research methodology
- Carry out in-depth interviews with enterprises in Hong Kong
- Liaise with local industries and promote project results

Research Center for Modern Logistics Technology and Management Lingnan (University) College, Sun Yat-Sen University

Founded in July 2002, Research Center for Modern Logistics Technology and Management is a leading research institute of Sun Yat-sen University. The mission of the Center is to foster excellence in cutting-edge logistics research, education and industrial collaboration in order to promote the development of modern logistics in China.

The Center is committed to research, education and industrial collaboration of various aspects of logistics management. Logistics problems among the research domains of the Center include logistics system analysis and design, regional logistics strategy and planning, organizational logistics system design and optimization, distribution center design, transportation management and routing optimization, organizational supply chain management and management information systems in logistics and supply chain.

Role in the Project

- Carry out in-depth interviews with enterprises in PRD
- Liaise with industries in PRD and promote project results

On the China Watch part, the Project Team has partnered with **RFID China Alliance** to have a close watch on the new developments in China. It has an extensive network that the project team members can leverage in gathering information about technology adoption, policy changes and development of national RFID standard in China.



BACKGROUND

PROJECT TEAM

RFID China Alliance

RFID China Alliance is the only non-profit industrial association on RFID in China. The Alliance, comprised of RFID chip, label, middleware, reader and printer solution providers, was founded on Nov 5, 2005, under the leadership of the Ministry of Information Industry (MII) of the People's Republic of China. Its core responsibility is to promote RFID's industrial development in China and provide up-to-date information on RFID Chinese governmental policy, latest technological developments while holding an open attitude on RFID standards and protocol.

Role in the Project

- Closely monitor the policy and standard developments in China
- Provide regular update on RFID adoption and application among industries in China

The following are core members of the Project:

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ACKNOWLEDGEMENTS

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We own special thanks to the following companies, which participated in in-depth interviews to share invaluable opinions with us. They helped project team members in understanding the industry needs and technology capabilities of manufacturing operations in mainland China and Hong Kong.

APEX Manufacturing Co. Ltd.
China Union (Cashmere) Int'l Group Ltd.
Hirose TH (HK) Co., Ltd.
Keeman Garment Ltd.
Long River Computer Label Development Co., Ltd.
Modern Metal & Refining Ltd.
Nypro Tool Hong Kong Ltd.
Parada Co., Ltd.
PCT Industries Ltd.
Rose Knitting (Asia) Ltd.
SmartLite Manufacturing Ltd.
Victory Concept Industries Ltd.



BACKGROUND

ACKNOWLEDGEMENTS

We would like to express our appreciation to the following industry support organizations, which helped us to promote the project activities and related results by all means.

Federation of Hong Kong Industries - Transport and Logistics Services Council
GS1 Hong Kong
Guangdong and Hong Kong Feeder Association Limited
Guangdong RFID Technology Service Center
Hong Kong Association of Freight Forwarding And Logistics Ltd
Hong Kong CFS and Logistics Association Ltd.
Hong Kong Logistics Association
Hong Kong Productivity Council
Hong Kong Science & Technology Parks Corporation
Hong Kong Shippers' Council

Gratitude to the collaborating organizations and many research consultants from these organizations who, over the months, have played such an important role in this project:

Hong Kong – Hong Kong Productivity Council
Dr. Lawrence Cheung
PRD – Lingnan(University)College, Sun Yat-Sen University
Prof. Chen Gongyu Dr. Zhang Hongbin
China – RFID China Alliance
Madam Zhang Qi Mr. David Ouyang

During the course of liaison with collaborating parties in China and PRD, every effort has been made by **Mr. William Chan**, Co-Investigator of this project to contact all the stakeholders. His support and assistance has made it possible for us to present the results of China Watch, which was published in this issue.

We are also grateful to **Dr. Benjamin Yen** from School of Business of the University of Hong Kong for his research work in the theory and practice of strategy position map. He lent an invisible hand in this publication by offering a wealth of insights and perspectives, as well as the encouragement to undertake the project.

Last, and most important, thanks to the colleagues of the LSCM R&D Centre-specifically Management Team, Industry and Technology Programs Team, Administration Team and PR & Corporate Communication Team for their dedication and unfailing support to this project.



FOREWORD



FOREWORD

Development of core competencies in applied R&D and facilitating technology adoptions by industries are the core tenets of our mission at the Hong Kong R&D Centre for Logistics and Supply Chain Management Enabling Technologies (LSCM R&D Centre). These core tenets often overlap as our staff, researchers, academic and industry partners work together to seek innovations and solutions to some of the challenges faced by the logistics and supply chain management industry sectors in the region. The market research conducted here at LSCM R&D Centre comprises extensive industry surveys, on-site company interviews, policies and standards coverage in China and international frontier as well as in-depth market studies of important and contemporary topics. This market research project is a reflection of that work and of LSCM R&D Centre's mission to provide technology and market intelligence with genuine impact.

The project deliverables are a compendium of the work conducted by industry surveyor, China and International experts in policies and standards, academic and applied researchers as well as industry specialists. Many of these works would empower the logistics and supply chain community, including industry users, technology providers and R&D parties, in Hong Kong and Pearl River Delta in the production and adoption of relevant technologies with an aim to enhance competitiveness of the logistics and supply chain industry. It would facilitate LSCM R&D Centre in refining the technology roadmap and in defining the long term R&D trend with market intelligence gathered from logistics and supply chain industry, technology vendors and R&D parties. It would monitor the development of new technologies, policies and standards in the world with emphasis on mainland China and Hong Kong.

The public challenges facing the world are increasingly complex and interrelated. Solutions require creative, rigorous and pragmatic research. LSCM R&D Centre will continue to develop innovative and powerful ideas to help combat these pressing issues in order to effect meaningful and positive changes. This vitally important work is increasingly the result of collaborative efforts involving researchers from across several disciplines and companies from different sectors. Besides, the outcomes can often be transformative.

The Market Intelligence Study on Enabling Technologies for Industries related to Logistics & Supply Chain Management we are undertaking reflects LSCM R&D Centre's continuing commitment to provide a one-stop shop for technology transfer and commercialization as well as our collective vision to be a world renowned leading centre of Excellence in Logistics and Supply Chain Management research and development. I am proud to share this resource with you.

Peter Li
Project Coordinator and Principal Investigator
Director, Research and Technology Development
LSCM R&D Centre

EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

Empowering the logistics and supply chain community in Hong Kong and PRD with market and technology intelligence is a priority for the LSCM R&D Centre. **LSCM Market Intelligence Report**, a study on enabling technologies for industries related to Logistics and Supply Chain Management offers industry players with analytical results from in-depth interviews in which they can find cause for both requirement and concern from local industries. On the other hand, the comprehensive view on policy of China RFID industry development provides RFID vendors a substantial value behind the rapidly growing opportunities.

In the increasingly globalized economy, manufacturers in Hong Kong and mainland China have been facing severe business environment including escalating cost, changing of international standards, fierce competition, etc. Improving its supply chain management is one of the ways to cope with the stiff environment. To understand the needs in the marketplace, an on-site company visit exercise carried out by project team to gather complete and accurate information from manufacturers for analysis and reporting was of great worth. The findings presented in the "**Broad Coverage**" section covered analysis on participants' current I.T. applications status and satisfaction level, I.T. applications barriers and concerns, R&D demand and aspiration as well as adoption of RFID in addition to views on how industry trends would affect their technology applications needs in the future.

In **section 4.2 of Broad Coverage**, the majority of the participants agreed the significance of enhancing information technology capabilities. While 96% participants agreed that technology can improve operational efficiency; 92% participants agreed technology can improve data quality; whereas 78% believed technology can reduce human error (*Details refer to Table 4.2*). However, only 8% of the participants described their current I.T. applications as competent as "Full I.T. implementation with integration with both internal and external systems" (*Details refer to Table 3.2*).

In **section 4.1 of Broad Coverage**, we have examined the possible I.T. applications barriers and concerns perceived by the participants. It was found that the most important barriers for Hong Kong participants are Low User Recognition (80%), Shortage of I.T. People (75%), Lack of Government Support (75%) and Limited Budget (71%); whereas for the mainland China participants, the primary perceived barriers laid more on technical aspects including Complexity of Application Software (100%) and Data Integration (63%) (*Details refer to Table 4.1b*).



EXECUTIVE SUMMARY

In **section 3.4 of Broad Coverage**, we have further gathered the opinions on RFID application from 16 participants successfully. Among the 16 participants who have given opinions, 6 participants (38%) commented that they were hesitant to adopt RFID because of Cost Factor; 2 participants (13%) found RFID could not fit in their typical business operation. Despite the currently low usage level, 5 out of 16 participants (31%) stated that they will consider RFID in the near future (*Details refer to Table 3.4*). Despite the cost factor, the encouraging response showed the great industrial demand on RFID application.

The global RFID market continues its rapid growth and many agree that China will become the largest market for RFID. A review of the development of China's information industry in 2007 prompted that China's information industry maintained a steady growth in 2007, realizing a total business volume of RMB2 trillion, representing a rise of 25.6% compared to 2006. The Chinese government sees the application of RFID as an integral part to informatization construction and has spent tremendous effort in driving the application and development of the RFID industry. This has also become an important measure to the realization of its informatization strategy and industry development policy (*Details refer to Section 1, 2 and 3 of Global/China Watch*). The article published in the "**Global/China Watch**" section has also elaborated the efforts and directions that the Chinese government would pursue on RFID technology development. As mentioned in the "*White Paper on China's RFID Technology and Policy*", the overall targets of the development of RFID technology in China as: providing solutions with technology, breaking through a series of RFID common key technologies, industry key technologies and application key technologies (*Details refer to Section 4 of Global/China Watch*).

It is undoubtedly true that China is catching up in RFID development and market capacity. To be able to build and promote a RFID industry base with its own innovative strength, China would need to focus on enterprises and adopt an autonomous development model based on policy, production, learning, research and application aspects as indicated by the Ministry of Science and Technology in the contents of the Key and Special Projects of the National High-tech R&D Program (863 Program) in the 11th 5-Year Plan. Afterwards, a list of RFID technologies for different industries and areas was being put in the priority in the development of the New & High-tech Industry as stipulated by the "Three-Ministry & One-Bureau" in January 2007. The development of high speed and low cost tag packaging equipment, RFID and mobile communication and public information service system are a few examples out of the list (*Details refer to Section 5&6 of Global/China Watch*).

