JAPAN INTERNATIONAL COOPERATION AGENCY
PENANG DEVELOPMENT CORPORATION

STUDY
ON
STRENGTHENING SUPPORTING INDUSTRIES THROUGH TECHNOLOGY TRANSFER IN MALAYSIA

FINAL REPORT

FEBRUARY, 2001

THE MATERIALS PROCESSING TECHNOLOGY CENTRE
SHINKO RESEARCH CO., LTD.

PREFACE

In response to a request from the Government of Malaysia, the Government of Japan decided to conduct the Study on Strengthening Supporting Industries through Technology Transfer in Penang and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Malaysia a study team headed by Mr. Michifumi Abe of the Materials Process Technology Center and constituted by members of the Center and Shinko Research Co., Ltd., four times from February 2000 to January 2001.

The team held discussions with the officials concerned of the Government of Malaysia and conducted related field surveys. After returning to Japan, the team conducted further studies and compiled the final results in this report.

I do hope that this report will contribute to the promotion of supporting industries in Malaysia and to the enhancement of amity between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of Malaysia for their close cooperation throughout the study.

February, 2001

Kunihiko Saito
President
Japan International Cooperation Agency

February, 2001

Japan International Cooperation Agency
Kunihiko Saito, President

LETTER OF TRANSMITTAL

The Final Report for the Study on Strengthening of Supporting Industries in Malaysia Through Technology Transfer (the Study) has now been completed and is herewith submitted.

The Report describes the current situation of supporting industries for the electrical and electronics industries in the State of Penang in Malaysia as well as the business environment for supporting industries and puts forward recommendations to strengthen supporting industries based on the analysis results of identified problems faced by supporting industries.

The Study Team, consisting of three groups responsible for promotion policies, company diagnosis, information and distribution respectively, conducted four field surveys which commenced in February, 2000, analysed the actual state of supporting industries and identified the key issues to strengthen these industries. The analysis results indicate that many companies in supporting industries are, in fact, operating as subcontractors of large companies and that the strengthening of supporting industries requires a shift towards high value-added production, the advancement and higher precision of processing technologies, diversification of the product range, a positive response to the need for international operation through the use of IT and the promotion of business management modernisation through the introduction of scientific business management techniques.

While it is judged that many of the identified problems can likely be solved by the self-help efforts of companies, guidance and improvement of the business environment by the Penang Development Corporation (PDC) are judged to be necessary to solve some problems in view of the fact that many companies operating in supporting industries are SMIs. From this viewpoint, the problems are summarised, strategies to solve them are formulated and programmes to implement such strategies are recommended.

Firstly, the development of production engineering and the establishment of a travelling guidance unit are recommended as programmes to provide guidance on a shift towards highly value-added production and the advancement of processing technologies. The materialisation of these programmes designed to (i) promote new measures for the maintenance of quality and cost reduction by examining the shapes of parts which can be easily processed and an

efficient assembly method in view of the available machinery and processing (machining) technologies of SMIs and (ii) to improve technologies and skills through OJT is expected to achieve an increase of the productivity and enhancement of the design and product improvement techniques, thereby resulting in high added value for products.

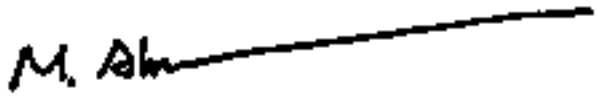
Secondly, the establishment of two committees to promote technological advancement and an increase of the local content is recommended. These committees are expected to (i) establish a clear understanding of the technological as well as market trends of final products, (ii) to provide advice on the diversification of and market expansion by supporting industries based on accurate information on the prospect of new markets for technologically advanced products and on the products required by multi-national companies (MNCs), (iii) to guide SMIs in the right direction, (iv) to indicate the desirable direction for supporting industries promotion policies and (v) to provide guidelines for business development for the owners/top management of SMIs.

The establishment of a joint materials procurement system is also recommended to increase the unit order size to eliminate the handicap suffered by SMIs at the materials procurement stage. It is hoped that the subsequent development of this system will facilitate business cooperation between SMIs in the technical field in the form of the joint development of technologies or the division of work to develop new technologies.

The programme to strengthen corporate management education for the modernisation of management will provide the opportunity for SMI owners and executives to learn management techniques and strategies and scientific business management techniques. SMI owners and executives participating in this programme are expected to exercise strong leadership in the development of their businesses. Meanwhile, the introduction of a management consultant system is expected to achieve the rational and transparent evaluation of company strength and to put forward guidelines for the efficient utilisation of managerial resources.

As the electrical and electronics industries are closely linked to the international economy, their supporting industries are exposed to severe international competition. As the labour cost in Malaysia is higher than that in neighbouring countries, productivity improvement and the maintenance of highly value-added production corresponding to the high labour cost are compulsory requirements to survive amidst the international competition. It is greatly hoped that the strategies and programmes recommended in this report will be put into practice as soon as possible under the guidance of the PDC.

Finally, I would like to express my utmost gratitude to the Ministry of Foreign Affairs, the Ministry of Economy and Industry and the Japan International Cooperation Agency for their guidance and assistance for the implementation of the Study. I would also like to thank the PDC for its assistance for the Study and the many companies and organizations in Malaysia which cooperated with the field surveys.



Michifumi Abe
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Study Team for the Study on Strengthening Supporting Industries through Technology Transfer in Malaysia

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ABBREVIATION

ABS	Acrylonitrile Butadiene Styrene Resin
ARGI	Institute of Manufacturing ARGI
ASEAN	Association of South East Asian Nation
ASTM	American Society for Testing and Material
AV	Audio and Visual
BDIM	Bank Development & Infrastructure Malaysia Bhd.
(BPIM)	(Bank Pembangunan & Infrastruktur Malaysia Bhd.)
Bhd.	Berhad
BITMB	Bank Industri & Technologi Malaysia Bhd.
BN	Bank Negara
BPIM	Bank Pembangunan & Infrastruktur Malaysia Bhd
(=BDIM)	
BTEC	The Business & Technical Education Council
BTVC	Bumiputera & Technology Venture Capital Bhd.
BWCT	Butter Worth Container Terminal
C/P	Counter Part
CAD/ CAM	Computer Aided Design/Computer Aided Manufacturing
CGC	Credit Guarantee Corporation Malaysia Bhd.
CIF	Cost, Insurance and Freight
CNC	Computerised Numerical Controller
COE	Centre of Excellence
CPI	Consumer Price Index
CRDF	Commercialisation of R&D Fund
DHL	DHL Worldwide Express (Dalsey, Hillblom & Lynn)
DIN	Deutsches Institut fur Normung
E&E	Electric & Electronics
EAC	Entrepreneur Assistance Centre
EDU	Entrepreneur Development Unit
EPF	Employee Providence Fund
EPU	Economic Planning Unit
FMM	Federation of Malaysian Manufacturers
FOB	Freight on Board
FSMI	Fund for SMIs
FTZ	Free Trade Zone
GDP	Gross Domestic Product
GSP	Global Supplier Programme

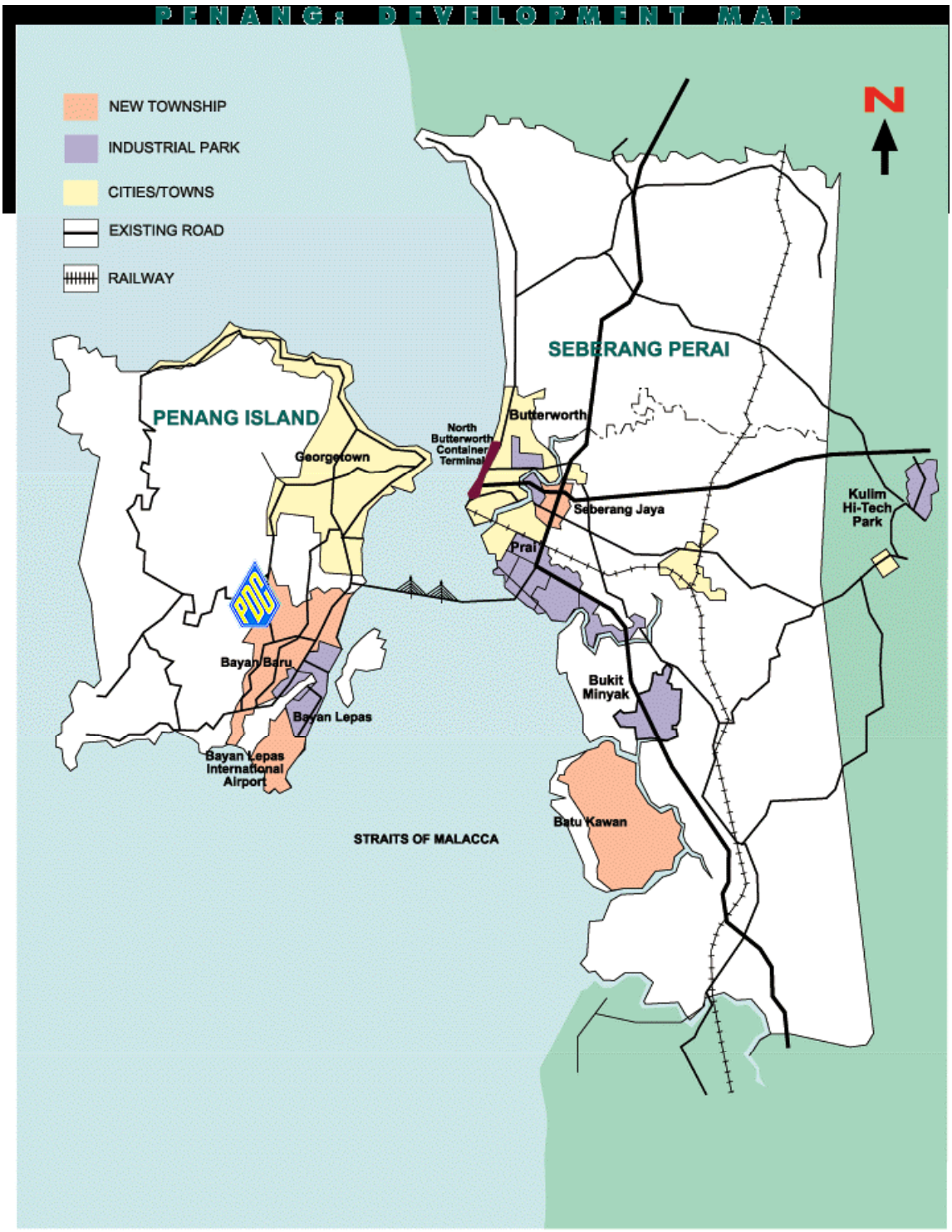
HDD	Hard Disk Drive
HRD	Human Resources Development
HRDC	Human Resources Development Council
HRDF	Human Resources Development Fund
ICC	Inovation Consultancy Centre
ILP	Industrial Linkage Programme
IMP	Industrialisation Master Plan
IMP2	Second Industrialisation Master Plan
IPC	International Procurement Center (=IPO)
IPM	Institute of Precision Moulds
IPO	International Procurement Office
ISO	International Organization for Standard
IT	Information Technology
ITAF	Industrial Technical Assistance Fund
JACTIM	Japanese Chamber of Trade & Industry, Malaysia
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standard
JIT	Just In Time
JMTI	Japan Malaysia Technical Institute
JV	Joint Venture
KL	Kuala Lumpur
KLIA	Kuala Lumpur International Airport
KTPC	Kulim Technology Park Corporation Sdn. Bhd.
LMW	Licenced Manufacturing Warehouse
MARA	Majilis Amanah Rayat
MAS	Soft Loan Scheme For Modernization & Automation
MDC	Multimedia Development Corporation
MECIB	Malaysian Export Credit Insurance Bhd.
MIDA	Malaysian Industrial Development Authority
MIDF	Malaysian Industrial Development Finance Bhd.
MITI	Ministry of International Trade and Industry
MNCs	Multi National Companies
MOED	Ministry of Entrepreneur Development
MOF	Ministry of Finance (Treasury)
MOHR	Ministry of Human Resources
MOSTE	Ministry of Science, Technology & Environment
MSC	Multimedia Supercorridor

MTDC	Malaysian Technology Development Corporation
MVCC	Malaysia Venture Capital Corporation
NBCT	North Butter Worth Container Terminal
NEAP	National Economic Action Council
NPC	National Productivity Corporation
NVTC	Nationl Vocational Training Council
PAKSI	Financial Package for Small & Medium Industries
PC	Personal Computer
PC	Poly-carbonate
PCB	Printed Circuit Board
PDC	Penang Development Corporation
PERDA	Penang Regional Development Authority
PIA	Promotion of Investment Act (1986)
PIKS	Small and Medium Industry Centre (Pusat Industri Kecil dan Sederhana)
PMMA	Poly-methyl methacrylate acid
PP	Poly-propropylene
PR	Public Relation
PSDC	Penang Skill Development Centre
PTTC	Plastic Technology Training Centre
QA	Quality Assurance
R&D	Research and Development
RM	Ringgit Malaysia (1998.9~ 1us$=3.8RM)
S$	Singapore Dollar
S/C	Steering Committee
SCM	Supply Chain Management
Sdn. Bhd	Sendirian Berhad (=Private Limited)
SI	Supporting Industries
SIRIM	SIRIM Bhd. (former Standard & Industrial Research Institute of Malaysia)
SMI, SMIs	Small & Medium size Industries (=Small & Medium size Enterprises)
SMIDEC	Small & Medium Industries Development Corporation
SSP	Service Supplier Programme
TAF	Technology Acquisition Fund
TDP	Technology Development Programme
TPM	Total Pre Maintenance
TQM	Total Quality Management

TSP	Time-Sector Privatisation
UPM	Universiti Putra Malaysia
USM	Universiti Sains Malaysia
VC	Venture Capital
VDP	Vender Development Programme

Source: MIDA Home Page

Map of Malaysia



Source: PDC Home Page

Map of State of Penang

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

Outline of the Study

Background

The State of Penang and its neighbouring area in Malaysia is an area with a high industrial concentration together with the Kuala Lumpur and Johor Bahru area. The electrical and electronics industries in this area play the most important role in the state and their development owes much to MNCs (multi-national companies).

These MNCs, however, are companies which are linked to the international economy and which can easily opt for country hopping if their operation is disrupted by a worsening of the business conditions, a sharp rise of the cost and/or weak supporting industries (SI) responsible for supply, machining and subcontracted work in regard to materials and parts. A sense of crisis regarding a possible decline of local industrial activities has made the Penang Development Corporation (PDC) recognise that the development of the capability of local companies to supply parts to MNCs is an urgent necessity. Under these circumstances, the implementation of the Study on Strengthening of Supporting Industries in Malaysia Through Technology Transfer has become a pressing agenda.

Objectives of the Study

The Study intends to achieve the following two objectives to promote SI in Penang.

(1) Improvement of the competitiveness of SI companies through the direct transfer of technologies/techniques

(2) Recommendation of promotion measures for SI companies to be implemented by the PDC and other SI-related organizations

Study Activities

To achieve these objectives, various activities were conducted under the Study. Firstly, a survey on the market needs of SI companies was conducted to establish the business environment for SI companies. Concrete problems originating from internal factors of SI companies were then identified by means of the diagnosis of and technology transfer to individual SI companies to identify the causes of the failure of these companies to meet market needs while problems originating from external factors were analysed through a visit

survey to implementation organizations of SMI support programmes and a survey on physical distribution. Refer to Fig. 1-1 in the main text for the flow of the Study.

Problems Identified by the Study and Problems to be Solved

Needs of MNCs

Firstly, the reference survey found that there is a general shortage of such SI as parts and processing service industries (precision machining, precision stamping, precision plastic processing, heat treatment, electrical and electronic parts and plating), materials industries (resin materials, metal materials and chemicals) and other industries (industrial waste treatment, jigs, press dies, plastic dies and automation machinery) to support the operation of MNCs.

Many MNCs cited “quality” as a factor hampering their procurement from local companies. MNCs were also critical of local SI companies, citing their insufficient product improvement capability, including design capability, insufficient precision machining (in the order of 1 micron) and surface treatment (surface roughness) capability, weak sense of obligation to meet the agreed delivery date, inability to handle engineering plastics if not common resins for moulding operation and insufficient technical as well as control capability to meet mass production needs even if the trial products are good. Nevertheless, there is strong willingness on the part of MNCs to procure from local companies if possible.

Problems Found by Company Diagnosis

The company diagnosis was conducted by four machining experts, two production control/management experts and two business management experts to identify the existing problems. Advice was provided on immediate solutions while the types of assistance required by companies were clarified by means of interviews.

Most of the SMIs diagnosed (79%) are young as they were established in or after 1990 and the majority have a subordinate relationship with MNCs as subcontractors for processing work. Some 30% of the founders are ex-employees of MNCs and conduct their business based on the expertise and management knowledge acquired during their period of employment at MNCs.

This fact-finding survey on SMIs in SI identified as many as 119 problems. The largest category of problems is the necessity for support by related organizations (approximately 19%), followed by the improvement of production control (approximately 17%) and education/training on technologies and skills (approximately 14%). In contrast, the low level

of problem awareness is reduced with the improvement of quality control (approximately 8%) and the improvement of floor control (approximately 5%), illustrating the gap between SMIs and MNCs which point out that “quality” is the biggest problem.

According to the analysis results of the diagnostic scores, the ratio of SMIs which have reached the level (excellent) required by MNCs is quite low, i.e. 24% in terms of processing, 14% in terms of production control and 15% in terms of management control out of the 103 SMIs diagnosed, illustrating the validity of the above-mentioned demands on the part of MNCs.

- **Business Management Problems to be Solved**

  As described earlier, there is a slight gap between SI and MNCs in terms of their awareness of pressing problems, highlighting the undue satisfaction with the present situation on the side of SI. The Study Team believes that this is a problem relating to the managerial attitude of SMI owners and, therefore, has made the provision of educational/training opportunities the first recommendation on the grounds that it will be essential for SI to change their business attitude to gain the trust of MNCs by means of increasing the opportunities to learn scientific business management techniques (particularly management accounting techniques) and fostering a modern sense of business management.

- **Technical Problems to be Solved**

  Some 74 problems (62%) out of the 119 identified problems are related to technology and 40 are judged to be problems which can be solved by the self-help efforts of SMIs. For each problem, the present situation and improvement method(s) were explained to the relevant SMIs at the time of the detailed diagnosis. Meanwhile, the remaining 34 problems are judged to require some kind of external assistance although most of them can be improved by the use of the existing support programmes and/or support facilities, such as the Penang Skill Development Centre (PSDC), etc. However, new support policies and facilities will be required to solve the problems relating to production engineering described below.

  Analysis of the identified problems indicates that the level of awareness of problems on the part of SI is rather low when it comes to the necessary improvement of quality control and floor control, both of which are key ingredients of production. This situation is judged to be the result of the fact that SMIs are not fully aware of the importance of production engineering because of their status as subcontractors of MNCs and the fact that their production activities follow the instructions given by MNCs.

The insufficient allocation of the necessary resources and other difficulties are expected to pose a challenge for SI, dominated by SMIs, because of their shortage of highly skilled leading engineers and weak financial strength. Given the fact that most SMIs are less likely to enjoy the benefits of the VDP (Vendor Development Programme) and the ILP (Industrial Linkage Programme) designed to facilitate technology transfer from MNCs, there is a limit to the improvement of the technological strength of SMIs based on self-help efforts. This situation points out the necessity to consolidate a joint operation function through which guidance is given on R & D on production engineering suitable for SMIs and personnel is dispatched to analyse the causes of damage encountered in manufacturing processes and for consultations to solve problems on site.

- **Problems Relating to Securing of Markets**

The questionnaire survey conducted at the same time as the company diagnosis found that some 26% of the visited SMIs hope for some form of government assistance. The most frequently requested support is the introduction of business contacts. However, the problem of securing markets should be solved by self-help efforts on the part of SMIs and the role of support programmes should be restricted to indirect support for improvement of the business environment for business expansion, particularly the provision of information on technologies and markets. Given the fact that SMIs are in a weak position in terms of obtaining information on technologies and markets, the formulation of guidelines for the strengthening of SMIs from a long-term perspective and for the provision of guidance as well as advice on the improvement of the technological level is judged necessary so that SMIs can improve their technological level and improve their business strength to trade overseas should MNCs withdraw from Malaysia. The utilisation of IT as a tool to support these activities is also judged necessary.

Problems of SMI Support Programmes

A survey was conducted on two aspects of SMI support programmes, i.e. (i) 19 government (federal and state) bodies and related organizations which implement SMI support programmes and (ii) 103 SMIs which are the beneficiaries of such measures. As a result, three areas of mismatch were observed as listed below.

① While policy planners believe that sufficient support programmes are in place, the recipients of these programmes fail to fully utilise them because of their lack of a proper understanding of the programmes.

② There is no clear division of the roles to be played by the federal and local governments, resulting in the disparity of their efforts to promote support programmes.

③ Support programmes appear to primarily focus on such advanced technologies as IT and biotechnology and support for SMIs which are hidden contributors to exports is inadequate.

These mismatches are judged to be the inevitable outcome of the facts that (i) the history of SMI promotion policies in Malaysia is short, (ii) the activities of the SMIDEC (established in 1996), which is the central organization for the promotion of SMIs, are still at the infancy stage and (iii) industrialisation in Malaysia has primarily focused on export-oriented large companies.

Supporting Industry Promotion Strategies and Action Programmes to be Adopted by the PDC

The Study Team recommends the following four strategies and seven action programmes. Although companies belonging to the electrical and electronics industries are quite diverse in terms of the business type as well as size, the target companies here are restricted to SMIs because of the restriction of the targets to local companies.

Strategy 1:

Assistance for production engineering activities to increase the added value of products and to efficiently use the managerial resources of a company

The objective of this strategy is to promote "manufacturing ++" among SMIs by means of introducing a series of voluntary production engineering activities relating to (i) the examination of the machinery and processing technologies in possession, shapes of products for easy machining and easy assembly methods and ways of maintaining the quality and reducing the cost while preserving the functions and shapes of the final products to reflect the examination results on product planning and design in the upstream and (ii) the possible introduction of new processing/machining technologies and machinery to rationalise production.

Strategy 2

Promotion of diversification of the production activities and consolidation of the various services of SI to meet the diverse needs of MNCs and large local companies in Penang and its surrounding area

The survey on the needs of MNCs found a lack of many types of supporting industries. The objective of this strategy is to reinforce the activities of MNCs by developing many different

types of supporting industries to rectify this weakness so that Penang can become a major production base for MNCs.

Strategy 3

Active promotion of the use of IT by SMIs and assistance for the application of IT to customer development, access to market and technological information and procurement of materials, etc.

The use of IT is now rapidly spreading in the manufacturing sector with the arrival of an age in which information exchange and trading on a global scale have become viable due to the shrinking barriers posed by geographical distance. In such a changing world. SMIs must actively use IT to acquire new customers, to gain access to market and technological information and to efficiently procure materials. The objective of this strategy is the development of the necessary environment by the PDC for the active use of IT.

Strategy 4

Strengthening of the education system for SMI owners in regard to modern business management techniques together with the promotion of management rationalisation for the purposes of securing the trust of large corporations and banks as equal business partners and expanding trade opportunities

Some SMIs have gained the trust of large corporations by absorbing new knowledge, continuing improvement efforts and employing modern management techniques to ensure efficient as well as transparent management with self-help efforts for survival. Because the success or failure of a SMI depends on its owner, education to improve the business capability of owners is an important issue. The present efforts to achieve human resources development, however, are biased towards technologies and skills and there is few opportunity for company owners to learn modern business theories. The objective of this strategy is the provision of opportunities for active learning and the development of an environment for life-time learning by business owners by the PDC.

Action Programmes

The implementation of seven action programmes is recommended to materialise the four strategies designed to strengthen SI by the PDC. The relationship between the strategies and the action programmes is shown in the table below.

Table S-1 Divided Roles for Strategies and Action Programmes

Action Programme		Strategy				Division of Responsibility	
		1	2	3	4	Planning and Coordination	Implementation
AP1	Production Engineering R & D Unit	○				PDC	PSDC-IPM
AP2	Travelling Guidance Unit	○				PDC	PSDC-Guidance Unit
AP3	Technology Advancement Advisory Committee	○	○			PDC	USM
AP4	Council for Improvement of Local Content		○	○		PIKS	DCT (Technology) Penang Net (IT)
AP5	Supply Chain Management System		○	○		PIKS	Penang Net
AP6	Strengthening of Business Management Education				○	PIKS	PSDC-COE (Education)
AP7	Management Consultant System			○	○	PIKS	DCT

AP1: Production Engineering R & D Unit

This unit aims at scientifically solving the production engineering-related problems encountered by SMIs on the production floor and at providing guidance and advice for the improvement of technological strength and the introduction of new production engineering.