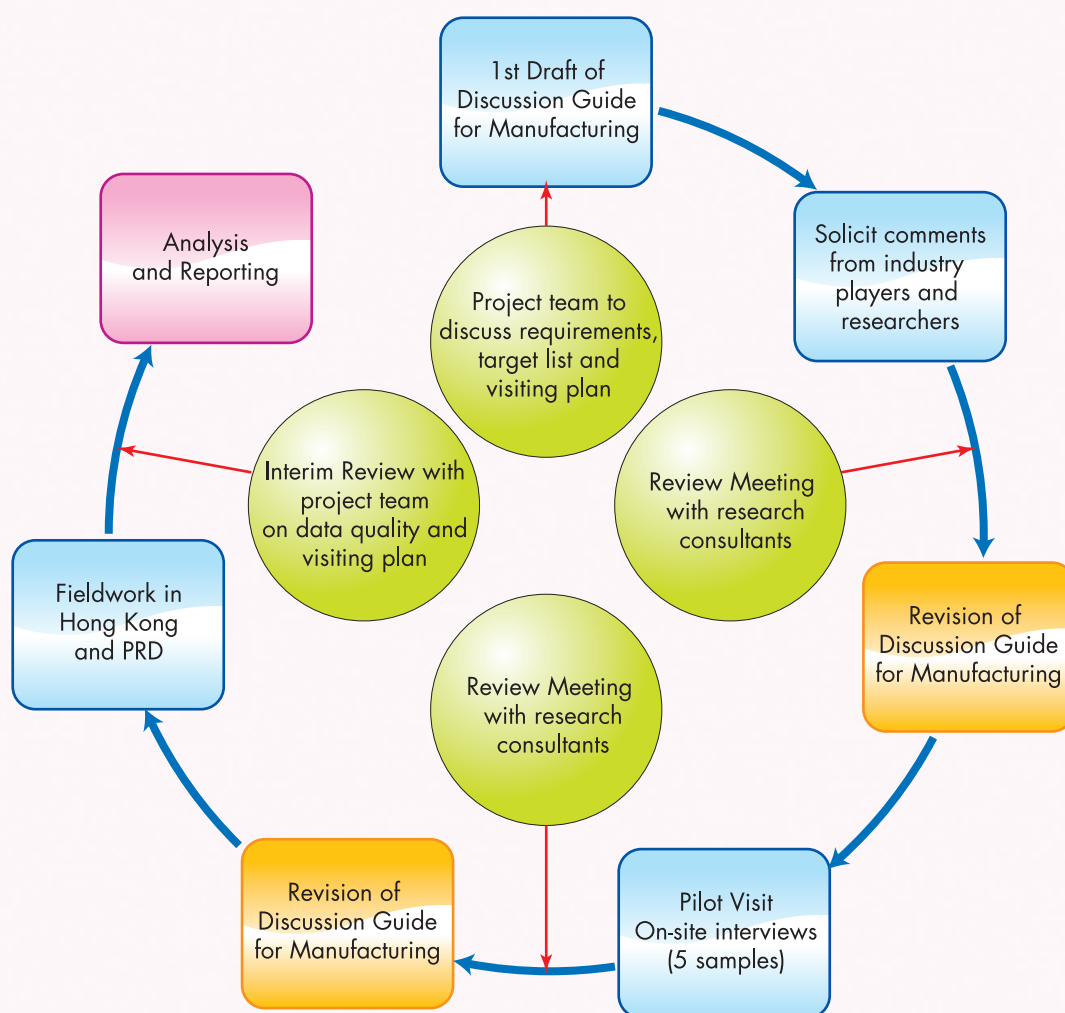


BROAD COVERAGE



BROAD COVERAGE

The essential details presented in this section are based on information collected from 25 manufacturing companies with a breakdown of 15 from Hong Kong and 10 from mainland China respectively. All interviews were carried out by research consultants between May and July this year, the average duration per interview took approximately 1.5 to 2 hours. For each company, the research consultant is required to probe opinions and stimulate discussion surrounding the company's demand and aspiration to new technologies, user requirement specifications, adoption and barriers to new technologies, logistics and supply chain product knowledge, industry issues as well as how government policies will affect industry operations. To maintain consistency of interview approach, a suite of industry focused discussion guide was in use (Appendix A) and the following diagram outlines the methodology of the study.





BROAD COVERAGE

PROFILE OF PARTICIPANTS

1. Profile of Participants

1.1 Profile of Participants by Business Nature

Among the 25 participants, they engaged in different industries which were summarized in the following table. Garment industry accounted for 32% (8 out of 25) of the total participants whereas electronics industry ranked next which accounted for 16% of the total response (4 out of 25).

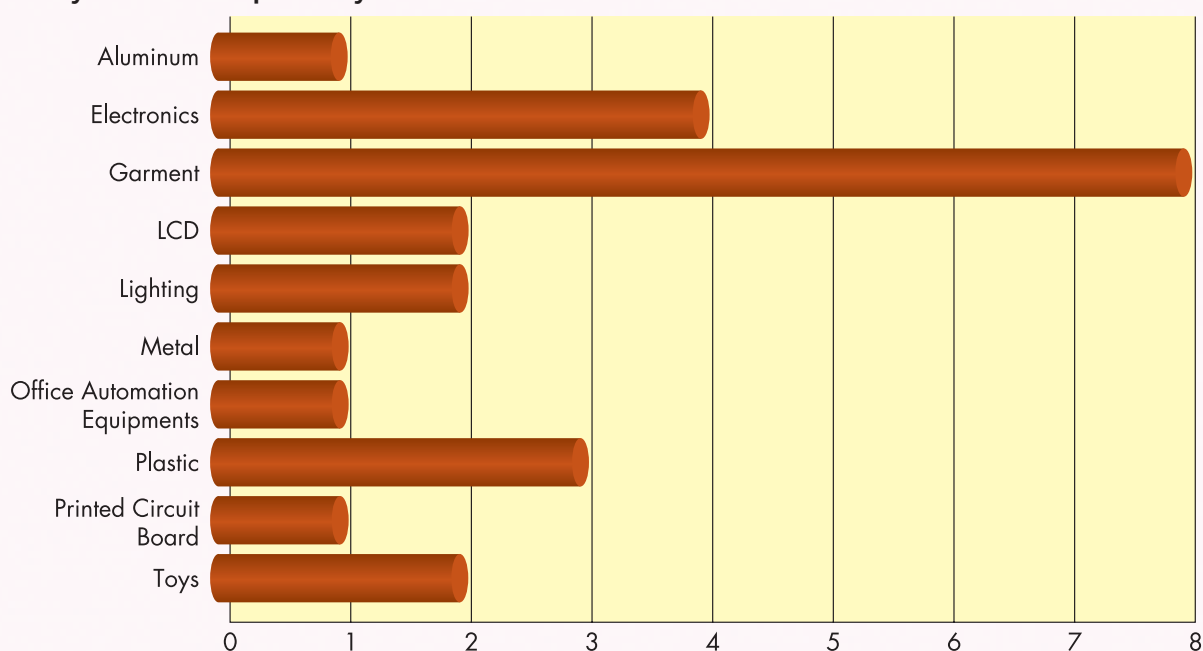
1.1 Table

Analysis of Participants by Business Nature

Business Nature	Number	%
Aluminum	1	4%
Electronics	4	16%
Garment	8	32%
LCD	2	8%
Lighting	2	8%
Metal	1	4%
Office Automation Equipments	1	4%
Plastic	3	12%
Printed Circuit Board	1	4%
Toys	2	8%
Total	25	100%

1.1 Chart

Analysis of Participants by Business Nature





BROAD COVERAGE

PROFILE OF PARTICIPANTS

1.2 Profile of Participants by Employee Size

Among the 25 participating companies, 9 of them (36%) employed less than 1,000 staffs whereas 4 companies (16%) employed over 10,000 staff. For these four companies, 2 were Hong Kong based (a toy manufacturer with staff 60,020 and a garment manufacturer with staff 30,020) whereas 2 were China based (a garment manufacturer with staff 25,500 and a electronic manufacturer with staff 17,000).

1.2 Table

Analysis by Number of Staff

Number of Staff	Number	%
1-1,000	9	36%
1001-2,000	6	24%
2,001-3,000	3	12%
3,001-10,000	3	12%
10,001>	4	16%
Total	25	100%

1.3 Profile of Participants by Job Title

20 out of 25 participants (80%) were graded Manager to Director. Only 5 were below manager grade.

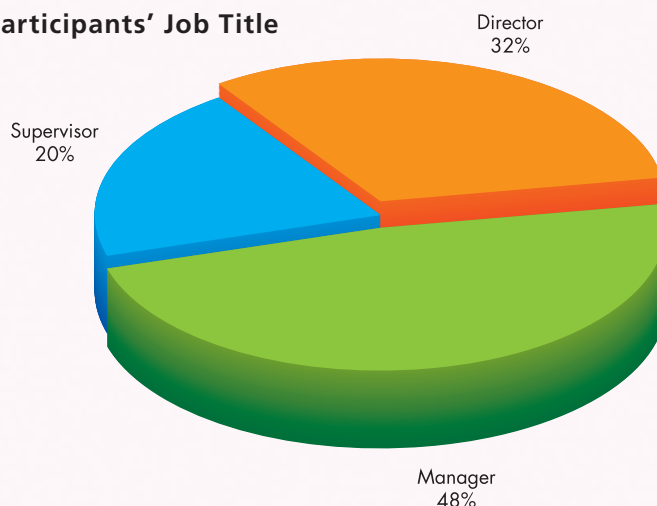
1.3 Table

Analysis by Participants' Job Title

Job Title	# of Participants	%
Director	8	32%
Manager	12	48%
Supervisor	5	20%
Total	25	100%

1.3 Chart

Analysis by Participants' Job Title





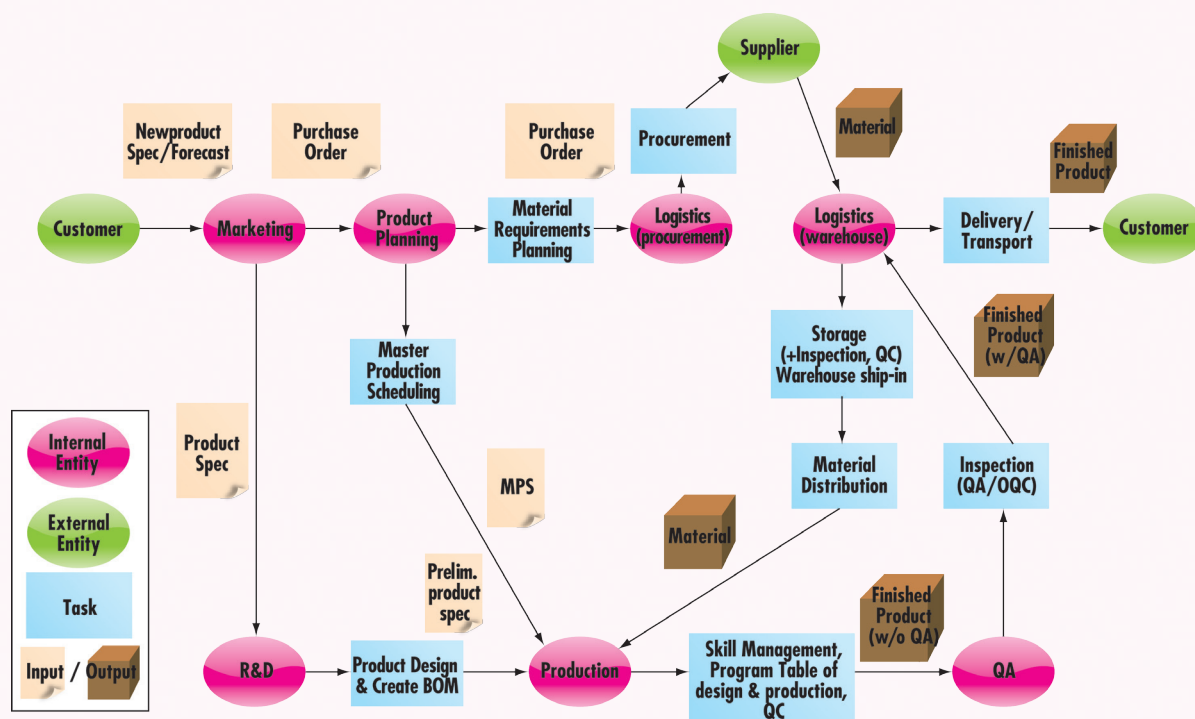
BROAD COVERAGE FINDINGS

2. Business Process

In this section, participants explained their business operation to identify information flow and required technology needs. Even different manufacturers engaged in different manufacturing businesses, they compared their generic work flow with the following diagram.

2 Diagram

General workflow diagram of manufacturing sector



There were 15 participants provided information on their most time consuming process and most costly process in their operations. It was interesting to note that 7 out of 15 (47%) indicated that procurement of raw materials was the most time consuming process and also the most costly process.

2(a) Table

Most Time Consuming Process

Most Time Consuming Process	# of Participants	%
Procurement of Raw Materials	7	47%
Production	5	33%
Others (Marketing, Design, Transportation)	3	20%
Total	15	100%

2(b) Table

Most Costly Process

Most Costly Process	# of Participants	%
Procurement of Raw Materials	7	47%
Production	4	27%
Others New Product Development, R&D, Transportation)	4	27%
Total	15	100%



BROAD COVERAGE

FINDINGS

3 Analysis by Current I.T. Applications

In this section, participants' current I.T. applications and their level of usage were examined.

3.1 Analysis on Current I.T. Applications

A total of 25 participants provided information on their current I.T. applications and the replies were summarized in the following table. Among the various applications, ACC, ERP, WMS and Bar Code systems were the most popular applications adopted by participants which over 50% participants were currently using. While less than 20% of the total participants were using FMS, PDA, RFID, PMC, BI, GPS.

The following technologies were adopted by companies in Mainland but not in Hong Kong.

- Global Positioning System (GPS)
- Business Intelligence (BI)
- Personal Digital Assistant (PDA)
- Freight Management System (FMS)
- Wi-Fi
- SIM

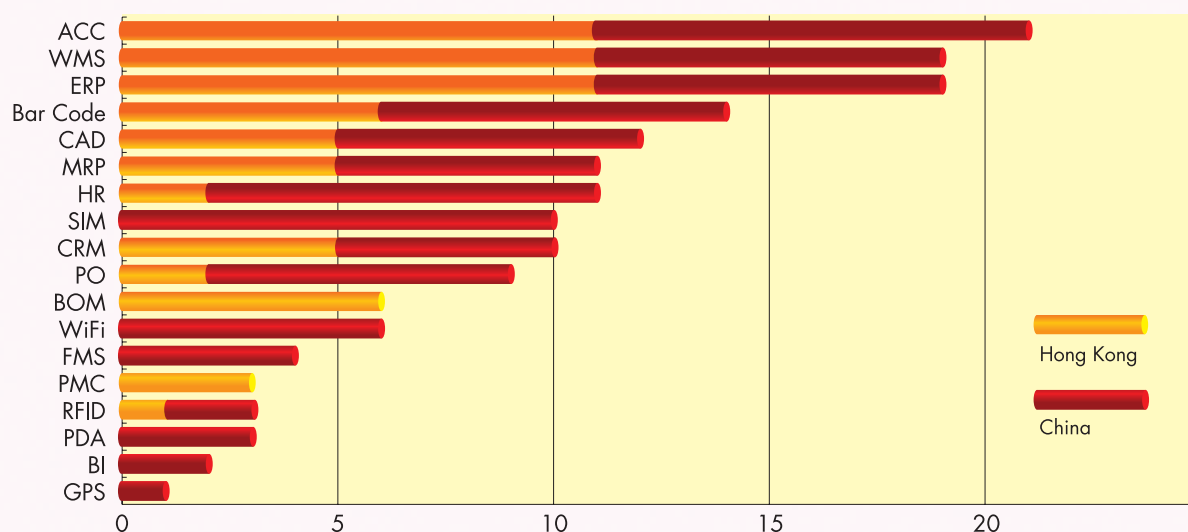
3.1 Table

Current I.T. Applications

Applications	# of Participants	%
ACC	21	84%
ERP	19	76%
WMS	19	76%
Bar Code	14	56%
CAD	12	48%
HR	11	44%
MRP	11	44%
CRM	10	40%
SIM	10	40%
PO	9	36%
WIFI	6	24%
BOM	6	24%
FMS	4	16%
PDA	3	12%
RFID	3	12%
PMC	3	12%
BI	2	8%
GPS	1	4%

3.1 Chart

Current I.T. Applications



	GPS	BI	PDA	RFID	PMC	FMS	WiFi	BOM	PO	CRM	SIM	HR	MFP	CAD	Bar Code	WMS	ERP	ACC
China	1	2	3	2	0	4	6	0	7	5	10	9	6	7	8	8	8	10
Hong Kong	0	0	0	1	3	0	0	6	2	5	0	2	5	5	6	11	11	11



BROAD COVERAGE

FINDINGS

3.2 Analysis by Current I.T. Application Status

In this section, participants were asked to select the most describing sentence for their current I.T. application status. Results were shown in the following table.

The majority participants believed they were in the stage of “Full I.T. implementation with integration with other internal systems”, 14 out of 25 participants opted for this stage which accounted for 56% of the total participants. It was followed by the stage “Apply limited I.T. solution to automate a specific area of operations (e.g. document management system, warehousing system but not full ERP, finance & accounting system only, etc.)”, 8 out of 25 participants opted this sentence which accounted for 32% of the total participants.

Only 2 out of 25 (8%) indicated that they had full I.T. implementation with an integration with both internal and external systems. They were Metal and Garment manufactures from Mainland.

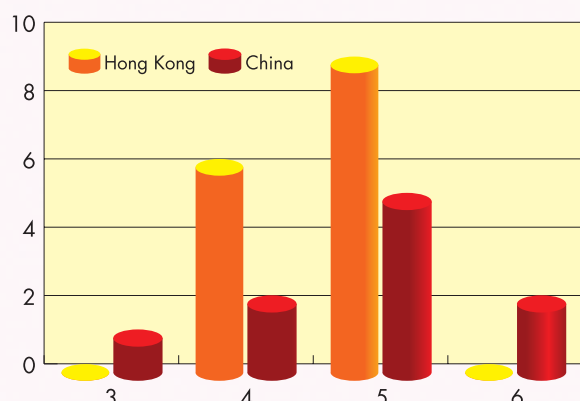
3.2 Table

Current I.T. Application Status Summary

Current I.T. Application Status	# of Participants	%
1. Totally manual, no hardware & software	0	0%
2. No knowledge and awareness of I.T. application. The company has no I.T. solution to solve for daily operating issues (except MS Office, public email account, etc.)	0	0%
3. Have knowledge and awareness of I.T. application but don't use any I.T. solution (except MS Office, public email account, etc.)	1	4%
4. Apply limited I.T. solution to automate a specific area of operations (e.g. document management system, warehousing system but not full ERP, finance & accounting system only, etc.)	8	32%
5. Full I.T. implementation with an integration with other internal systems	14	56%
6. Full I.T. implementation with an integration with both internal and external systems	2	8%
Total	25	100%

3.2 Chart

Current I.T. Application Status Summary



Remarks:

- 3. Have knowledge and awareness of I.T. application but don't use any I.T. solution (except MS Office, public email account, etc.)
- 4. Apply limited I.T. solution to automate a specific area of operations (e.g. document management system, warehousing system but not full ERP, finance & accounting system only, etc.)
- 5. Full I.T. implementation with an integration with other internal systems
- 6. Full I.T. implementation with an integration with both internal and external systems



BROAD COVERAGE FINDINGS

3.3 Analysis by Satisfaction Level of Current I.T. Application Status

In this section, participants were asked to rate their satisfaction level of current I.T. Applications. Most of the applications received less than 80%, reasons included 1) some steps were still done manually 2) data were not up-to-date 3) Not all modules were integrated in the system 4) Cost concerns.

3.3(a) Table

Analysis by Satisfaction Level of Current I.T. Application Status

	WMS	ACC	ERP	PO	HR	CAD/CAM	Bar Code	MRP	SIM	EDI	WiFi	CRM	FMS	PDA	BI	RFID	GPS
# of Participants	18	17	17	13	12	12	11	10	10	7	6	5	4	3	3	2	1
Satisfactory Level	72%	85%	77%	82%	79%	90%	78%	70%	78%	76%	77%	72%	85%	73%	67%	70%	100%

3.4 Analysis by RFID

16 participants had opinions on RFID, and only 3 were current user of RFID (2 were China company while one 1 was Hong Kong company which was in pilot usage of RFID). There were 6 participants (38%) commented that they were reluctant to adopt RFID because of cost factor; while 2 participants (13%) found RFID could not fit in their typical business operation (1 commented that RFID cannot water proof while another participant commented that they have only limited types of raw materials.); But among the 16 participants, 5 (31%) of them stated that they would consider RFID in the near future.

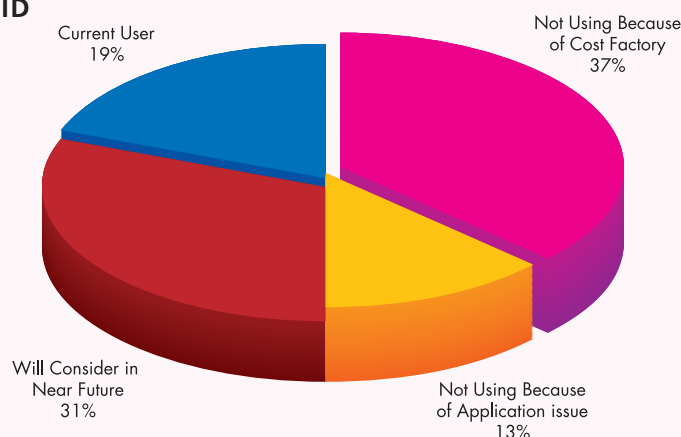
3.4 Table

Analysis by RFID

	# of Participants	%
Current User	3	19%
Not Using Because of Cost Factor	6	38%
Not Using Because of Application Issue	2	13%
Will Consider in Near Future	5	31%
Total	16	100%

3.4 Chart

Analysis by RFID





BROAD COVERAGE

FINDINGS

4 I.T. Applications Barriers and Concerns

In this section, the biggest challenges in I.T. applications perceived by participants and the motivating factors for adopting I.T. were examined. Finally participants were requested to ranked 3 factors (People, Technology and Budget) when deploying I.T. application in their companies.