AP2: Travelling Guidance Unit

It is difficult for the employees of SMIs to visit the PSDC and other educational/training bodies for guidance because of constraints in terms of time and money. In order to overcome these constraints, technical advisors will visit the production floor to provide guidance on skill improvement and new technologies by means of OJT.

AP3: Technology Advancement Advisory Committee

This committee aims at assisting SMIs to grow into good partners for MNCs by departing from their subcontractor status through the establishment of their own technologies and the development of highly value-added production activities. To achieve this objective, the committee will submit reports to the PDC in response to requested advice. A technology guidance map is included here as an example of a guideline for the development of new products.

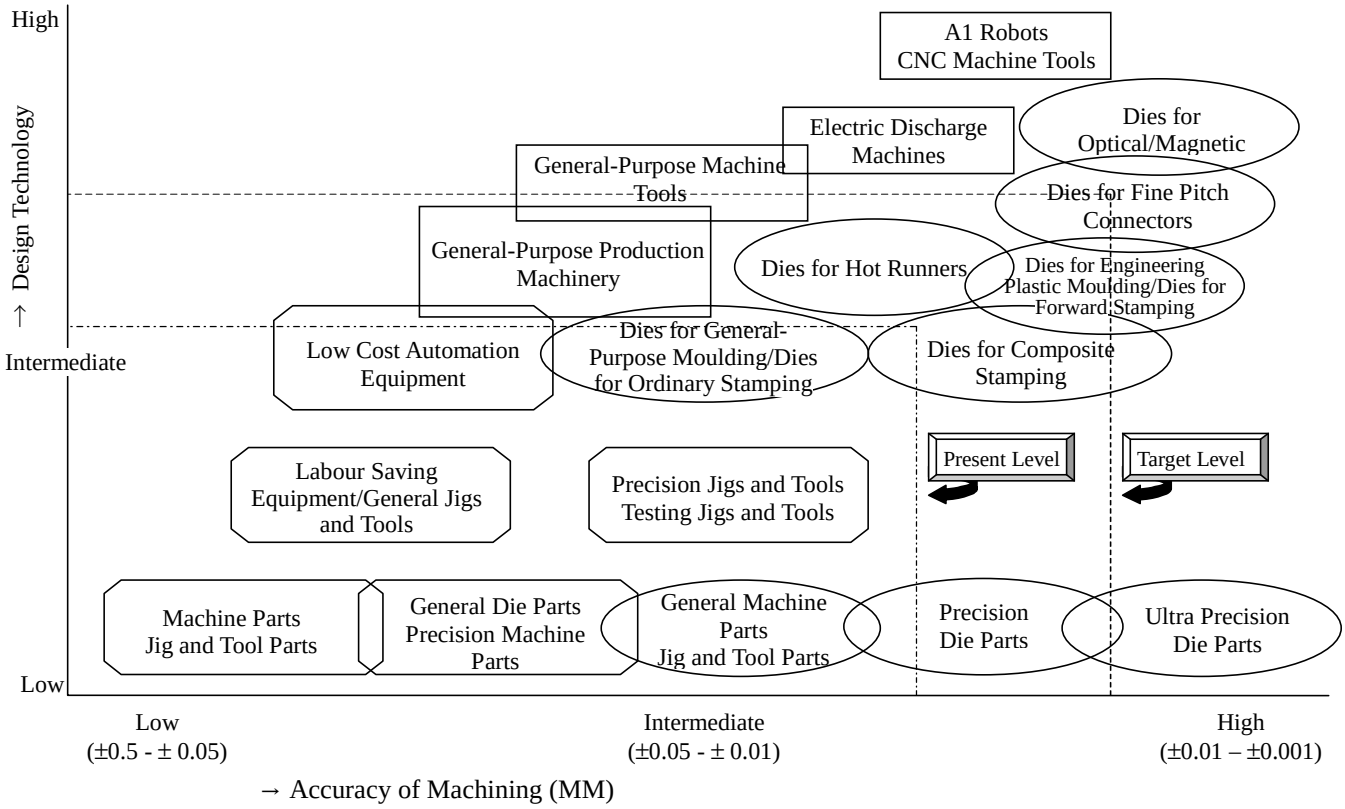


Fig. S-1 Technological Linkage Map for SI Companies (Machining) in Malaysia

At present, local manufacturing companies of metal dies which require integrated machining technologies are at the intermediate level. The local procurement ratio of such dies is less than 30% as many are imported from Taiwan and Hong Kong. With improvement of the machining precision to the level of 5μ to 1μ , a large proportion of general-purpose moulding and press dies can be locally procured (target: more than 70%). It is also shown that the scope of local procurement can be extended to include dies for engineering plastic moulding, precision stamping and composite/forward stamping.

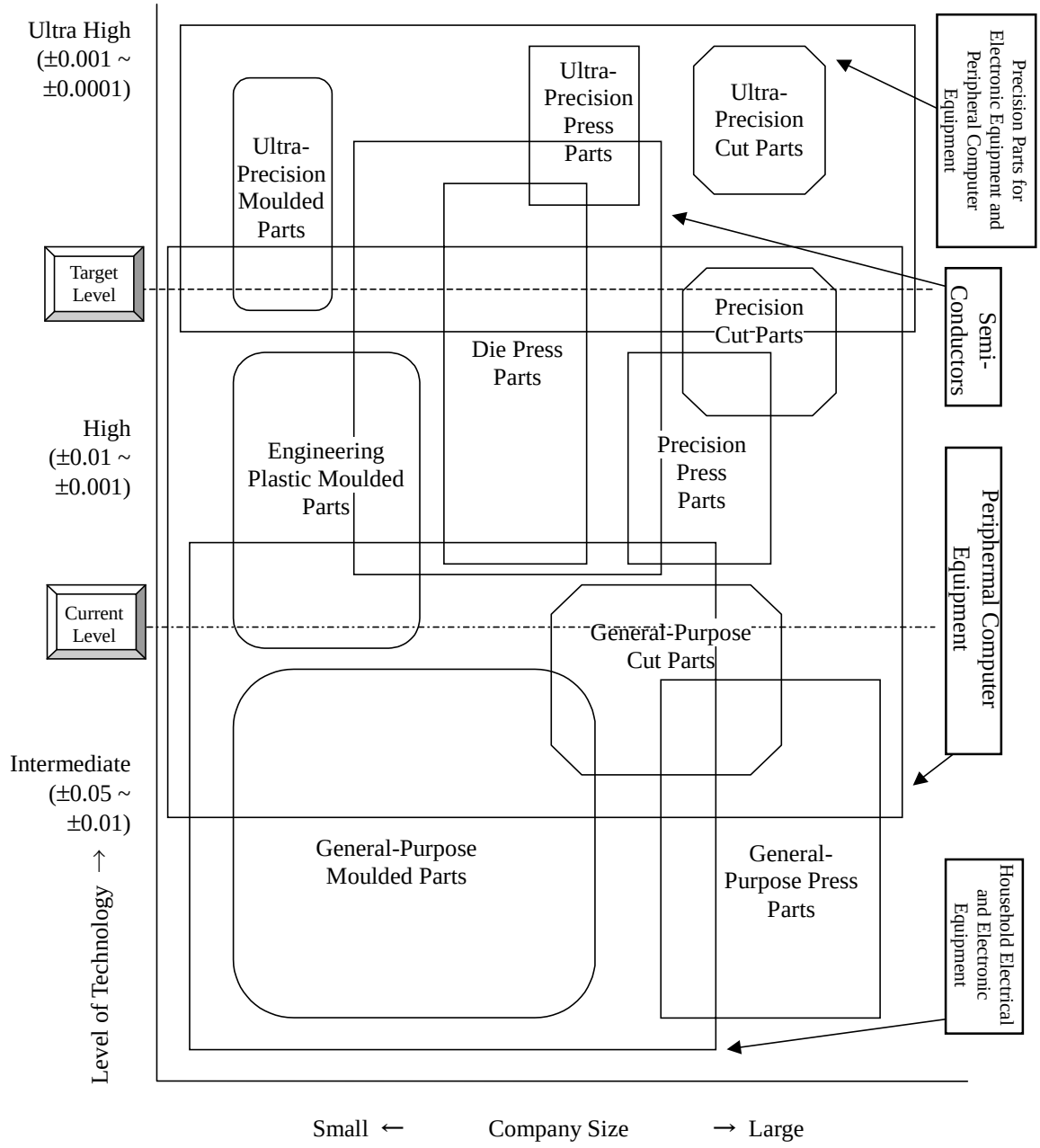


Fig. S-2 Linkage Map of SI Parts

Most general-purpose moulded, stamped and cut parts are currently supplied locally. In the case of moulded engineering plastic parts, these are produced by a small number of companies despite a low level of precision. High precision moulded engineering plastic, precision stamped and precision cut parts are either imported or supplied by MNCs. With the improvement of the precision machining level to 5μ to 1μ, the local supply of parts for audio equipment and peripheral computer equipment (moulded, stamped and cut parts) will become possible.

AP4: Council for Improvement of Local Content

This council aims at intensifying information gathering activities to accurately identify the needs of MNCs, to develop production activities in accordance with changing needs and to manufacture new products locally in order to increase the trading opportunities with MNCs.

AP5: Supply Chain Management System

When SMIs try to procure materials, particularly raw materials, they often suffer unfavourable treatment in terms of the price and delivery terms because of the small procurement unit. The establishment of this system (for the joint procurement of raw and other materials) is recommended to eliminate such disadvantage.

AP6: Strengthening of Business Management Education

This AP aims at the diffusion of scientific business management techniques so that SMI owners can understand the advantages and shortcomings of their companies and can effectively employ their managerial resources in accordance with a clear business strategy for the future.

AP7: Management Consultant System

This system aims at improving the efficiency, accuracy and transparency of company diagnosis through standardisation.

Implementation Schedule

It has already been decided by the Steering Committee that the action programmes will be implemented in accordance with their priority under the guidance of the Bureau of Industry and Trade, which is the section of the PDC responsible for industrial policies, taking the available human resources, equipment and funding for input into consideration. The detailed implementation schedules will be established one by one based on consultations with the designated implementation organizations.

A tentative implementation schedule prepared by the Study Team is shown in Fig. S-3 as reference material for the preparation of the detailed implementation schedules.

Action Programme		Activities	Implementation Schedule (by Year)					Remarks
			1st	2nd	3rd	4th	5th	
AP1	Production Engineering R & D Unit	Development of Teaching Materials	● →		Annual compilation of improvement examples			Handbook and manual, etc.
		Extension of Techniques	←	Phase 1 Themes Dies; Plastics →		← Phase 2 Themes (Undecided) →		Seminar and workshop
		Technical Consultation	←	→		←	→	
AP2	Travelling Guidance Unit	Development of Teaching Materials	● →		Annual compilation of improvement examples			Handbook and manual, etc.
		Planning and Procurement of Guidance Equipment	● →					Preparation and equipment planning: 8 months
		Travelling Guidance		←	→			Selection of guidance theme every 4 months
AP3	Technology Advancement Advisory Committee	Theme Selection, Research and Analysis		● ↔	Theme selection and preparation of technology map, etc.			Preparation for establishment of committee and selection of members: 6 months
		Reporting on Strategy and Follow-Up			● Compilation of committee report in every 2 years			
AP4	Council for Improvement of Local Content	Development of Information Gathering System		Preparation				Use of e-Niaga assumed
		Establishment of Hypothetical Market and Operation	● F/S	●	←	→		F/S on market size and cost-benefit analysis
AP5	Supply Chain Management System	System Development and Operation		●	← Starting with special steels and extending to jigs and others →			Use of e-Niaga assumed
		Creation of Sub-System Database	← Preparation →		Input of price list and data on standards			Search and account settlement sub-system
AP6	Strengthening of Business Management Education	Development of Activity Base and Teaching Materials	● Preparation ●					Introduction of club room; consolidation of reference room
		Education and Exchange		←	→			Overseas study tour once a year
AP7	Management Consultation System	Standardisation of company diagnosis		● Preparation ●	Swift preparation of index database			Trial diagnosis period by DCT to prepare for full-scale implementation
		Diagnosis Activity	←	Trial by DCT →	←	Full-scale implementation →		

Fig. S-3 Detailed Action Programme Implementation Schedule

CHAPTER 1

OUTLINE

CHAPTER 1 OUTLINE

1.1 Background and Progress of the Study

The State of Penang and its neighbouring area in Malaysia is an area with a high industrial concentration together with the Kuala Lumpur and Johor Bahru areas. The electrical and electronics industries in this area play the most important role in the state and their development owes much to MNCs (multi-national companies). While MNCs account for only 13.3% of companies which have been established in industrial parks in Penang, they account for 61.5% of the number of employees.[1]

The electrical and electronics industries, however, are industries which are linked to the international economy and which can easily opt for country hopping if their operation is disrupted by a sharp rise of the cost and/or weak supporting industries (SI) responsible for supply, machining and subcontracted work in regard to materials and parts. In fact, the signs of such country hopping have already appeared among MNCs operating in Penang.[2] A sense of crisis regarding a possible decline of local industrial activities has made the Penang Development Corporation (PDC) recognise that development of the capability of local companies to supply parts for MNCs is an urgent necessity. The PDC has traditionally been very active in promoting inward investment by MNCs and the transfer of technology from MNCs to local companies. However, local technologies have not yet reached the level of generally satisfying the needs of MNCs. Under these circumstances, the Penang State Government made a request to the Government of Japan to conduct the Study on Strengthening of Supporting Industries in Malaysia Through Technology Transfer in the belief that improvement of the technological strength of supporting industries for the electrical and electronics industries is the biggest task faced by the state.