The participants were asked to indicate the biggest challenges they faced with technology adoption. Participants were asked to rate the selected items in terms of the degree of challenge. (1 = Less challenging; 5 = Most challenging).

1	2	3	4	5
Less challenging				Most challenging

For each factors answered by the participants, we had selected those who rated 4 or 5 for that particular factor for analysis. The findings were summarized in Table 4.1.

The finding suggested that the three biggest challenges were *Data Integration; Shortage of skilled I.T. People and User's recognition on application value is low* respectively.

- Data integration (38%)
- User's recognition on application value is low (36%)
- Shortage of skilled I.T. people (32%)

4.1 (a) Table

Summary on Participants' Perceived Challenges for I.T. Applications

Challenges for I.T. Applications	# of Participants	Rating on 4 to 5 (Challenging to Most Challenging)	%
1. Data Integration	21	8	38%
2. User's recognition on application value is low	22	8	36%
3. Shortage of skilled IT people	22	7	32%
4. Difficult to cope with rapid technological changes	18	5	28%
5. Limited Budget	20	5	25%
6. Lack of industry / government support	18	4	22%
7. Difficult to assess ROI	19	4	21%
8. Complexity of application software	17	2	12%

However, we saw there was a difference between China and Hong Kong participants in weighing the perceived challenges in adopting I.T. For Hong Kong participants, they believed low user's recognition on application is the most challenging factor (80%) followed by Shortage of skilled I.T. people (75%), Lack of industry / government support (75%), and Limited Budget (71%). On the other hand for the China participants, they have rated Complexity of application software was the most challenging factor (100%) whereas Data integration was the second (63%).



BROAD COVERAGE FINDINGS

4.1 (b) Table

Comparison on Participants' Perceived Challenges for I.T. Applications by Location

	Hong Kong (# of Participants / %)		China (# of Participants / %)		Total (# of Participants / %)	
Data Integration	3	37%	5	63%	8	100%
User's recognition on application value is low	4	80%	1	20%	5	100%
Shortage of skilled IT people	6	75%	2	25%	8	100%
Difficult to cope with cope with rapid technological changes	2	50%	2	50%	4	100%
Limited Budget	5	71%	2	29%	7	100%
Lack of industry/government support	3	75%	1	25%	4	100%
Difficult to assess ROI	2	40%	3	60%	5	100%
Complexity of application software	0	0%	2	100%	2	100%

4.2 Analysis on Motivating Factors

The participants were asked to rate the most important motivating factors when deciding to enhance or upgrade their technological capabilities and customer offering.

The majority participants believed that I.T. applications can Improves Operational Efficiency (96%); they believed I.T. could Improves Data Quality (92%). Participants provided information were summarized in the following table.

4.2 Table

Motivating Factors for Enhancing Technological Capabilities

Motivating Factors	# of Participants	Weighed (Least to most Challenging)	%
1.Improve Operational Efficiency	24	23	96%
2.Improve Data Quality	24	22	92%
3.Reduce Human Error	23	18	78%
4.Improves Customer Service	23	17	74%
5.Reduce Labor Cost	21	12	57%
6.Corporate Image	21	11	52%
7.Direct Customer Request	22	11	50%
8.Clear ROI	20	10	50%

4.3 Ranking on the Criteria (People, Budget and Technology)

The participants were asked to rank on the three concern areas on an I.T. application (People / Price, Budget / Technology). In a total of 25 participants' provided information, the majority ranked Technology the first criteria (40%), followed by Price/ Budget (36%) and finally People (24%).



BROAD COVERAGE FINDINGS

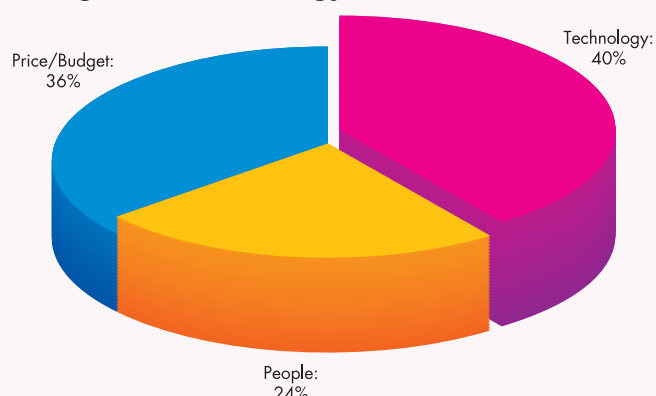
4.3(a) Table

Ranking on People, Budget and Technology

	People	Price/ Budget	Technology	Total
HK	5	7	3	15
China	1	2	7	10
Total	6	9	10	25
%	24%	36%	40%	100%

4.3(a) Chart

Ranking on People, Budget and Technology



However, we saw a difference between China and Hong Kong participants in rating the perceived concerns in adopting I.T. For Hong Kong participants, 7 out of 15 (47%) ranked Price/ budget the most concern area whereas 7 out of 10 (70%) of the China participants, the majority ranked Technology were the most concern area.

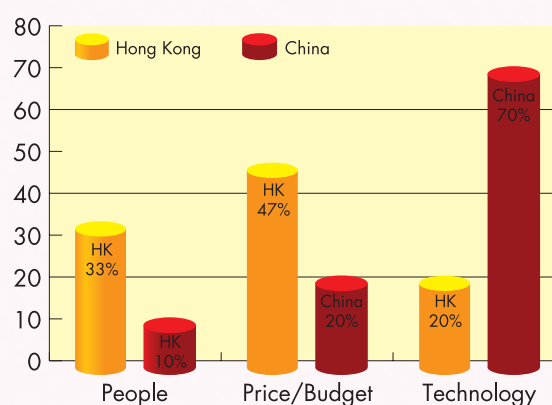
4.3(b) Table

Comparison on People, Budget and Technology by location

	Hong Kong		China	
People	5	33%	1	10%
Price Budget	7	47%	2	20%
Technology	3	20%	7	70%
Total	15	100%	10	100%

4.3(b) Chart

Comparison on People, Budget and Technology by location





BROAD COVERAGE

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5. Industry Trends/ Characteristics

In this section, participants were asked to give opinions on how their industry characteristics would affect their technology application needs in the future. In total of 25 participants, the information indicated that the majority industry trends/ characteristics were:

- New labor law implemented by PRC government incur increase in cost (76%)
- Factories are moving to areas outside of Pearl River Delta, such as Northern China, India or Vietnam. (52%)

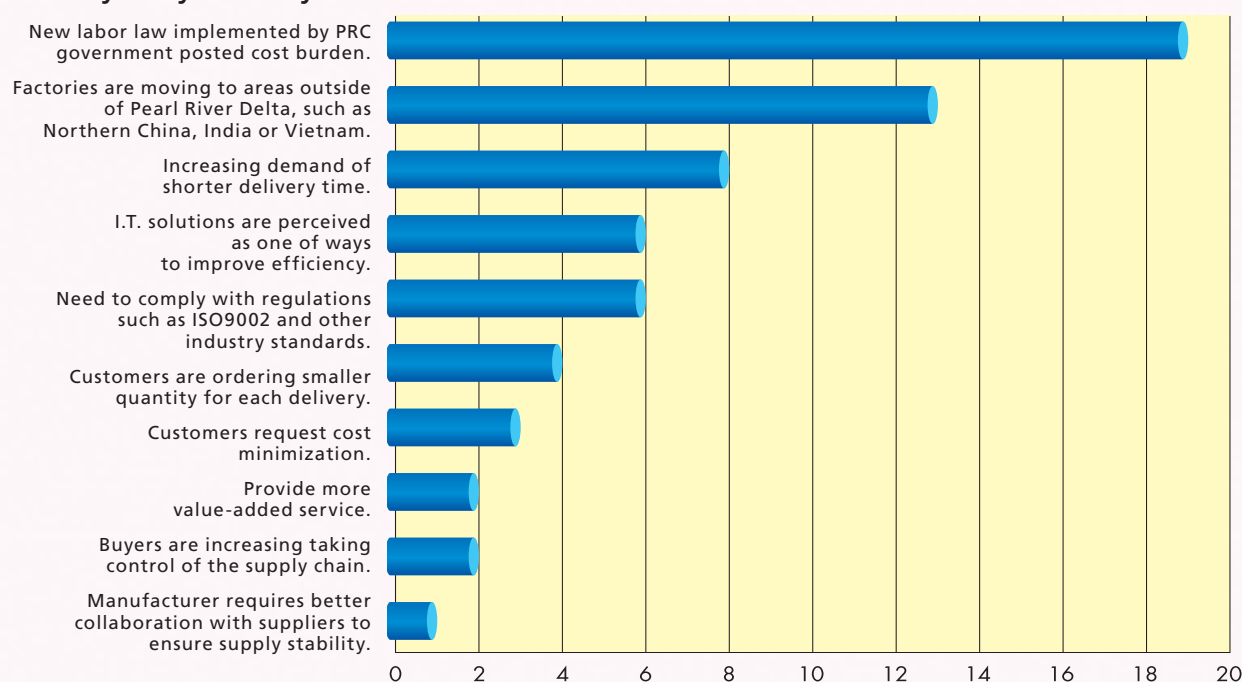
5 Table

Industry Trends/ Characteristics in the manufacturing industry

Industry Trends/ Characteristics	# of Participants	%
1. New labor law implemented by PRC government posted cost burden.	19	76%
2. Factories are moving to areas outside of Pearl River Delta, such as Northern China, India or Vietnam.	13	52%
3. Increasing demand of shorter delivery time.	8	32%
4. I.T. solutions are perceived as one of ways to improve efficiency.	6	24%
5. Need to comply with regulations such as ISO9002 and other industry standards.	6	24%
6. Customers are ordering smaller quantity for each delivery.	4	16%
7. Customers request cost minimization.	3	12%
8. Provide more value-added service.	2	8%
9. Buyers are increasing taking control of the supply chain.	2	8%
10. Manufacturer requires better collaboration with suppliers to ensure supply stability.	1	4%

5 Chart

Analysis by Industry Trend / Characteristics





BROAD COVERAGE

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6 Future I.T. Applications Analysis

In this section, participants were invited to comment on their future I.T. strategic plans. I.T. applications and their current I.T. investment budget level were also examined.

6.1 Analysis by Future I.T. Applications

Participants were asked to provide comment on their future I.T. strategic plan. 13 areas ranging from Product Design, sales and marketing purchasing / supplier relationship to forecasting / event management were outlined for participants' feedback.