In response to this request, the Japan International Cooperation Agency (JICA) sent the Preliminary Study Team to Malaysia in October, 1999 and concluded the Scope of Work (S/W) for the implementation of a full-scale study on 4th November, 1999 with the Penang Development Corporation (PDC).

1.2 Outline of the Study

The Study intends to achieve the following two objectives to promote SI in Penang.

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1 As of June, 1999 based on PDC statistics.

2 According to PDC statistics for June, 1999, of the 748 factories operating in 1995, 33 had closed down by 1999.

(1) Improvement of the competitiveness of SI companies through the direct transfer of technologies/techniques

(2) Recommendation of promotion measures for SI companies to be implemented by the PDC and other SI-related organizations

To achieve these objectives, various activities were conducted under the Study. Firstly, a survey on the market needs of SI companies was conducted to establish the business environment for SI companies. Concrete problems originating from internal factors of SI companies were then identified by means of the diagnosis of and technology transfer to individual SI companies to identify the causes of the failure of these companies to meet market needs while problems originating from external factors were analysed through a visit survey to implementation organizations of SMI support programmes and a survey on physical distribution. Refer to Fig. 1-1 for the flow of the Study.

1.2.1 Survey on Needs of MNCs

The survey on the needs of MNCs was conducted in two ways, i.e. a reference survey and a visit survey to MNCs.

The reference survey used the results of the separate questionnaire surveys conducted in FY 1999 by the JACTIM (Japanese Chamber of Trade and Industry, Malaysia) and the Sansui-Kai (social forum for Japanese manufacturing companies mainly operating in Penang) and identified “what Japanese MNCs want from SI”.

The subject companies of the visit survey were 15 large companies located in Penang and its neighbouring area, i.e. 10 Japanese companies, three European or American companies and two large local companies, 4 companies located in Singapore, i.e. two Japanese companies and one large local company, which procure parts from Malaysia, and one Japanese company which sells its products to Malaysia. These 19 visited companies can be classified by business type as follows.

- Assembly (electronics) .....(6) : Sony, Sharp, Canon, Jurong-Hitech, Toshiba and Sanyo
- Semiconductors .....(3) : Hitachi Semicon, OSRAM and Agilent
- Materials .....(3) : KCMA, KOMAG and KLS
- Machining of parts.....(5) : KPTech, Kasatani, KPM, Souritsu and ENG
- Machinery/dies .....(2) : TOWAM and LKT

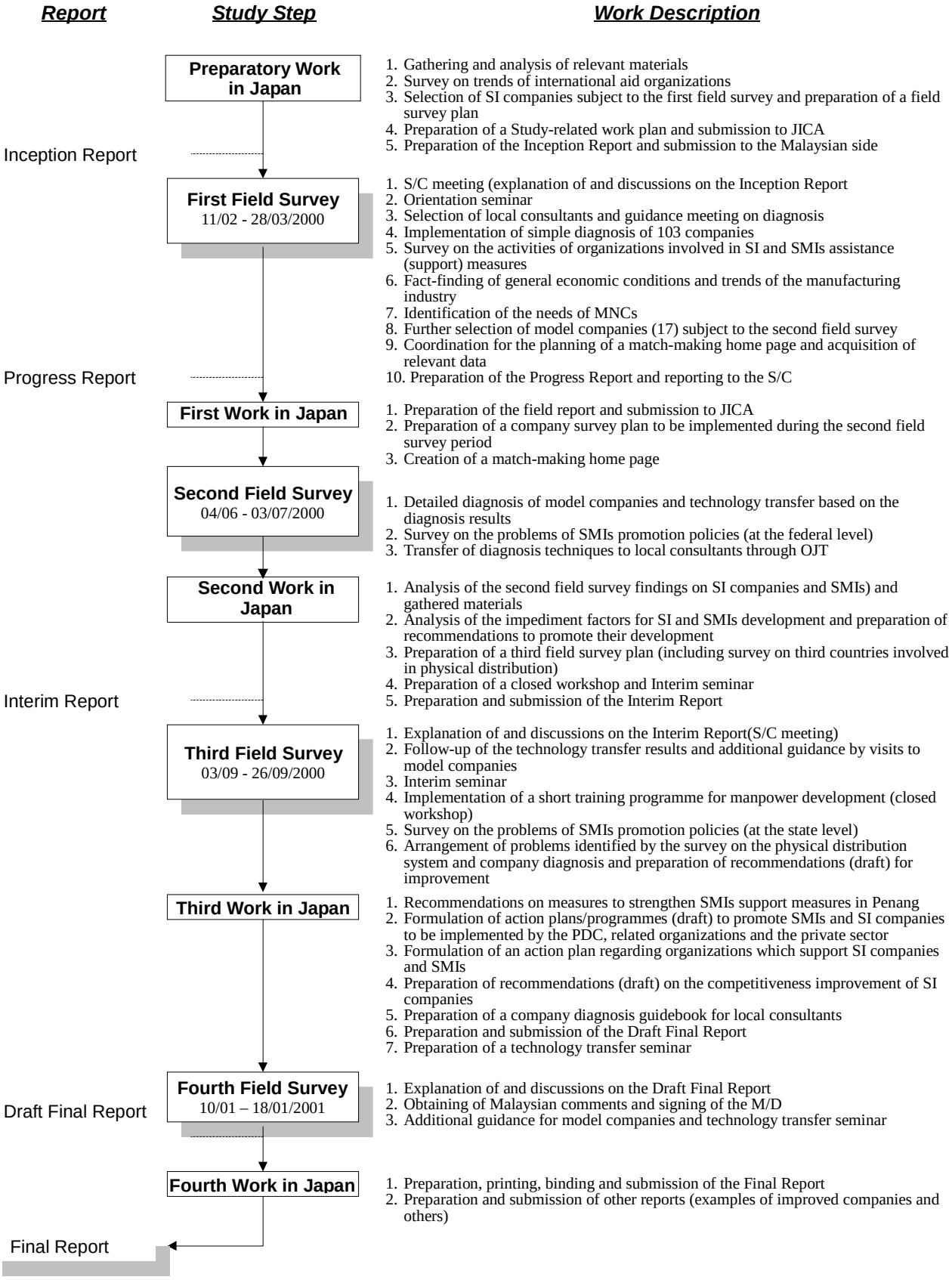

Fig. 1-1 Study Flow

In addition, MNC booths at the SMIDEX 2000 (a trade fair targeting SI companies) held in Kuala Lumpur in September, 2000 were visited to clarify which items MNCs want to procure locally.

1.2.2 Visit Survey to SI Companies

SI companies of various business types in Penang were visited. After clarifying the common problems of these companies, model companies were selected for more detailed analysis of the managerial and technical problems faced by these companies, following by the provision of advice on measures to solve the problems and the transfer of the necessary techniques/technologies/skills required for the implementation of such measures.

(1) Simple Diagnosis

A total of 103 companies[3] out of the SI companies registered with the Small and Medium Industry Centre (PIKS) of the Penang Development Corporation (PDC) were selected for simple diagnosis[4] to analyse the present conditions of SI in Penang and its neighbouring area in order to identify the problems impeding the strengthening and development of SI.

A large number of the selected companies belong to three business types, i.e. machining (16 companies), pressing (16 companies) and the manufacture and assembly of electrical and electronic parts (15 companies), for which a new business can be established with an intermediate technology level. The industries with the smallest number of companies diagnosed are die manufacturing (4 companies) and engineering (3 companies), both of which can achieve a high level of added value while requiring relatively advanced technologies. Many companies (approximately 70%) are engaged in a single business type and are in a subordinate position as subcontractors of MNCs. Most of the SMIs diagnosed (79%) are young as they were established in or after 1990 and some 30% of the founders are ex-employees of a MNC.

(2) Detailed Diagnosis and Technology Transfer to Companies

Some of the problems identified by the simple diagnosis were selected as target items for technology transfer. These items were classified into those relating to corporate management and those relating to production technologies. The Study team then prepared a guidance programme for each company and concrete guidance on control techniques and provided advice on processing and machining technologies while spending 3 – 5 days to analyse the problems faced by each company and observing the

[3] The 103 companies constitute 57% of the population. See Appendix III for the profile of the selected companies.
[4] See 3.1.1 of this Report for the results of the detailed diagnosis.

actual work in progress. The key points of these activities are outlined below. (Refer to the separate report entitled "Collection of Examples of Technology Transfer" for further detail.)

Firstly, in the field of corporate management, the analysis technique (radar chart) using indices showing profitability, safety and productivity was introduced so that owners can understand the advantages and shortcomings of their companies. In the case of six companies which properly prepare financial statements and control data, a case study was conducted and guidance was provided[5] using such management accounting techniques as break-even point analysis, machine charge calculation and product mix examination.

As diagnosis requires indepth professional knowledge, the Company Diagnosis Guidance (in English) was prepared and its technique was transferred to local consultants through OJT to facilitate the spread of the diagnosis techniques.

Secondly, in the field of production technologies, problems relating to such manufacturing technologies as machining and stamping (pressing) and production control techniques relating to the inventory control of products and materials, etc. were analysed at each company. The necessary instructions to solve the problems and improvement methods were then advised prior to the visit and guidance and improvement advice were provided through direct discussions on problems with the persons concerned at each company.[6]

1.2.3 Survey on SMI Support Programmes

In conducting the survey on SMI support programmes, SMI support organizations at both the federal and state levels were visited to learn the outline and implementation situation of support programmes. These visits also aimed at clarifying the problems faced by the private sector to use the programmes as indicated by the visit survey to companies.

The subjects of this survey were 19 government bodies and related organizations responsible for the implementation of the programmes and the 103 SI companies for which the simple diagnosis was conducted. During the visits to SI companies, a questionnaire survey[7] was also conducted to clarify the awareness of these programmes on the part of companies and the effectiveness of the programmes.

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5 See Appendix IV of this Report.
6 See the separate Report entitled "Technology Transfer to Model Companies".
7 See Appendix VI of this Report.

CHAPTER 2

PRESENT SITUATION OF ELECTRICAL AND ELECTRONICS INDUSTRIES AND THEIR SUPPORTING INDUSTRIES (SI)

CHAPTER 2
PRESENT SITUATION OF ELECTRICAL AND ELECTRONICS INDUSTRIES AND THEIR SUPPORTING INDUSTRIES (SI)

2.1 Trends of Macroeconomy and Industrialisation in Malaysia

2.1.1 Trends of Macroeconomy

The economic trends in Malaysia are described in this section to understand the economic environment for SI companies in the country.