The top three areas that participants indicated to improve or invest in the future were:

- Product design (52%)
- Forecasting / Event Management (48%)
- Production process control and management (48%)

6.1 Table

Analysis by Future I.T. Applications

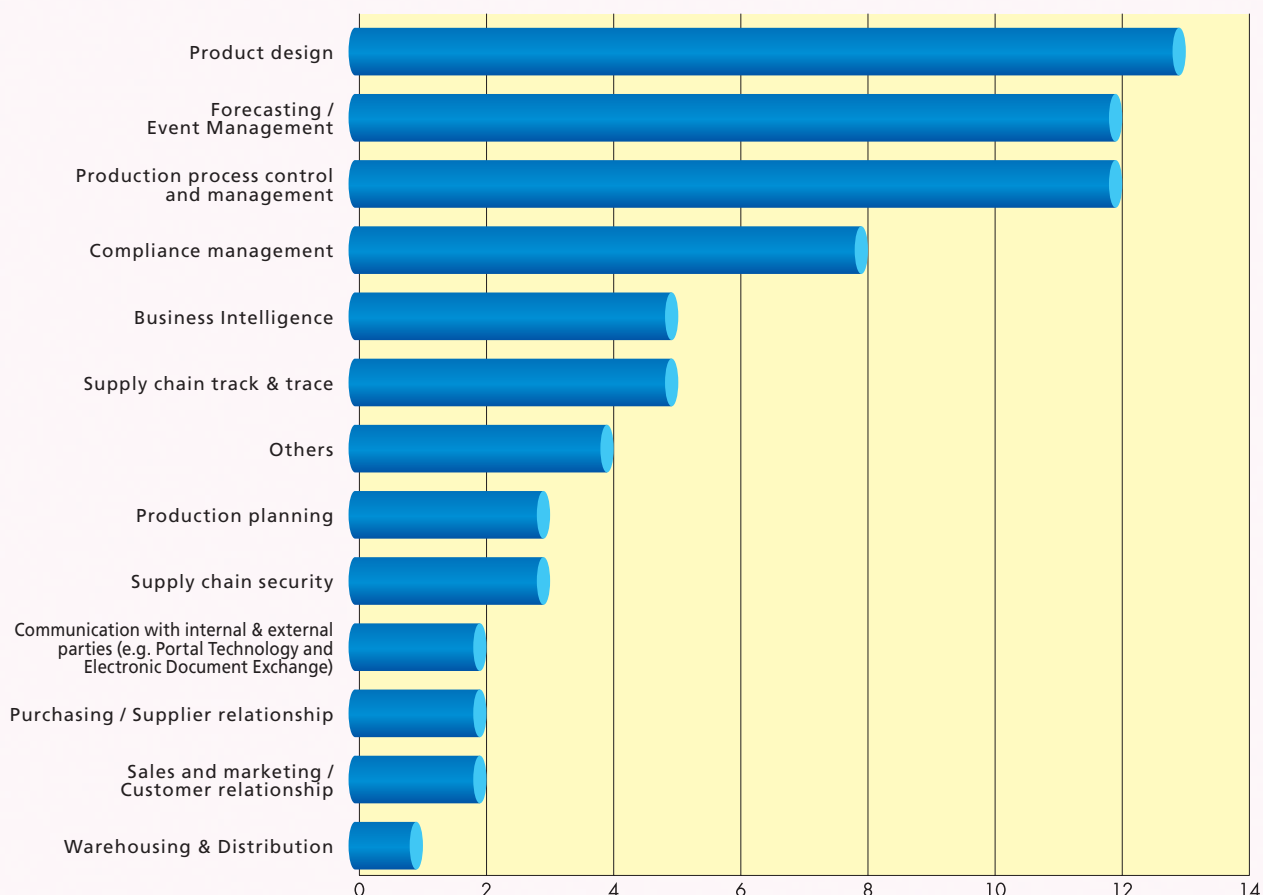
Future Applications	# of Participants	%
1. Product design	13	52%
2. Forecasting / Event Management	12	48%
3. Production process control and management	12	48%
4. Compliance management	8	32%
5. Business Intelligence	5	20%
6. Supply chain track & trace	5	20%
7. Others	4	16%
8. Production planning	3	12%
9. Supply chain security	3	12%
10. Communication with internal & external parties (e.g. Portal Technology and Electronic Document Exchange)	2	8%
11. Purchasing / Supplier relationship	2	8%
12. Sales and marketing / Customer relationship	2	8%
13. Warehousing & Distribution	1	4%



BROAD COVERAGE FINDINGS

6.1 Chart

Analysis by Future I.T. Applications



6.2 Analysis on Current I.T. Adoption Cost

Participants were further asked to provide information on the percentage of the total cost in their I.T. adoption (current I.T. investment cost – to – revenue). 17 participants provided information and the findings were summarized in the following table.

6.2Table

Current Investment % to Revenue

Current Investment % to Revenue	# of Participants	%
Less than 1%	6	35%
1% - 3%	4	24%
4% - 6%	3	18%
7% - 9%	0	0%
Over 9%	4	24%
Total	17	100%



BROAD COVERAGE

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7 R&D Demand & Aspiration

In this section, we asked participants on their R&D demand and aspiration from government; and the government sponsored R&D program acceptance were examined.

7.1 Analysis by Industry/Government Support

Participants were invited to provide comments and suggestions on industry / government support areas which were needed in IT adoption.

In all 25 participants' provided information, the majority agreed the value of LSCM, 23 out of 25 participants (92%), other important suggestion on Industry / Government support included R&D Initiative (60%); Education (60%).

7.1 (a) Table

Government Support Areas needed in I.T. adoption

Government Support Areas needed in I.T. adoption	# of Participants (HK & China)	%
Participants agreed the Value of LSCM	23	92%
Financial Support	13	52%
R&D Initiative	15	60%
Education (Awareness on I.T. application)	15	60%
Explore Market	3	12%
Environmental protection requirement / Regulations	5	20%

For the Hong Kong participants, they were further asked if they were interested in participating in R&D projects and their preferences on:

- 1.If government is willing to support 90% over the total cost of such R&D project, are you willing to invest together with other companies within the industry the remaining amount and share the project deliverables;
- 2.If government is willing to support 50% over the total cost of such R&D project, are you interested in invest the remaining amount and own the IP rights of the project deliverables.



BROAD COVERAGE FINDINGS

The findings were summarized in the following table.

7.1 (b) Table

Government Sponsorship R&D Scheme rated by participants

Government Sponsored Scheme	# of Participants (HK)	%
Interested in Participating in R&D Projects	9	60%
Government support 90% Scheme	5	33%
Government support 50% Scheme / Company Own the IP right	3	20%

For the 10 China participants, they were asked to indicate the interested areas of LSCM R&D roadmap:

RFID Hardware & System

6 out of 10 (60%) participants indicated that they are interested in Theme 1 “Low Cost RFID Tag Manufacturing Techniques” is set on easing the cost issue of adoption and deployment for RFID.

Networking & Infrastructure Technologies

4 out of 10 (40%) participants indicated that they are interested in Theme 6 “Enabling Technologies for Enterprise e-Logistics Internetworking”, fostering the use of IT for logistics integration, addresses the common problem in industry for effective and efficient business process integration across enterprise boundary.

Applications & Decision Support Technologies

3 out of 10 (30%) participants indicated that they are interested in Theme 10 “Positioning Technologies and Optimization for Asset Tracking and Monitoring” will add to the capability of real-time cargo tracking.

Another 30% participants are interested in Theme 11 “Enabling Technologies in Electronic Seal Based Logistics” participates in the contemporary e-seal standards development which is taking place actively not only in the global arena but also across the local border of Hong Kong and Shenzhen.



BROAD COVERAGE FINDINGS

7.1 (c) Table

Interested areas of LSCM R&D roadmap

Themes	# of Participants (China)	%
RFID Hardware & System		
1. "Low Cost RFID Tag Manufacturing Techniques" is set on easing the cost issue of adoption and deployment for RFID	6	60%
2. "RFID for Manufacturing and Packaging Industries" stresses on easy use of RFID for product manufacturers who need to tag product shipment with RFID	2	20%
3. "RFID Testing and Qualification" targets for helping users to test and select appropriate RFID solutions to best fit their use	0	0%
4. "RFID beyond Gen 2" is to push the envelope of current RFID technology to support practical applications for range, accuracy, security, memory and sensor requirements	1	10%
Networking & Infrastructure Technologies		
5. In the infrastructure technologies track steers for low-barrier adoption of logistics IT with the approach of "On-Demand Technologies for Logistics Application Software Service Platforms"	2	20%
6. "Enabling Technologies for Enterprise e-Logistics Internetworking", fostering the use of IT for logistics integration, addresses the common problem in industry for effective and efficient business process integration across enterprise boundary	4	40%
Applications & Decision Support Technologies		
7. "RFID Systems for Specific Environments" will foster the development for RFID application systems for niche but critical requirements in common logistics operations	0	0%
8. "Enabling Technologies for Mobile Logistics" encourages innovative applications for distribution and delivery which are mobile in nature	1	10%
9. "Sensor-enabled Logistics Applications" will enable automation in cargo monitoring	0	0%
10. "Positioning Technologies and Optimization for Asset Tracking and Monitoring" will add to the capability of real-time cargo tracking	3	30%
11. "Enabling Technologies in Electronic Seal Based Logistics" participates in the contemporary e-seal standards development which is taking place actively not only in the global arena but also across the local border of Hong Kong and Shenzhen	3	30%

In summary, participants were very positive to the value of LSCM (92%); they all showed interests in participating in the government funded R&D project; while other comments on government initiatives were summarized as follow.

- 60% of participants from Hong Kong shown interests in participating in R&D projects;
- 60% agreed government should take the R&D Initiative;
- 60% commented that Government should promote Education on I.T. (Awareness on I.T. application).



BROAD COVERAGE RECOMMENDATIONS

8.1 Foster Industry and Government

To increase the user recognition, it is recommended that manufacturers should take the initiative to keep track of the latest development of relevant I.T. applications which are beneficiary to their particular industry. In Section 7, industry practitioners expressed their expectation towards Government. They expected Government to take the lead in I.T. application education (60%, details refer to Table 7.1a) including organize more seminars on upgrading the I.T. applications for specific industries so as to the industry I.T. application value and transfer technology knowledge. Through attending industry seminars on I.T. application, manufacturers and I.T. managers can enhance their I.T. application knowledge and learn from successful case studies on Supply Chain Management.

8.2 LSCM to Facilitate Technology Adoption through R&D

In Section 7, 60% of both Hong Kong and China participants agreed the Government should take R&D initiatives on I.T. adoption. For Hong Kong participants, 60% have shown positive interests in participating in Government sponsored R&D Scheme. (Details refer to Table 7.1b) Being a bridge between Government bodies and industrial practitioners, LSCM will further explore the feasibility on various sponsorship schemes on funding programs and announce the information through its website to seek industrial opinions or invite applications.

LSCM was commissioned to provide a one-stop shop for technology transfer and commercialization. It would carry out projects that aim to break down the technology barriers in hardware, software, systems and network design and development. In addition, it would contribute towards the design and adoption of unified industry standards; enable companies in the Pearl River Delta region to deploy the RFID technology and develop innovative logistics and supply chain management applications.

8.3 MRP Improves Efficiency

In Section 2, the majority of the participants commented that the most time consuming (47%, details refer to Table 2a) and most costly (47%, details refer to Table 2b) business process is Procurement of Raw Materials. Due to increasing raw materials cost, better management of procurement is crucial to control inventory level, transportation costs and wastage level. While in Section 3, it has shown that the current usage of Materials Requirement Planning (MRP) is relatively low, only 44% among the participants have been using MRP. (Details refer Table 3.1)

As its name suggested, MRP provides answers for procurement decision include: What items are required? How many are required? When are they required?

MRP can be applied both to items that are purchased from outside suppliers and to sub-assemblies, produced internally. Companies need to control the types and quantities of materials they purchase, plan which products are to be produced and in what quantities and ensure that they are able to meet current and future customer demand, all at the lowest possible cost.



BROAD COVERAGE RECOMMENDATIONS

8.4 Strategic I.T. Mapping to Meet Challenging Business Environment

In Section 5, it has examined how the participants' industry characteristics and trends that would affect their technology application needs. Among the various factors, it was found that (1) New labour law imposed by PRC Government increased manufacturers' cost; (2) Factories shifting to areas outside Pearl River Delta, such as Northern China, India or Vietnam; and (3) Increase demand of shorten delivery time. These three factors affected manufacturers most which accounted for 76%, 52% and 32% respectively of the findings. (Details refer to Table 5.1)

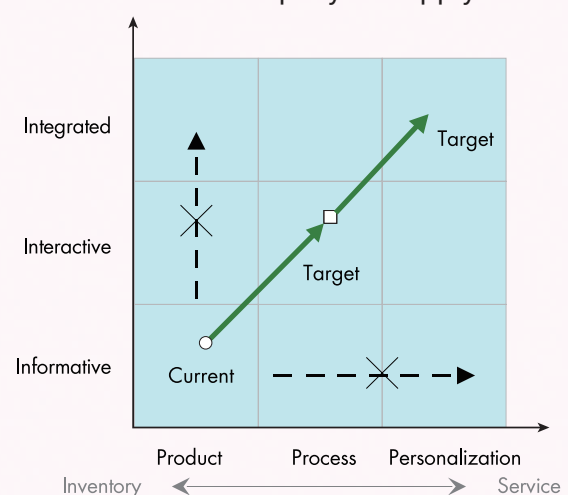
In view of the changing and challenging business operation environment, better I.T. applications adoption in the supply chain management can increase overall efficiency and competitiveness. Firms have been seeking the strategies for technologies adoption to improve the internal performance and to streamline the processes with both upstream and downstream partners. Emerging information technology in addition to production technology plays as the main driving force.

First and foremost, in order to form a competitive strategy, manufacturing practitioners should identify its Current Position, decide the Projected Position and adopt the technology to achieve the goal. A framework of Strategy Position Map (Diagram 8.1) is used to locate, set and move company's strategy position based on the adoption of both the Information technology and Product technology.

The improvement for supply chain management can be made in two aspects – Information and Product. The stages for Information technology are: informative, interactive and integrated. The informative stages is about the intra-company information availability; the interactive stage focuses on the inter-company information exchange; and the integrated stage is mainly concerned the coordination of information processing on the chains.

On the other hand, the stages for Product technology are: product, process and personalization. The product stage is about the product related issues, including design, storage, etc.; the process stage is to streamline the processes to ship, distribution, or forward the product; the personalization stage is concerned the adaptiveness, responsiveness and customization. The main focus of product stage is inventory management and personalization stage is more into the service management. The aspects of information and product denote the status of the current performance status of a company or supply chain. Similarly, the production and logistics technology function as a drive to improve the product aspect as moving rightward.

In order for companies to improve their performance along the supply chain, they are recommended to move towards the Projected Position by (1) Balanced (to keep and move toward the balanced position between the information technology and production technology) and (2) Economic (to move along the diagonal line than the straight line to achieve cost effective outcome) strategy. The optimal move is highlighted in green arrow in Diagram 8.1.



8.1 Diagram Current position and projected position



BROAD COVERAGE RECOMMENDATIONS

8.5 Demands for Adopting RFID

In Section 3, it was found that the current usage of Bar Code is more common than Radio Frequency Identification (RFID), 56% Vs 12%. (Table 3.1). Among the 25 participants, 14 out of 25 (56%) participants are currently using Bar Code whereas only 3 are using RFID, (2 are China companies while 1 is Hong Kong company which is in pilot stage).

In Section 3.4, we have further gathered the opinions on RFID application from 16 participants successfully. Among the 16 participants who have given opinions, 6 participants (38%) commented that they were hesitant to adopt RFID because of Cost Factor; 2 participants (13%) found RFID could not fit in their typical business operation. Despite the currently low usage level, 5 out of 16 participants (31%) stated that they will consider RFID in the near future.

In terms of sensitivity and durability, RFID has proven advantages over Bar Code and it has greater flexibility and potential in Supply Chain Management applications.

RFID is a method of remotely storing and retrieving data using devices called RFID tags/transponders. An RFID tag is a small object, such as an adhesive sticker, that can be attached to or incorporated into a product. RFID involves putting a small radio transmitter on a tag or a label with a unique identification number (UIN) on it. When passed under a RFID reader, the number contained in the tag is transmitted to a computer, which matches it with corresponding data simultaneously.

Since radio waves are used to sense the tag, RFID has the advantage that no line-of-sight alignment is required between the RFID tag and the reader. It allows the RFID reader to read multiple tags simultaneously and instantly. The tags may be embedded inside an object such as a container or in a textile. In terms of storage capacity, RFID tags can store a lot more information than traditional bar codes.

While RFID-enabled supply chain have proven beneficial advantages, as the survey findings suggested, since the cost for producing tags, scanners and labour costs remains high, the relatively high adoption cost of RFID is still the main obstacle for its being widely deployed.



RFID is a new and very innovative technology with core values developed in the 21st century. It has earned high regard from global industries and general attention from the governments of different countries. The manufacturing sector in China possesses the most comprehensive array of product types, is the most important production processing base and consumer market of information technology products in the world as well as the world's third largest trade nation. There is therefore an enormous market space and consequently a rare opportunity for the application and development of the RFID industry. This sector is poised to become the shining spot for China's information technology industry, and further promotes the horizontal and vertical developments of the country's golden card project. The managerial levels of the Chinese government are highly focused on RFID technology as well as the development of the industry and its applications. They insist on combining their own efforts and to elevate the developments of RFID industry and its applications.

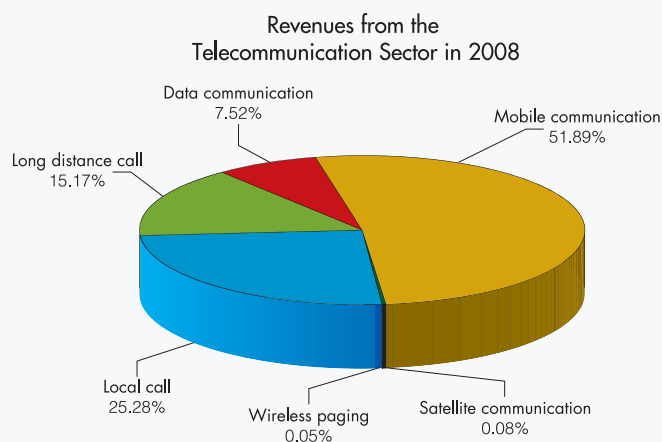
1. Review of the Development of China's Information Industry in 2007

The information technology industry is the leading strategic industry in China. It has prompted the building of an informatization construction and brought China firmly into the new IT age. It is also the key to promoting balanced economic development, harmonized society, and innovative technology. The IT industry is the largest scale industry in China and is the second largest in the world, with the United States being the largest.

The development of China's information industry has progressed at a tremendous speed over the past decade, marking the historical significance of the era. To date, China has the most advanced communications equipment and the largest client base in the world. It has developed as the top pillar industry and the largest foreign trade sector in the country.

Most importantly, the information technology and the information industry have become the most important driving forces of economic and social developments globally. Progressing is happening at a fast pace and is largely prompting economic and social developments – elevating the living standard of local residents.

China's information industry maintained a steady growth in 2007, realizing a total business volume of RMB2 trillion, representing a rise of 25.6% compared to 2006. Among all sectors, the telecommunications sector generated sales of RMB858 billion, the value-added business at RMB210 billion, an increase of 25%. The number of fixed line and mobile phone users reached 368 million and 546 million respectively, and Internet users exceeded 200 million. The total investment of telecommunication fixed assets was valued at RMB230 billion. The total sales of the electronic information industry were valued at 5.6 trillion, rising 18%. Among this, the software industry registered RMB580 billion, rising 20.8% and with an export value of US\$450 billion, an increase of 23.6%, representing a ratio of 37.6% of the country's total export. The added value of information technology accounted for 7.9% of the country's GDP, with each sector has achieved remarkable results.



From January to February, 2008, the revenues of mobile and data communications increased 16.1% and 55.4% respectively compared to the same period in 2007.



Exports of Major Electronic Products in 2008

Product Names	Units	Quantity of Exports (10,000)	Export Value (US\$100 Million)	Compared Increase Rate in Exports (%)
Portable Computer	1	7,302.6	530.9	38.1
Mobile Phone	1	48,341.3	356.0	14.1
Integrated Circuit	1	4,070,731.6	235.4	16.1
LCD Display	1	187,974.8	196.4	51.7
Monitor	1	11,734.0	181.8	8.1
Color TV	1	4,788.3	90.1	14.5
Digital Camera	1	1,1042.5	77.7	23.6
Laser Disc Player	1	15,039.1	64.6	-9.5
Micro-Computer	1	874.7	58.5	20.1
Printer	1	3,896.6	47.2	-29.9

2. Application of RFID is an Integral Part of Informatization Construction

The golden card project is one of the four essential components of the national informatization construction. In 1993, with the full support of the Central Government and the direct guidance of the State Council, it focused on electronic currency application that affects the development of the national economy, the society and the benefits of the general public. It is a project of huge social system which involves cross-departmental, cross-regional and cross-century, and is also an important element to informatization construction. Thanks to the care, support and guidance from the national leaders, as well as close collaborations, common efforts, full explorations, brave accomplishments and a lot of hard work, the golden card project has steadily progressed and has achieved remarkable results over the past 15 years. The innovative golden card system combines the applications of multi-functional smart card and RFID – an integral part of the country's informatization construction and a remarkable significance of the country's growth of economic development. Following the trend of development in IT technology, China will grasp the opportunity and greatly promote the use of smart card and RFID technology. With regards to the full accomplishment of modern IT technology and the building of an innovative country, the making of a capitalized and harmonized society is meaningful yet achievable on their own terms.