The decline of the baht, the currency of Thailand, which became apparent in July, 1997 caused a similar decline of the currencies of neighbouring countries. Malaysia was no exception and experienced a substantial decline of its currency and share prices due to the rapid outflow of short-term capitals. In response, the Government of Malaysia implemented emergency economic measures, to overcome the immediate economic difficulties. At the same time, it established the National Economic Action Council (NEAC), consisting of representatives of government bodies, political and financial circles and the private sector and chaired by Prime Minister, to implement various measures designed to restore confidence in Malaysia's economy among foreign investors, to rehabilitate the national economy, to improve the international competitiveness of Malaysian industries and to strengthen the economic base.

Meanwhile, the foreign exchange rate of the Malaysian Ringgit declined from RM 2.52 to US$ 1 in July, 1997 to RM 4.80 to US$ 1 in January, 1998. However, the swift implementation of measures to overcome the crisis and the introduction of a fixed exchange rate system (on 2nd September, 1998 at RM 3.80 to US$ 1) by the federal government have begun to achieve positive effects, resulting in the earlier economic recovery of the country before neighbouring countries.

The historical changes of the main economic indices in Malaysia are shown in Table 2-1.

Table 2-1 Main Economic Indices in Malaysia

	Unit	1995	1996	1997	1998	1999	2000
Nominal GDP	RM billion	166.6	183.3	197.1	182.3	192.8	203.4*
Real GDP Growth Rate	%	9.8	10.0	7.5	▲7.4	5.8	7.5*
GDP per Capita	US$	3,960	4,543	4,377	3,933	3,238	3,390
CPI	%	3.4	3.5	2.7	5.3	4.5	-
Unemployment Rate	%	3.1	2.5	2.4	3.2	3.0	2.9*
Fiscal Balance	$ billion	1.86	1.82	6.63	–5.00	9.48	17.99
Fiscal Balance (% of GDP)	%	0.9	0.8	2.5	–1.8	–3.4	–5.9
Current Balance	$ billion	▲7.3	▲6.2	▲5.0	9.4	7.8	-
Trade Balance	RM billion	▲9.3	▲0.3	0.0	58.4	73.1	57.9*
(Exports: FOB)	RM billion	185.0	197.0	220.9	286.6	321.6	369.5**
(Imports: CIF)	RM billion	194.3	197.3	220.9	228.1	248.5	311.6**
Foreign Reserves	$ billion	23.77	25.00	15.7	26.2	26.3	-
External Debt	$ billion	30.6	33.9	31.0	30.0	30.0	-
Exchange Rate (to US$)	RM/US$	2.504	2.516	2.813	3.924	3.800	3.800

Notes : 1) * Predicted figure
** Actual figure up to the third quarter
2) The foreign exchange rate was fixed at RM 3.8 to US$ 1 in September, 1998.

Sources : IMF " World Economic Outlook '99", Ministry of Finance data, JETRO data and others.

As indicated by the various indices in Table 2-1, Malaysia's recovery from the economic crisis has been rapid and the growth of exports due to currency stabilisation by means of the introduction of a fixed foreign exchange rate has been particularly noticeable.

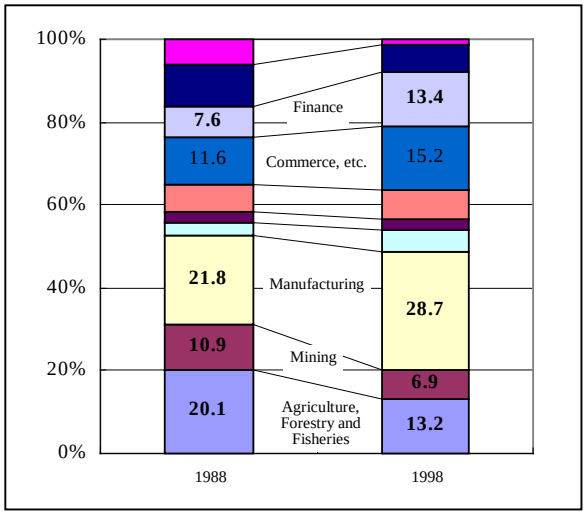
2.1.2 Historical Changes of Industrialisation Strategy

The industrialisation process in Malaysia commenced in the 1960's with the promotion of import-substitution policies. The search for the path for industrialisation turned towards export-oriented policies (including the establishment of export processing zones and the introduction of foreign capitals) in the 1970's, resulting in the rapid industrial development of the country.

These policies, however, eventually resulted in negative developments, including excessive emphasis on labour-intensive and resources processing industries and a lack of industrial linkage due to the slow development of industries producing intermediate and capital goods. The Industrial Master Plan (IMP) was introduced against this background.

Even though the IMP indicated the development targets, no laws to implement the plan backed by budgetary measures were enacted. However introduction of the Promotion of Investment Act in 1986 induced sharp increase of foreign investment in Malaysia and the rate of industrialisation accelerated with a change of the industrial structure.

The GDP share by industrial sector in Malaysia in 1998 is shown in Fig. 2-1. Compared to 10 years ago, the shares of the manufacturing sector and finance increased by 6.9% and 5.8% respectively while the shares of agriculture, forestry and fisheries and mining considerably declined.



Source: Data compiled by JICA Preliminary Study Team

Fig. 2-1 GDP Share by Industrial Sector

The progress of industrialisation caused two new problems of a labour shortage and a current deficit. To rectify the situation, the Second Industrial Master Plan set forth in 1996 (IMP2: 1996 – 2000) introduced two new concepts described as “Manufacturing++” and “ Clusters” in the attempt to transform the investment-led economy to a production led economy.

◇Manufacturing++

This aims at changing the industrial structure in Malaysia to industries producing more added value by focusing on the fact that the added value by each worker is high in such pre and post-production processes as research, trial production and marketing, etc. when production activities are considered to be a series of value creating processes (value chain) from initial research to marketing.

◇Clusters

Clusters in which related industries are engaged in activities while maintaining close mutual links are created to strengthen the competitiveness of each industry by means of rationalising production through the division of work, utilising corporate management resources in an integral manner and combining elementary technologies in a flexible manner, etc. Clusters are classified into three types: (i) international economy-linked, (ii) policy-based and (iii) resources-based.

With the introduction of these new concepts, the IMP2 adopts such targets as (i) the transformation of MNCs operating in Malaysia to integrated production centres, (ii) the promotion of cluster formation beyond national boundaries and (iii) the multi-media super corridor plan, in addition to the existing targets, including the growth of powerful domestic companies and reduced dependence on imported products.

Moreover, the SMIDEC (Small and Medium Enterprises Development Corporation) was established in 1996 to promote the development of SMIs in such sectors as electrical and electronics, automobiles, machineries, timber and shipping as the core for the promotion of SMI promotion policies in regard to finance, the development of technology and human resources, the supply of information and others.

In response to the new policies under the IMP2, the business expansion of MNCs into upstream areas (wafers and research institutes) of semi-conductor production and the emergence of leading local companies (for example, Eng Technology and Pensonic) have been reported in the electrical and electronics industries. In contrast, in the electrical appliances field in which SMIs are closely involved, the bankruptcy of MNCs and market curtailment due to plant integration have been observed due to the economic crisis in Southeast Asia in 1997. As such, the business environment for SMIs is quite severe and efforts by SMIs to shift to highly value-added production activities have experienced a blow at the initial stage. Nevertheless, moves in line with “Manufacturing++” are expected to accelerate in the coming years because of the rapid recovery of the Malaysian economy in recent years.

The historical changes of the industrialisation policy in Malaysia are summarised in Fig. 2-2.

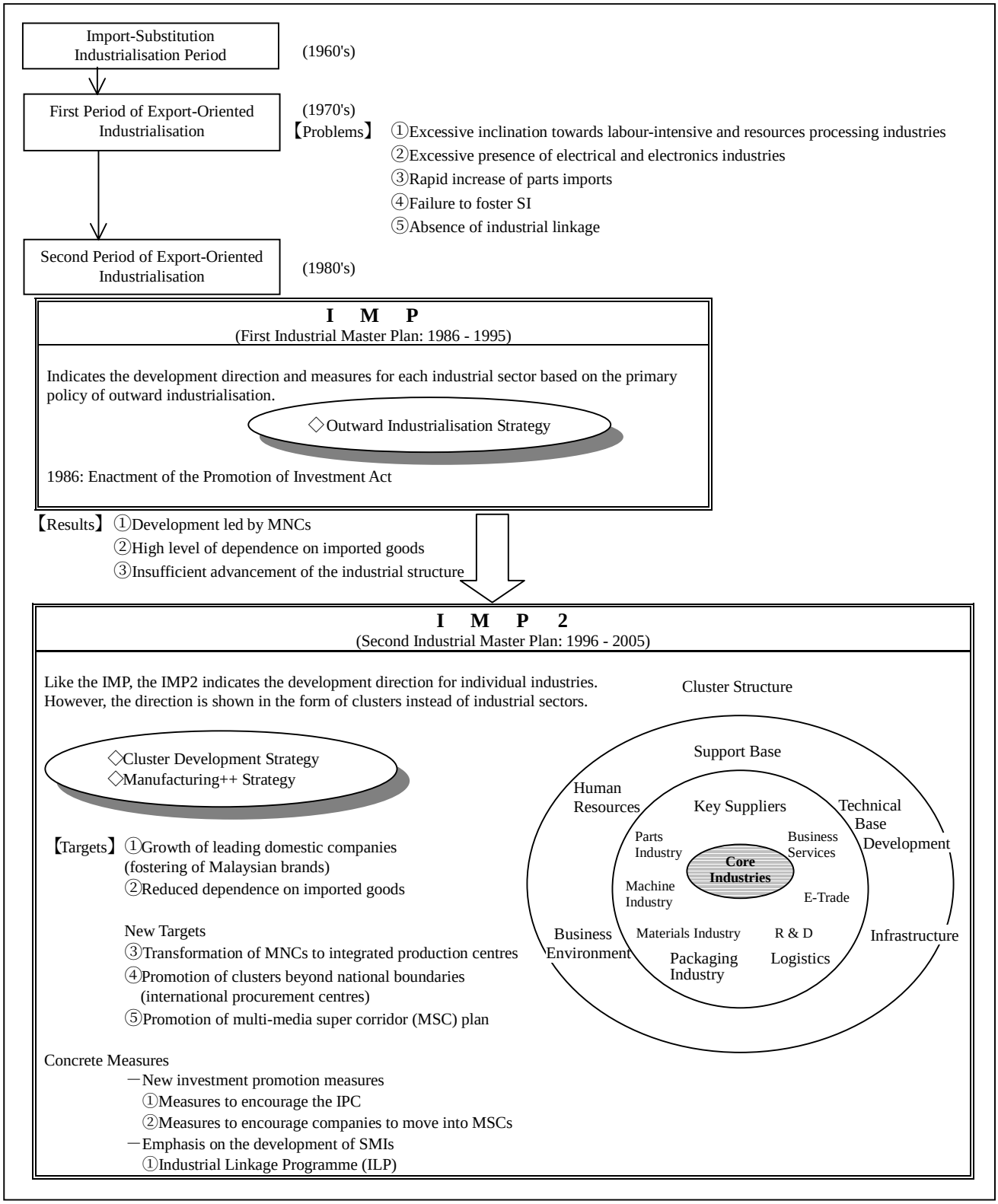


Fig. 2-2 Historical Changes of Industrialisation Policy in Malaysia

2.1.3 Present Situation of SMIs in Malaysia

In the manufacturing sector, SMIs are defined as companies with up to 250 employees and annual turnover of RM 25 million by the SMIDEC (from January, 1998) as shown in Table 2-2.

Table 2-2 Definition of SMIs in Malaysia

		Number of Full-Time Employees	Annual Turnover (RM)
SMI	Small Company	Up to 50	Up to 10 million
	Medium-Size Company	51 – 150	10 to 25 million
		Over 150	Over 25 million

Source: SMIDEC

The situation of SMIs in Malaysia is briefly described below.

Table 2-3 Distribution of Manufacturing Workplaces in Malaysia by Size

	Malaysia						Japan (1997)	
Company Size	Workplaces (%)		Employees (%)		Added Value(%)		Workplaces (%)	Employees (%)
FY	1993	1997	1993	1997	1993	1997		
1–19	68.7	58.7	7.5	4.7	3.7	2.5	73.5	22.7
20–99	20.7	25.4	18.0	15.5	14.2	11.2	22.2	31.3
100–499	8.7	12.9	32.4	32.7	33.3	31.6	Up to 999 4.1	Up to 999 34.1
500	1.9	3.0	42.1	47.1	48.8	54.7	1,000 or more 0.2	1,000 ore more 12.9
Actual Figure	23,462	23,029	1,267 K	1,411 K	44.0	79.1	358 K	9,937 K
Unit	place		person		RM billion		place	person

Notes : K = thousand
Sources : Bureau of Statistics, Malaysia

As Table 2-3 clearly shows, one characteristic of Malaysia is the large proportion of large companies in terms of the number of employees and added value, indicating the slow establishment of SMIs. To make matters worse, it has been reported that some SMIs

(approximately 10% of SMIs) have become bankrupt due to the economic crisis from FY 1997 to FY 1998.