3. Development of RFID Industry and Application is an Important Measure to the Realization of the Party's and Country's Informatization Strategy and Industry Development Policy

The first 20 years of the 21st century is expected to be the strategic period for China to develop economically and socially. It is also an opportunity for the country to expand within the science and technology fields. During the Fifteenth-Fifth mid meeting the informatization of the country was reported to have reached new heights. While at the Sixteenth-Fifth meeting the party proposed the strategy of "industrialization driven by informatization; industrialization promotes informatization and riding towards new industrialization". The party has reiterated to "promoting national economy and social informatization, and accelerating the expansion of economy". At the Seventeenth-Fifth meeting the party proposed the "acceleration of the change of economic development, and promotion and elevation of industrial structures. This is an important strategic mission associating with the national economy." In order to "fully understand the new missions brought by industrialization, informatization, urbanization, marketization and internationalization," "insist to follow the new and autonomous and innovative road with Chinese faire", "endeavor to follow the new



industrialized road with Chinese faire, and "to greatly facilitate the merger of informatization and industrialization". China should make good use of the historic opportunity, put informatization construction on top of the list, follow the road of industrialization, and increase social productivity.

Entering into the 21st century, new technology has developed drastically and new breakthroughs have remarkably altered the face of the economy and society. The development of information science and technology will continue to be the major power driving the sustainability of the economy, with the applications of science technology revolving on a quick speed, creating opportunities to leverage business. This is why we should stay ahead of time and embrace new science, in particular the opportunities and challenges from the Internet, with a world vision. We are getting ever more reliable in terms of this development and innovation of technology which promotes productivity and enhances a complete, harmonized and sustainable society.

4. About "White Paper on China's RFID Technology and Policy"

The development of RFID Industry and application covers many sectors, departments and areas. It is a project of huge social system which must be well organized, recognized, collaborated and rationally integrated using the maximum amount of resources and capital. In 2005, the Ministry of Science and Technology has compiled "White Paper on China's RFID Technology and Policy" with 15 other ministries and departments, including the National Development and Reform Commission, the Ministry of Commerce, the Ministry of Information Industry, the Ministry of Transport, China Customs, the Ministry of Railways, the Ministry of Public Security, the Ministry of Education, the Ministry of Housing and Urban-Rural Development, the Ministry

of Agriculture, the General Administration of Quality Supervision, Inspection and Quarantine, the Standardization Administration, the State Post Bureau and the State Food and Drug Administration. Consisting of five parts, the White Paper was published on June 2006 after several revisions. Based on the rules of science, forward thinking and guidance, it strives to provide a systematic guidance of RFID technology for China's industries in the coming years.

The White Paper describes the overall targets of the development of RFID technology in China as: providing solutions with technology, and breaking through a series of RFID common key technologies, industry key technologies and application key technologies. It also aims to nurture talents in the research and development of RFID technology, and to build an autonomous and innovative Chinese system and obtain core technology in intellectual property. Based on autonomous research and alliance strategy before competition, the industry is expected to maintain major market shares with the collaboration of the industry's associations and enterprises and to take controls of the supply chain of the intellectual property. Thanks to the implementations and demonstrations of the project and the innovative mode of applications, RFID technology has been widely used among local industries, making it the public applications of a large-scale and radioactive expertise.

The White Paper clearly indicated that the future development of RFID industry in China will: increase focus on enterprises, be promoted by the government, confer with industry alliance, build a RFID industry chain of autonomous intellectual property skill, build an internationally competitive brand with the infrastructure of the industry base, increase the overall level of the RFID industry in China and enhance international collaboration and knowledge exchange.



The White Paper also reiterated that one of the ways to develop RFID is to further perfect the industry policies and to introduce new financial channels and models, in order to build a RFID industry base. This is pivotal to the realization of a well developed technology and industry, which helps to promote the formation and development of the RFID industry.

5. Contents of the Key and Special Projects of the National High-tech R&D Program (863 Program) in the 11th 5-Year Plan

In September 2006, the Ministry of Science and Technology released "The 11th 5-Year Plan" – the National High-tech R&D Program (863 Program), the Technology and Application of RFID in the Advanced Manufacturing Technology Area and the Application Guidance of the Curriculum in 2006. The Ministry has clearly indicated that during the "11th 5-Year Plan" period, China's development of RFID technology and industry will continue to merge autonomous and integrated innovations, and to increase focus on enterprises and adopt an autonomous development model based on policy, production, learning, research and application aspects. With regards to the common ground, forecast, industrialized key technology and application key technology of the RFID the Ministry has obtained a series of intellectual property rights autonomously, and has achieved core technology on par with international level – building up China's RFID technology with its own innovative strength.

The demonstrations and applications of RFID have prompted diverse applications in numerous industries and have gradually created a large-scale and radio-active related system of public application services. The country's RFID standardized system is implemented through research. The RFID industry provides a great service to the environment and to implement RFID technology and industrialized strategic alliance via alliance and collaboration – building an industrial chain based on intellectual property skills.

6. Prior Development of Important Areas of the New & High-tech Industry as Stipulated by the "Three-Ministry & One-Bureau"

In January 2007, the National Development and Reform Commission, the Ministry of Science and Technology, the Ministry of Commerce and the State Intellectual Property Office collaboratively revised the "Guidelines for Prior Development of Important Areas of the New & Hi-tech Industry (2007)", and stated that RFID is one of the priorities in the development of information and science industry. It includes: Ultra-high and high frequency chips, tags and readers; high speed and low cost tag packaging equipment; application system integration; real time management and middleware products; distributed RFID code resolution service system; code resolution security management system; public information service system; RFID testing; RFID and mobile communication; sensor technology; biometrics identification technology and applicable demonstrations for different industries and areas.



APPENDIX A

DISCUSSION GUIDE - MANUFACTURING

Background Information

- Company Name, job title and/or department
- Size of Company – No. of staff in Hong Kong, Mainland China and Overseas
- No. of I.T. staff in Hong Kong, Mainland China and Overseas
- Year of Establishment
- Business Nature (e.g. Toy, Watch, Garment, Electronic Component)

Section A:

Business Process

In this section, we ask participants how they typically do their business to identify information flow and technology needs derived from their business processes.

A generic work flow diagram applicable for the industry sector being studied

- This work flow diagram outlines typical workflow of your industry, say how you prospect/satisfy your customers, design your products, plan and control production, manage material flows as well as finished goods distribution to your customers. How far do you think this diagram illustrates how you do your business? Do you have anything to add?
- As per above work flow diagram, what kind of information flows is critical for your operations?
- Which process is the most time consuming?
- Which process is the most costly?
- What are the critical areas in your business processes while collaborating with other business partners along the supply chain, such as suppliers, buyers, 3PL, etc.?
- What is the pain point(s) you see in your business processes in complying with relevant governmental and industrial regulatory authorities?

Section B:

Current I.T. Application Level

In this section, we ask participants how they currently apply information technology for their business operations.

A slide illustrating possible I.T. solutions for their business operations

- What I.T. solutions are you using? Why or why not (Section C)? Who is/are the service providers? And what about the service model?
- How does information technology fit in the above processes? (e.g. CRM for sales & marketing, ERP for production & logistics management, EDI with external parties via DTTN, etc.)

If RFID is checked as one of the possible I.T. solutions, please also ask the following questions:

How specifically RFID technology is related to you?

How do you perceive the value of RFID brought to you and to the industry (or the entire supply chain) at large?

- Are you using information platform (HK, Mainland China and Overseas) to collaborate with your business partners? (e.g. DTTN, Savi.net)
- How satisfied are you with the current technology solutions within your company today?
Please rate the selected items in terms of the degree of satisfaction.
(1 = Less satisfied; 5 = Most satisfied)
- How competitive are you with the current technology solutions Vs the industry today?
(1 = Less competitive; 5 = Most competitive)
- In addition to your current status, how competitive and in what areas you think you are in view of the next 5 years of the development trends?
- What are the improvements you have noticed?



APPENDIX A

DISCUSSION GUIDE - MANUFACTURING

Section B:

Current I.T. Application Level

Show a multiple choice sheet for participant's selection

- Please click the following most describing your current I.T. application.
 Totally manual, no hardware and software
 No knowledge and awareness of I.T. application. The company has no I.T. solution to solve for daily operating issues (except MS Office, public email account, etc.)
 Have knowledge and awareness of I.T. application but don't use any I.T. solution (except MS Office, public email account, etc.)
 Apply limited I.T. solution to automate a specific area of operations (e.g. document management system, warehousing system but not full ERP, finance & accounting system only, etc.)
 Full I.T. implementation with an integration with other internal systems
 Full I.T. implementation with an integration with both internal and external systems

Section C:

I.T. Application Barriers & Concerns

In this section, we ask participants what are their concerns and difficulties to apply I.T. solutions.

- What is the biggest challenge your company faces with technology adoption?
 Please rate the selected items in terms of the degree of challenge.
 (1 = Less challenging; 5 = Most challenging)
 data integration
 limited budget
 difficult to assess ROI
 difficult to cope with cope with rapid technological changes
 shortage of skilled IT people
 user's recognition on application value is low
 lack of industry / government support
 complexity of application software
 other (please specify)

- When deciding to enhance or upgrade your technological capabilities and customer offering, what are the most important motivating factors?

Please rate the selected items in terms of the degree of importance.

(1 = Less important; 5 = Most important)

improves operational efficiency
 improves customer service
 direct customer request
 reduces labor costs
 improves data quality
 clear ROI
 reduce human error
 corporate image
 other (please specify)

- Please rank the following concern areas on an I.T. application:
 Price
 People
 Technology

Section D:

Industry trends/ characteristics

In this section, we ask participants how their industry characteristics will affect their technology application needs in the future.

- What are some hot issues/trends of your industry now? (threats, opportunities, new customer's requirements, etc.)
 For instance, how you perceive the impact of outbound migration of manufacturing from GD to outer provinces?
 How would you see the business loss to the emerging manufacturing countries, such as Vietnam, Indonesia, etc?
 What impact the new labour law has been exerted on your business?
- Do you foresee any micro/macro trends that are going to impact your industry in the future?
- How is this transformation going to affect your business process?
- Do they cast any implications on your technology application needs? If so, what are they and why?
- Do you have any IT strategy to adapt to these changes? If so, what are they?



APPENDIX A

DISCUSSION GUIDE - MANUFACTURING

Section E:

Future I.T. Applications

In this section, we ask participant what their future I.T. strategic plan is.

- In order to cope with future business environment and customer's requirements, what kinds of I.T. solutions your company plans to implement? If NO, why?

Show a list of potential application areas for participant to comment.

- What business applications and how you will automate them with technology in future?

Product design

Sales and marketing / Customer relationship

Purchasing / Supplier relationship

Production planning

Production process control and management

Warehousing & Distribution

Communication with internal & external parties (e.g. Portal Technology and Electronic Document Exchange)

Supply chain track & trace

Supply chain security

Compliance management

Forecasting / Event Management

Business Intelligence

Others

- What do you expect the % of the total cost in your IT adoption?
- What is your current spending (in terms of % and/or absolute amount)?

Section F:

R&D Demand & Aspiration

In this section, we ask participant what industry / government support are needed in IT adoption

- Do you have any expectation for government / R&D Centre in helping the industry in term of short-term & long-term?