Table 2-4 Breakdown of Ownership of SMIs in Malaysia

(Unit: %)

	SMIs	Breakdown	
	Total	Small Companies	Medium-Size Companies
Bumiputra	20	21	9
Non-Bumiputra	71	73	55
Joint Bumiputra and Non-Bumiputra	3	2	11
Government	-	-	1
Foreign Capital	6	3	23

Source: SMIDEC

As shown in Table 2-4, the absolute number of Bumiputra companies is small and they are generally small companies.

2.2 Present Situation of Electrical and Electronics Industries in Malaysia

2.2.1 Status of Electrical and Electronics Industries

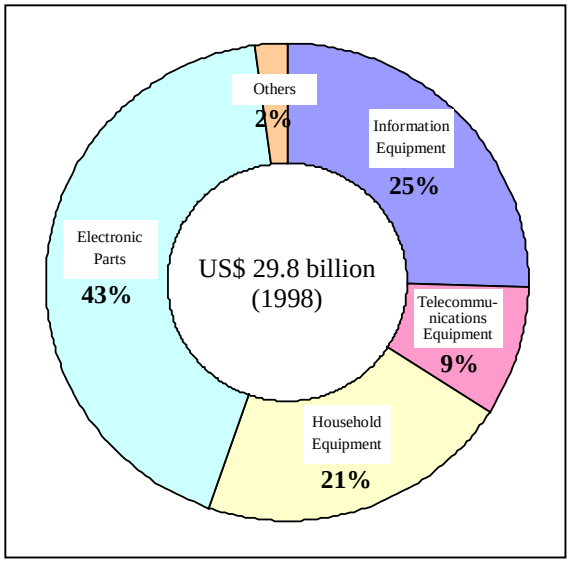
According to FY 1997 statistics, 1,079 companies (4.7% of all) belong to the electrical and electronics industries which rank eighth after the food processing industry (17.4%), sewing industry (16%), metal products manufacturing industry (12%), furniture industry (8.4%), wood products industry (6.7%), machine industry (6.1%) and plastic moulding industry (5.5%). However, the electrical and electronics industries account for 29% of the total workforce and 30.5% of the total added value, commanding the status of a leading industry in Malaysia as shown in Table 2-5.

The total production value of electrical and electronic products in 1998 was US$ 29.8 billion as shown in Fig. 2-3 which was second to Singapore (US$ 43.4 billion) among ASEAN countries. Electrical and electronic products accounted for 56% of the export value of industrial products from Malaysia.

Table 2-5 Historical Changes of Electrical and Electronics Industries in Malaysia

Year	Output		Employment		Exports		Imports	
	RM Billion	% Growth	Number 1,000	% Growth	RM Billion	% Growth	RM Billion	% Growth
1995	71.1	25.9	313.0	12.6	85.0	28.0	63.8	29.9
1996	76.0	7.0	329.1	5.1	91.7	7.9	68.0	6.6
1997	85.6	12.6	343.3	4.3	107.3	17.0	75.7	11.3
1998	103.5	20.9	320.6	-6.6	146.1	36.2	96.6	27.6
1999	129.8	25.4	381.0	18.8	178.4	22.1	108.3	12.1

Source: Based on MIDA statistics.



Source: Read Electronics Research, "World Electronics Data 1999", UK

Fig. 2-3 Breakdown of Production of Electrical and Electronic Products

However, this high growth was propelled by the inward investment by MNCs which were attracted by various preferential measures under the Promotion of Investment Act. As shown in Table 2-6, local companies have made hardly in inroads into the field of parts manufacturing as a supporting industry, indicating a relative decline of the importance of SMIs in the shadow of the growth of large companies shown in Table 2-3.

Table 2-6 Ratio of Local Companies in Parts Manufacturing Industries

Item	Taiwan				Malaysia			
	Production	Local	Japanese	US/ European	Production	Local	Japanese	US/ European
	M US$	%	%	%	M US$	%	%	%
Speakers	251	60	40	0	74	65	23	12
Variable Resisters	99	50	20	30	59	0	95	5
Fixed Resisters	221	71	11	18	76	5	93	2
Aluminium Chemical Capacitors	137	80	20	0	110	2	98	0
Ceramic Capacitors	182	28	30	42	116	5	93	2
Transformers	36	97	3	0	82	10	90	0
Coils	4	80	20	0	60	4	81	15
Connectors	421	65	10	0	43	2	90	8
Switches	50	72	28	0	26	0	100	0
Small Motors	48	15	85	0	342	0	100	0
Magnetic Heads	1	0	100	0	62	0	100	0
Switching Power Sources	562	90	8	2	224	0	100	0
Quartz Resonators	60	90	0	10	53	0	100	0

Source: This table was compiled by the Study Team using data published by the Japanese Electronic Industry Association.

2.3 Present Situation of SMI Support Programmes in Malaysia

The Study Team visited various SMI support/promotion organisations to clarify the present situation of SMI support programmes and other types of assistance available in Malaysia. The visited organisations were state and federal organisations at 18 locations in addition to the SMIDEC. These organisations and support programmes are outlined below.

2.3.1 Contents of SMIs Promotion Policies

(1) Outline of SMIs Promotion Organisations and Available Assistance

Table 2-7 shows a matrix indicating the assistance provided by 15 organisations involved in SMIs promotion. Their names, abbreviations and organisation, etc. are outlined in Table 2-8.

Table 2-7 Support Programs being Provided by SMIs-related Organisation

	Name	Financial Assistance							Human Resources Development				Information Services			
		Equipment and Business Start-Up	Working Funds	Market Development	ISO Certification	Tax Reduction/ Exemption	R & D	Introduction of New Technology	Business Guidance	ISO Certification	Control Techniques	Technical Training	Politics and Economy	Market Development	New Technologies	Introduction to Investors
Federal Government and National Organisations	MOED	○							○		○					
	BDIM	○														
	NPC									○	○				○	
	MIDF	○	○													
	BITM	○		○												
	FMM									○	○	○	○	○		○
	MIDA	○ (Bounty)				○										
	SIRIM						○			○	○				○	
	MTDC	○					○	○			○		○		○	
	SMIDEC	○	○	○	○	○	○	○	○					○		
Local Organisations	BTVC	○														
	PDC	○		○					○				○	○		○
	PERDA	○		○					○		○	○	○	○		
	PSDC								○	○	○	○		○		
	PIKS												○	○		○

Table 2-8 Outline of SMIs Promotion Organisations

No.	Abbreviation	Official Name	Outline of Organisation
1	MOED	Ministry of Entrepreneur Development	In charge of the VDP which aims at promoting Bumiputra companies
2	BDIM (BPIM)	Bank Development & Infrastructure Malaysia (Bank Pembanguan & Infrastructure Malaysia)	Loans for the procurement of equipment and land by SMIs and for the development of infrastructure
3	NPC	National Productivity Corporation	Organisation established under the MITI in 1962 and in charge of the productivity and quality aspects of SMIs promotion activities
4	MIDF	Malaysian Industrial Development Finance	Financial institution affiliated to the MITI and specialising in loans for mainly SMIs with seven branches nationwide
5	BITM	Bank Industri and Technologi Malaysia	Development bank wholly owned by the MOF
6	FMM	Federation of Malaysian Manufacturers	Federation of 2,000 manufacturing companies
7	MIDA	Malaysian Industrial Development Authority	In charge of promoting investment with the guidance of the MITI; has a home page in Japanese
8	SIRIM	SIRIM Behard (formerly the Standard and Industrial Research Institute of Malaysia)	Public corporation responsible for education, training, R & D and certification testing, etc.
9	MTDC	Malaysia Technology Development Corporation	Corporation to promote R & D and JVs and 30% share ownership by the MITI
10	SMIDEC	Small and Medium Industries Development Corporation	Key corporation for the promotion of SMIs with the guidance of the MITI
11	BTVC	Bumiputra & Technology Venture Capital	A state government-affiliated venture capital for Bumiputra companies
12	PDC	Penang Development Corporation	A corporation established by the State Government of Penang in 1969 for industrial promotion and urban development
13	PERDA	Penang Regional Development Agency	In charge of Bumiputra activities in rural areas of Penang State
14	PSDC	Penang Skills Development Centre	A vocational training centre established in 1989 with the participation of American MNCs and supported by the state government and the PDC
15	PIKS	Pusat Industri Kecil Sederhana	Established by the State Government of Penang in 1992 to promote SMIs

See Appendix VII for further details of each organisation.

(2) Current Situation and Contents of Financial Assistance Schemes

The SMIDEC and other SMIs promotion organisations provide wide-ranging financial assistance schemes as listed in Table 2-9. Of these schemes, four financial assistance packages independently controlled by the SMIDEC and two others controlled by the Central Bank are described in 1) through 4) and 5) and 6) respectively.

1) Industrial Technical Assistance Fund (ITAF)

This is a matching grant-type (50% of the total cost paid by a beneficiary) assistance scheme which was introduced in 1990 to achieve the productivity improvement, strengthening of the cost competitiveness and quality improvement of SMIs. There are four different types of ITAF. The ITAF1 is designed to assist business development and planning (grant of up to RM 40,000 to cover up to 50% of the project cost). The ITAF2 is designed to assist the development of manufacturing process and upgrading of production control (grant of up to RM 250,000 to cover up to 50% of the project cost). The ITAF3 aims at assisting productivity or quality improvement (grant of up to RM 40,000 to cover up to 50% of the project cost) while the ITAF4 aims at assisting market development (grant of up to RM 40,000 to cover up to 50% of the project cost). The ITAF2 and ITAF4 are very well known and the ITAF3 is regarded as an excellent scheme by the SMIDEC.

Since its commencement in 1990 until the end of December, 1999, a total amount of RM 50.8 million was approved for 2,331 projects (an average of RM 21,800 per project). In regard to the number of projects by scheme, the ITAF4 led the others (947 projects; 40.6%), followed with the ITAF1 (616 projects; 26.4%), the ITAF3 (531 projects; 22.8%) and the ITAF2 (237 projects; 10.2%). On a monetary value basis, however, the ITAF3 was the largest (45.1%; RM 43,000 per project), followed by the ITAF2 (25.9%; RM 55,600 per project), the ITAF1 (16.3%; RM 13,500 per project) and the ITAF4 (12.8%; RM 6,800 per project). The ITAF4 showed the lowest average grant of RM 6,800 per project even though it covered the largest number of projects.

During the same period, the total grants approved by business type were the largest for wood products (352 projects), followed by E & E products (333 projects), plastic products (229 projects), metal products (226 projects) and food products (218 projects), illustrating the key status of the wood products industry in Indonesia.