Show LSCM's 2008 R&D Roadmap for participant to comment.

- In which areas of LSCM R&D roadmap are you interested in? And what other key technology initiatives would your company are interested?
- Are you interested in participating in R&D projects if such R&D project can resolve your business problems and improve your company competitiveness?
- If government is willing to support 90% over the total cost of such R&D project, are you willing to invest together with other companies within the industry (a consortium) the remaining amount and share the project deliverables? Can you think about the possible themes / topics for such joint R&D project?
- If government is willing to support 50% over the total cost of such R&D project, are you interested to invest the remaining amount and own the IP rights of the project deliverables?
- Do you think the function and long-term goal of the LSCM R&D Centre contributes to strengthening Hong Kong's economic competitiveness? If not, why?



APPENDIX B

ORIGINAL TEXT OF "POLICY OF CHINA RFID INDUSTRY DEVELOPMENT"

中国RFID产业发展政策

原文：中国RFID产业联盟

射频识别（RFID）技术是21世纪最具变革力与核心价值的一项新技术，已得到全球业界的高度重视和各国政府普遍关注。中国因拥有产品门类最为齐全的装备制造业，又是全球信息技术产品最重要的生产加工基地和消费市场，也是世界第三大贸易国，这些都为RFID产业与应用的发展提供了巨大的市场空间和难得的发展机遇，RFID产业必将成为中国信息产业发展和信息技术应用的一个新机遇、新亮点，也将推动国家金卡工程进一步向纵深发展。中国政府各主管部门高度重视RFID技术、产业与应用的发展，并坚持自主创新，共同推动RFID产业与应用的发展。

（一）2007年信息产业发展回顾

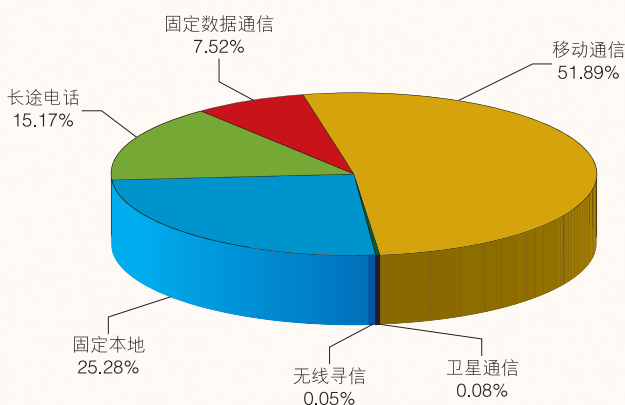
中国信息产业是国家的先导、支柱与战略性产业，是信息技术应用与国家信息化建设的基石，也是推进经济与社会协调发展、构建和谐社会与创新型国家的技术基础与关键所在。中国电子信息产业规模在国内居各工业部门之首，是第一支柱产业；在全球中国IT产业规模仅次于美国，居世界第二位。

信息产业近10年来持续、高速发展，实现了历史性跨越。目前我国拥有全球最为先进的通信基础设施和最多的用户群。当今电子信息产业已发展成为国民经济第一支柱产业和我国产品外贸出口第一大户。更为重要的是，信息技术与信息产业作为当今世界

经济与社会发展的重要驱动力，正以其最广泛的渗透性和加速、倍增作用为我国经济发展、社会进步与百姓生活水平与质量的提高发挥著日益重要的作用。

2007年我国信息产业保持平稳较快增长。通信业务总量完成2万亿元，增长25.6%。通信业务收入完成8580亿元，其中增值业务收入2100亿元，增长25%；固定电话、移动电话用户分别达到3.68亿户和5.46亿户，互联网上网人数超过2亿；通信固定资产投资完成2300亿元。电子信息产业销售收入完成5.6万亿元，增长18%。其中软件业5800亿元，增长20.8%；产品出口完成4500亿美元，增长23.6%，占全国外贸出口总额的比重为37.6%。信息产业增加值占GDP的比重达到7.9%，各项工作取得了新的成绩。

2008年电信业务收入构成



2008年1-2月份，移动通信收入和固定数据通信收入比去年同期分别增长16.1%和55.4%。



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2008年主要电子产品出口情况

产品名称	单位	出口数量(万台)	出口额(亿美元)	出口额同比增长(%)
便携式电脑	台	7302.6	530.9	38.1
移动电话(手机)	台	48341.3	356.0	14.1
集成电路	个	4070731.6	235.4	16.1
液晶显示板	个	187974.8	196.4	51.7
显示器	台	11734.0	181.8	8.1
彩电电视机	台	4788.3	90.1	14.5
数字照相机	台	11042.5	77.7	23.6
激光视盘放像机	台	15039.1	64.6	-9.5
微型计算机	台	874.7	58.5	20.1
打印机	台	3896.6	47.2	-29.9

(二) RFID应用是信息化建设的 重要组成部分

金卡工程是中国信息化建设的四个起步工程之一，1993年在中央领导的亲自倡导和国务院领导的直接指导下，它以电子货币等各类卡基应用为重点启动实施，涉及国民经济发展、社会进步，并直接普惠大众，是一项跨部门、跨地区、跨世纪的庞大社会系统工程，也是我国信息化建设的重要组成部分。15年来金卡工程建设始终得到国家领导同志的关怀、支持和直接指导；各有关部门和地方密切配合、共同努力，勇于探索、大胆实践，做了大量艰苦细致的工作，使金卡工程建设积极稳妥地向前推进，取得了重要进展，成效显著。

金卡工程创新发展所包含的多功能智能卡与RFID电子标签应用，是我国信息化建设的重要组成部分和新的经济增长点。抓住机遇，顺应现代科技发展潮流，深刻把握信息化发展趋势，大力推广使用智能卡和电子标签技术，对于全面贯彻落实科学发展观，建设创新型国家，构建社会主义和谐社会具有十分重要的意义。

(三) 发展RFID产业与应用是贯彻落实 党和国家信息化战略和产业发展 政策的重要举措

本世纪头20年，是中国经济社会发展的重要战略机遇期，也是科学技术发展的重要战略机遇期。党的十五届五中全会把信息化提到了国家战略的高度；党的十六大进一步作出了“以信息化带动工业化、以工业化促进信息化、走新型工业化道路”的战略部署；党的十六届五中全会再一次强调，“推进国民经济和社会信息化，加快转变经济增长方式”。党的十七大报告提出“加快转变经济发展方式，推动产业结构优化升级。这是关系国民经济全局紧迫而重大的战略任务”；要“全面认识工业化、信息化、城镇化、市场化、国际化深入发展带来的新形势新任务”，“坚持走中国特色自主创新道路”和“坚持走中国特色新型工业化道路”，要“大力推进信息化与工业化融合”。要紧紧抓住这一历史性机遇，把推进信息化建设放在重要位置，走新型工业化道路，促进社会生产力的跨越式发展。



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进入21世纪,新科技革命迅猛发展,正孕育着新的重大突破,将深刻地改变经济和社会的面貌。信息科学和技术发展方兴未艾,依然是经济持续增长的主导力量;科学技术应用转化的速度不断加快,造就新的追赶和跨越机会。因此,我们要站在时代的前列,以世界眼光,迎接新科技革命特别是物联网革命带来的机遇和挑战。我们比以往任何时候都更加需要紧紧依靠科技进步和创新,带动生产力质的飞跃,推动经济社会的全面、协调、可持续发展。

(四) 关于《中国射频识别(RFID) 技术政策白皮书》

RFID产业与应用的发展涉及众多行业、部门和地方,是一个庞大的社会系统工程,必须统筹规划、统一认识、分工合作、大力协同,最大限度的实现资源的整合和资金的合理配置。2005年我国科技部会同国家发展改革委员会、商务部、信息产业部、交通部、海关总署、铁道部、公安部、教育部、建设部、农业部、国家质量监督检验检疫总局、国家标准化管理委员会、国家邮政局、国家食品药品监督管理局等15个部委,共同编写了《中国射频识别(RFID)技术政策白皮书》。白皮书由五部分组成,经多次修改已于2006年6月正式出台。白皮书本着科学性、前瞻性和指导性原则,为中国RFID技术与产业未来几年的发展提供了系统性指南。

白皮书指出中国发展RFID技术的总体目标为:通过技术攻关,突破RFID一系列共性关键技术、产业化关键技术和应用关键技术,培养一支与技术研究和产业发展相适应的人才队伍,建立中国RFID技术自主创新体系,取得核心技术的自主知识产权;以自主研发技术为基础,实施竞争前联合战略,通过组织产业联盟、产业基地等企业创新集群,形成联合、协同、掌握自主知识产权技术的产业链,实现自主研制产品占市场主要份额;通过实施示范工程,创新应用模式,带动RFID技术在行业的广泛应用,逐步形成大规模、辐射相关领域的公共应用;通过研究与制定相关的国家标准,形成中国RFID标准体系。

白皮书明确了中国发展RFID产业的总体思路是:企业为主,政府推动,构建产业联盟,形成掌握自主知识产权技术的RFID产业链;通过产业基地建设,发挥群体优势,打造具有国际竞争力的民族品牌;开展国际交流与合作,提高中国RFID产业整体水平。

白皮书还强调发展RFID途径之一是:进一步完善产业政策,积极引入新的融资渠道和模式,建设RFID产业基地,实现技术和产业的汇聚,促进RFID产业链的形成和发展。



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(五) “十一五”国家863计划的 重大专项课题研究内容

2006年9月，科技部发布了“十一五”国家高技术研究发展计划（863计划）先进制造技术领域重大项目“射频识别（RFID）技术与应用”2006年度课题申请指南。明确指出“十一五”期间，本重大项目将结合我国RFID技术及产业化发展现状，从国情出发，坚持自主创新与集成创新相结合，以企业为主体，政、产、学、研、用相结合的自主发展模式，攻克一批RFID共性基础及前瞻性、产业化关键技术和应用关键技术，取得一系列具有自主知识产权、并达到国际同期先进水平的核心技术，建立起我国RFID技术自主创新体系；以示范应用为引导，带动RFID技术在各行业的广泛应用，逐步形成大规模、辐射相关领域的公共应用服务体系；通过研究与制定相关的国家标准，形成我国RFID标准体系；建设RFID产业发展的服务环境；实施RFID技术及产业化战略联盟，通过联合、协同等多种模式，构建具有自主知识产权技术的产业链。

(六) “三部一局”确定的应优先发展 的高新产业重点领域

2007年1月，国家发展改革委、科技部、商务部、国家知识产权局联合修订发布的《当前优先发展的高技术产业化重点领域指南（2007年度）》中，指明了无线射频识别技术（RFID）是信息产业优先发展的重点之一。它包括：超高及高频芯片、标签、读写器，快速低成本标签封装设备，应用系统集成、实时管理及中间件产品，分布式无线射频编码解析服务系统软件、编码解析安全管理系统软件及公共信息服务体系，无线射频（RFID）测试，RFID与移动通信、传感技术、生物识别等技术的融合，行业及区域应用示范。



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