Table 2-9 Finance and Credit Facilities for SMIs in Malaysia

Name	Facilities Offered	Form of Facility	Implementing Agency
1. Industrial Technical Assistance Fund (ITAF)	i .ITAF 1 - Business Planning and Development Scheme ii .ITAF 2 - Process amd Product Dvelopment Upgrading Scheme iii .ITAF 3 - Productivity and Quality Improvement and Certification Scheme iv .ITAF 4 - Market Development Scheme	50% matching grant	SMIDEC
2. Modernisation and Automation Scheme for SMIs	Loan size : Maximum RM 1 million (not exceeding 75% of cost of machinery) Purpose : For purchase or machinery and equipment Loan period : 5 - 10 years	Interest rate : 4.0%	MIDF
3. Quality Enhancement Scheme for SMIs (Bumiputra only)	Loan size : RM30,000 - RM1million Purpose : For purchase of machinery and equipment Loan period : 5 - 10 years	Interest rate : 4.0%	Bank Pembanguan
4. Financial Package for SMIs (PAKSI)			
(i) Project Financing	Loan size : RM2 million (maximum) Purpose : Purchase of factory lots, machinery & consultancy Loan period : 10 years (maximum)	Interest rate : 3.5-4.0%	Bank Industri
(ii) Working Capital	Loan size : RM1 million (maximum) Purpose : Purchase of raw material Loan period : Full payment upon completion of contract	Interest rate : 5.0%	
5. Small & Medium Scale Industry Promotion Programme (SMIPP)	Loan amount : Maximum RM5 million (up to 75% of cost of project) Purpose : Purchase of equipment and and machinery, fixed assets Loan period : Not exceeding 15 years	Interest rate : 7.0%	(I) Bank Industri (ii)Bank Pembanguna (iii)MIDF
6. Financing for the Manufacturing Sector	Percentage of Financing : Up to 85% of project cost subject to 3.5:1 gearing ratio Purpose : For purchase of plant, machinery & equipment, factory buildings Loan period : 15 years	Interest rate : 6.5-8.5%	Bank Industri
7. Suppliers' Credit Scheme			
(i) Pre-Shipment	Percentage of Financing : Up to 85% of export order value Purpose : To assist exporters to finance part of their working capital during production stage Loan period : Maximum 120 days	Interest rate : 9.0%	Bank Industri
(ii) Post-Shipment	Percentage of Financing : Maximum 95% of export invoice value Purpose : To provide funds to exporters for their export sales on credit Loan period : Maximum 180 days	Interest rate : 9.0%	
8. Buyer's Credit Scheme	Percentage of Financing : Maximum 85% of contract value Purpose : To assist foreign importers to purchase Malayslan manufactured goods Loan period : 10 years	Interest rate : 9.0%	Bank Industri

Name	Facilities Offered	Form of Facility	Implementing Agency
9. Trade Financing Facilities	Loan amount : Minimum value per transaction US$100,000 Purpose : To assist Malaysian importers for purchase of of raw and construction materials from member and non-member countries of IDB Loan period : Between 9 - 24 months	Conforming to Syariah Law, no interest is charged. A mark-up of 6% charged of total purchase price for member countries and 6.5% charged to non-member countries	Bank Industri (financing facility provided by Islamic Development Bank (IDB)
10. Longer Term Trade Financing Scheme	Loan amount : Up to 80% of the value of export item Purpose : For purchase of consumer commodities, intermediate and capital goods Loan period : Between 6 - 60 months	Mark-up : 6.0%	Bank Industri (financing facility provided by Islamic Development Bank (IDB)
11. Special Loan Scheme for SMIs			
(i) Industrial Adjustment Fund	Loan size : RM100,000-RM10 million Purpose : Fixed asset loan and leasing (wood-based sub-sectors only) Loan period : Maximum 8 years	Interest rate : 7.75%	(i) Bank Pembangunan (ii) MIDF
(ii) Special Fund for Tourism	Loan size : RM100.000 - RM2.25 million Purpose : Fixed asset loan (tourism sector only) Loan period : Maximum l0 years	Interest rate : 6.5%	Bank Pembangunan
12. Special Loan Scheme (Bumiputera only)			
(i) New Entrepreneur Fund (NEF)	Loan amount : RM100,000 - RM5 million Purpose : For purchase of machinery and equipment, fixed asset and working capital Loan period : Maximum 8 years	Interest rate : 5.0%	Bank Pembangunan
(ii) New Entrepreneur Fund Guarantee Scheme	Loan amount : RM2 million Purpose : to provide 80% guarantee of principal loan Guarantee : Maximtan 8 years period	Interest rate : 5.0%	Credit Guarantee Corporation (CGC)
(iii) Bumiputera Industria Fund	Loan amount : RM100,000 - RM2.5 million Purpose : For purchase of machinery and equipment, fixed asset and working capital Loan period : Maximum 8 years	Interest rate : 5.0%	(i) Bank Pembangunan (ii) MIDF
(iv) Seed Capital Scheme	Loan amount : Maximum RM5 million or 75% of cost of asset to be purchased Purpose : For syariah financing for fixed asset, working capital and share financing Loan period : Maximum I0 years	Interest rate : 4.5%	Bank Pembangunan

Name	Facilities Offered	Form of Facility	Implementing Agency
13. Normal Loan Scheme (Bumiputera only) (i) Project Loan	Loan amount : Minimum RM100,000 Purpose : Fixed asset loan, working capital and syndicated loans Loan period : Fixed asset - Max. 12 years Working capital - 2 - 4 years	Interest rate : BLR + 2.0%	Bank Pembangunan
(ii) Leasing	Loan amount : Minimum RM100,000 Purpose : For leasing financing of machinery and equipment Loan period : Maximum 5 years	Interest rate : 5.0%	Bank Pembangunan
(iii) Share Financing	Loan amount : RM100,000 - RM5 million Purpose : To take up equity in companies Loan period : Maximum 5 years	Interest rate : 5.0%	Bank Pembangunan
14. New Principal Guarantee Scheme (New PGS)	Loan amount : RM3 million - RM7.5 million Purpose : For ECR, bills purchased, trust receipts, hire purchase, leasing, bank guarantees. Guarantee Coverage : With collateral - 80 - 90% : Without collateral - 70 - 80%	Interest rate : BLR + 2.0%	Credit Guarantee Corporation (CGC) (all commercial banks and finance companies participate in this scheme)
15. Banker's Export Finance Insurance Policy (BEFIP)	Loan amount : 90% of loss of pre-shipment and post-shipment loans/advances Purpose : Indemnifies local banks against loss from the failure of an exporter/supplier to repay export loans/advances due to insolvency and/or protracted default Loan period : Maximum cerdit period 180 days		Malaysian Export Credit Insurance Bank (MECIB)
16. Integrated Lending Scheme (ILS)	Loan amount : RM7.5 million Purpose : To provide guarantee of credit facilities of up to RM2.5 million offered by commercial banks except Bank Industri	Interest rate : BLR + 2.0%	Credit Guarantee Corporation (CGC) Participating banks: Maybank, BBMB, OCBC, Hongkong Bank, Hock Hua, Bank Industri
17. Fixed Rate Loan Scheme (i) Project Loan	Loan amount : Up to 70% financing of fixed assets Purpose : For purchase of land, factory building, plant and machinery Loan period :5 - 12 years	Interest rate : 8.5 - 10.5%	MIDF
(ii) Machinery Loan	Loan amount : Up to 75% cost of plant and machinery Purpose : For purchase of plant and machinery Loan period : 3 - 6 years	Interest rate: up to 5 years	MIDF

Name	Facilities Offered	Form of Facility	Implementing Agency
(iii) Factory Mortgage Loan	Loan amount : Up to 70% cost of land and factory building Purpose : For purchase of land and factory building Loan period : 5-12 years	Interest rate: up to 5 years	MIDF
(iv) Lease Financing	Loan amount : Up to 100% lease financing Purpose : To purchase plant and machinery	Interest rate : 6.0 - 7.0%	MIDF
18. Special Loan Schemes (i) AJDF	Loan amount : Maximum RM5 million Maximum RM20 million Purpose : To promote the development of Malaysian SMIs Loan period : 5-12 years	Interest rate : 6.5% Interest rate : 7.75%	MIDF EXIM Bank
(iii) Swedish Fund for Environmental and Control	Loan amount : Up to US$5 million Purpose : For purchase of equipment and machinery for environmental projects Loan period : Maximum 6 years	Interest rate : 5.0%	MIDF
19. Majlis Amanah Rakyat (MARA)	Loan amount : Maximum RM250,000 Purpose : To purchase of vehicles Loan period : 1 - 10 years	Interest rate : 5.5-7.0%	MARA
20. Fund for Food (3F)	Loan amount : Up to 90% cost of project Purpose : To promote investment in food production	Interest rate : 4.0%	Bank Negara
21. Fund for SMIs (TIKS):	Loan amount : Minimum RM50,000.00 Maximum RM5 million Purpose : Expansion of productive capacity Utilisation of existing capacity Working Capita Loan period : 7 years	Interest rate : 8.5%	Bank Negara
22. Rehabilitation Fund for SMIs	Loan amount : Minimum RM50,000.00 Maximum RM5 million Purpose : SMIs facing non-performing Loans and temporary cash flow problems Loan period : 7 years	Interest rate : 5.0%	Bank Negara

Source: MITI

In the single year of 1999, 455 projects were approved with total grants of RM 9.1 million and grants under the ITAF1 topping the table although grants under the ITAF1 were the second largest on aggregate. In general, there is a tendency for the amount of grant per project to decrease.

Table 2-10 Approvals under ITAF Schemes

Scheme	Approvals			
	1999		1990-December 1999	
	Number	Value (RM million)	Number	Value (RM million)
ITAF 1	160	1.0	616	8.30
ITAF 2	35	2.0	237	13.18
ITAF 3	152	5.8	531	22.9
ITAF 4	108	0.28	947	6.48
Total	455	9.1	2,331	50.8

Source: SMIDEC

2) Soft Loan Scheme for Modernisation and Automation (MAS)

This soft loan (public loan of which the interest rate is set slightly lower than the commercial rate) scheme controlled by the SMIDEC is provided through the MIDF (a development bank under the supervision of the MITI). The MIDF provides loans to cover up to 75% of the machine/equipment procurement cost of the process automation and modernisation of SMIs. The annual interest rate is 4%.[1] and the loan period is 5 – 10 years with a loan limit of RM 1 million.

As of December, 1999, RM 81.6 million has been approved for 176 modernisation and automation projects (an average of RM 464,000 per project) (disbursement rate: 71%). In terms of the number of approved projects by business sector, metal products topped the table with 58 approved projects (33%), followed by machinery and engineering with 45 projects (25.6%), plastic products with 23 projects (13%) and E & E products with 23 projects (13%) as shown in Table 2-11.

[1] As of 2000, the market interest rate is 8.5~9.0%.

Table 2-11 Modernisation and Automation and Quality Enhancement Schemes

Approvals by Sector (as at December 1999)	Modernisation and Automation	Quality Enhancement
Food products	-	46
Wood products	2	50
Textiles and apparels	3	4
Chemicals and petrochemicals	-	2
Rubber products	5	4
Plastic products	23	12
Metalworking and metal products	58	10
E&E	23	6
Transport equipment	11	-
Machinery and engineering	45	6
Printing	5	1
Services	-	7
Others	1	3
Total	176	151

Source: MIDF & BPMB & SMIDEC

3) Soft Loan Scheme for Quality Enhancement of SMIs

This loan scheme exclusively aims at improving the production processes and productivity of Bumiputra SMIs and is implemented by the BPIM. The loan targets are new machinery and equipment. The annual interest rate is 4% and the loan period is 5 – 10 years with an upper loan limit of RM 1 million.

As of December, 1999, a total of RM 74.9 million has been approved for 151 projects (an average of RM 496,000 per project). By business sector, the wood products sector was the largest recipient with 50 projects (33.1%), followed by food products with 46 projects (30.5%) and plastic products with 12 projects (7.9%). Because of the fact that the targets of the scheme are Bumiputra SMIs, traditional industries receive a large proportion of the loans.

4) Financial Package for Small and Medium Industries (PAKSI)

This soft loan scheme was introduced during the currency crisis in 1997 and two types of loans are provided for project financing and working capital financing. The scheme was introduced to respond to the increased demand for working capital at the time of the currency crisis. The loans are executed by the BIM. The upper loan limit and annual interest rate are RM 2 million and 3.5 – 4.0% respectively for project financing and RM 1 million and 5.0% respectively for working capital financing.

As of the end of December, 1999, a total of 30 applications have been made, 29 of which were approved. 18 applications (62%) were for project financing and 11 were for working capital financing. Of the approved RM 18.1 million, RM 15.6 million was actually disbursed (disbursement rate: 86.2%; an average of RM 538,000 per loan). By business sector, machinery and engineering accounted for 10 approved projects while plastic products accounted for eight approved projects (Table 2-12).

Table 2-12 PAKSI Approvals by Industry (as at December 1999)

Industry	Approvals	
	Number	Percentage (%)
Food	1	3.5
E&E	3	10.3
Plastics	8	27.5
Rubber	1	3.5
Machinery and engineering	10	34.4
Metal	1	3.5
Printing	1	3.5
Chemical and petrochemical	1	3.5
Services	3	10.3
Total	29	100.0

Source: Bank Industri / SMIDEC

5) Fund for SMIs (FSMI)

The FSMI scheme of the Central Bank (Bank Negara) was established in January, 1998 with the aim of expanding the production capacity for export promotion and diversification of SMIs. The original budget allocation of RM 1.5 billion was doubled because of the massive response to the scheme by SMIs.

As of the end of December, 1999, loans for 4,216 SMIs have been approved with total loan amount of RM 3 billion (an average of RM 711,000 per company). By sector, the service sector is the largest recipient with 2,043 companies, followed by the manufacturing sector (1,838 companies) and the agricultural sector (335 companies).

6) Rehabilitation Fund for SMIs

This fund was created in 1998 to provide temporary relief for the liquidity crisis, originating from the currency crisis, among SMIs. A total fund of RM 750 million was provided by 50 financial institutions.

As of the end of December, 1999, 289 SMIs have been approved for financial assistance by this fund, receiving a total of RM 251 million (an average of RM 890,000 per company).

The main loan schemes described above, mainly featuring soft loans, are compared in Table 2-13. While the presence of commercial banks among the financial institutions providing loans makes the use of loans more convenient because of a higher loan limit, etc., it tends to increase the interest rate. The use of soft loans provided by government-affiliated development banks is indeed less convenient because of the lower loan limit and the self capital requirement of at least 70%. In short, it is essential for SMIs to select the appropriate schemes for their own financing requirements.

Table 2-13 Comparison of Loan Schemes

	Modernisation and Automation Scheme for SMIs	Fund for Small and Medium Industries	Rehabilitation Fund for Small and Medium Industries
< Outline of Fund >			
Fund Total	RM 70 million	RM 1.5 billion	RM 750 million
Fund Source	MITI	Government of Malaysia	Government of Malaysia
Establishment	Beginning of 1993	December, 1997	November, 1998
Loan Amount	Up to RM 1 million	RM 0.05 – RM 5 million	RM 0.05 – RM 5 million
Annual Interest Rate	4%	10%	5%
Loan Period	5 – 10 years	to 31/12/2000	Up to seven year
Grade Period	Yes	-	-
Loan Subjects	Machinery, equipment	Equipment; working capital	Equipment; working capital
Lender	MIDF	Four development banks 13 commercial banks	Four development banks 36 commercial banks 10 non-banks
Loan Composition	-	Up to 75% of the project cost	Up to 30% of the loan can be used to repay debts
Loan Type	Soft loan	Anything except to cover an overdraft of current account	-
< Eligibility >			
Target Sector	Registered manufacturing companies in Malaysia	SMIs in specified industries	SMIs with financial problems
Self Capital	< RM 2.5 million	< RM 10 million	< RM 10 million
Malaysian Capital	> 70%	> 51%	> 51%

Source: Based on pamphlets published by the relevant banks.

7) Credit Guarantee by CGC (Credit Guarantee Corporation)

The CGC was established on 5th July, 1972 in accordance with the Malaysian Company Law (1965). Its main purpose is to assist small businesses which have insufficient or no collateral or little record of its business activities to obtain a bank

loan. Although the CGC does not have its own branches, it operates through networks of more than 2,000 branches of its shareholders, i.e. 37 commercial banks and 40 finance companies. Since 1994, the scope of the CGC's credit guarantee has been expanded to include medium size companies to supplement the government's efforts to foster and develop SMIs in key industrial sectors. Its largest shareholder is the Central Bank (Bank Negara) with a shareholding of 70%. While the capital contribution ratio of the private sector was extremely high in the past, the increased contribution by Bank Negara, resulting in the strengthening of government assistance, can be evaluated as a positive development. As in the case of many other credit guarantee associations in the private sector, the CGC is facing such tasks as securing sufficient funds to provide credit guarantee, increasing the recovery rate and ensuring efficient risk management. Meanwhile, many financial institutions have been making complaints in regard to the long period required for the evaluation of collateral and high premium rate imposed by the CGC.

(3) Current Situation of Market Promotion Measures

1) Implementation Situation of ILP (Industrial-Linkage Programme)

The SMIDEC provides "a light on meeting" (place for meeting) for the purpose of matchmaking between large companies and SMIs. The participants of this "light on meeting" are large companies, SMIs, banks and engineers. The SMIDEC participates in such meetings as an observer and is not involved in the decision making process. At this "light on meeting", SMIs make presentations on their specialist technologies. The participating large companies are selected through the business channels of the MIDA while the candidate SMIs are selected from the database of the SMIDEC.

The incentives to participate in the ILP are (i) SMIs producing intermediate products are awarded pioneer status which gives them the right to apply for tax exemption for five years or the full application of 60% tax reduction for equipment investment and (ii) large companies are given the right to apply for tax reduction of auxiliary costs relating to training, auditing and technical assistance, etc. In the three year period from 1997 to the end of 1999, a total of 122 SMIs were linked to MNCs or large companies and the ILP-related market with RM 111.3 million (RM 912,300 per SMIs) was created. To be more precise, 35 SMIs successfully secured sales with MNCs (worth RM 27.8 million), 34 SMIs are still negotiating with MNCs (worth RM 31.1 million) and 53 SMIs have a prospect of securing MNCs as new customers (worth RM 52.4 million) (Table 2-14). These figures mean that 75% of SMIs in

contact with MNCs did not have a secured trading agreement at the end of December, 1999.

The composition (on a monetary basis) of the ILP by business sector shows that E & E accounts for 42.4%, illustrating is principal status in the ILP. The second largest sector is machinery and engineering (23.3%), followed by resources based (21.6%) and transportation and marine (12.8%).

Table 2-14 Performance of the Industrial Linkage Programme, 1997 and 1999

Sector	E&E		Transportation and Marine		Machinery and Engineering		Resource Based		Total	
	No.	Value (RM mil)	No.	Value (RM mil)	No.	Value (RM mil)	No.	Value (RM mil)	No.	Value (RM mil)
Sales secured	17	16.8	11	7.7	2	0.8	5	2.5	35	27.8
Under negotiation	16	9.4	2	2.8	9	10.5	7	8.4	34	31.1
Prospects	21	21.6	5	4.3	15	14.6	12	11.9	53	52.4
Total	54	47.21	18	14.22	26	25.9	24	24.0	122	111.3

Source : MIDA

In 1999, MNCs imported RM 113.8 billion worth of parts and components. It is, therefore, still important to foster SMIs through market promotion measures.

2) Foreign Investment Promotion Measure

The foreign capital investment ratio for manufacturing companies used to be determined based on the product export ratio. Since 31st July, 1998, however, the following relaxation measure has been in place.

① A foreign investor may have a capital investment ratio of up to 100% regardless of the export ratio.

② This relaxation measure is applicable to all manufacturing projects for which an application is received during the period from 31st July, 1998 to 31st December, 2000. However, specified businesses in which Malaysian SMIs have sufficient skills are excluded. These businesses are paper packaging, plastic packaging (bottles, films, sheets and bags), plastic injection moulding, metal stamping, metal processing, electric plating, wire harnessing, printing and steel service centres.

③ It is unnecessary for all projects approved under this measure to reconsider the capital investment ratio even after the designated period.

④ This measure will be reviewed after 31st December, 2000.

(4) Present Situation of Measures to Strengthen SI

1) VDP (Vendor Development Programme)

The VDP is a scheme under which MNCs which are designated by the government and called anchor companies provide assistance for SMIs which are described as vendors. MNCs are approached by the government to foster vendors. The responding MNCs (anchor companies) select vendors and provide technical as well as managerial guidance while financial institutions provide long-term, low interest loans for vendors. The first anchor company was PROTON which subsequently fostered many Bumiputra vendors. The VDP was launched in 1988 and was transferred from the MITI to the MOED in 1995, one year before the establishment of the SMIDEC. The VDP aims at upgrading the technological level of Bumiputra SMIs in collaboration with MNCs, vendors and banks so that vendors can grow into global suppliers for MNCs. By the end of 1996, 94 vendors had been selected: 19 by PROTON (automobile), 12 by the Sony Group (electrical and electronics), 12 by General Lumber Furniture (furniture), 11 by the Perbadanan Group (telecommunications), 9 by Sapra Holdings (telecommunications), 9 by the Sharp Group (electrical and electronics), 6 by the JVC Group (electrical and electronics), 4 by the Matsushita Group (electrical and electronics) and 12 by others. Even though the VDP is favourably evaluated by vendors in general, it is often regarded as a burden imposed by the government among anchor companies.

2) GSP (Global Suppliers Programme)

The GSP is an upgraded programme of the VDP and is an education and training programme aimed at developing SMIs as international suppliers.

Under this scheme, MNCs play a central role in selecting SMIs, preparing textbooks and dispatching instructors. In the case of Corecom 1, a basic training course, for example, if the trainees are employees of SMIs as defined in Malaysia, 50% of the course fee is paid by the SMIDEC. At the same time, if the companies employing these trainees are contributors to the HRDF (Human Resources Development Fund), 45% of the remaining 50% of the course fee is paid by the HRDF with the trainees paying only 5% of the course fee. The GSP, which was jointly launched by the PSDC in March, 1999, had received RM 108,550 from the Treasury by December,

1999 in the name of training expenses. 190 companies, including 120 SMIs and 24 MNCs, have applied for the Corecom 1.

2.4 Needs of MNCs

In the midst of harsh international competition, the business environment is becoming increasing severe and MNCs are demanding that suppliers comply with the “quality, cost and delivery terms (QCD)” more strongly than before. At the same time, MNCs themselves are actively implementing the rationalisation of production staff, improvement of equipment efficiency and cost reduction to strengthen their own competitiveness.

The following section describes what kinds of services MNCs expect from SI companies and how they evaluate existing SI companies in view of the expected services under such a business environment.

2.4.1 State of Procurement by MNCs

(1) Procurement Sources

Fifty-four companies responded to the questionnaire on “the procurement sources of parts and materials” conducted in January, 1999 by the Sansui-Kai and the results are shown in Fig. 2-4.

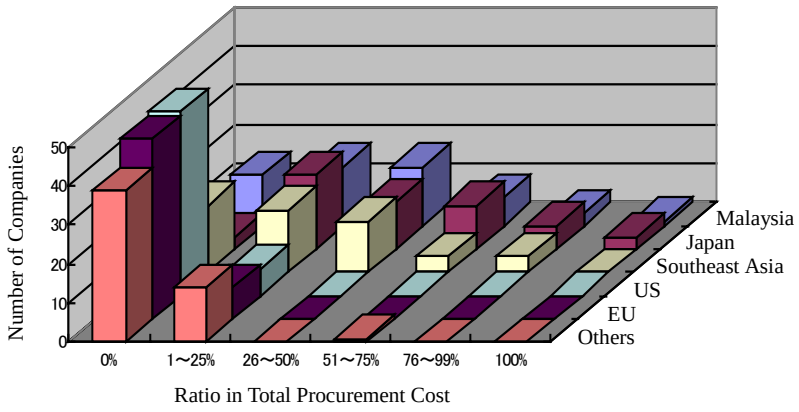
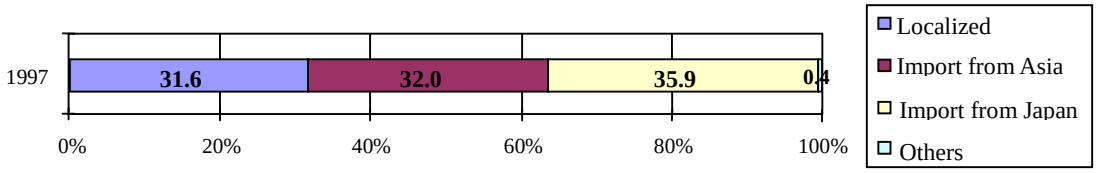


Fig. 2-4 Geographical Distribution of Material Suppliers

According to Fig. 2-4, three companies (5.5%) entirely procure from Japan while 13 companies (24.1%) do not procure from Malaysia at all.

An average company procures one-third of its materials each from Japan, Malaysia and Southeast Asian countries. This tendency is also observed by Japanese companies operating in other countries (see Fig. 2-5).



Source: MITI, Overseas Activities by Japanese Companies, FY 1997

Fig. 2-5 Parts Supply Sources for Electrical Manufacturers in China

The results of a questionnaire survey[2] conducted by a Japanese expert in 1999 with Malaysian companies in the electrical and electronics industries shows that the total procurement value of parts and materials of 111 companies was approximately RM 7 billion and that more than 70% of the procurement was conducted in foreign countries. This fact indicates the need for local parts and materials suppliers to improve both their technological and capital strength in order to be able to supply materials and key components which are comparable with those imported from Japan and/or to improve their quality maintenance capability and price competitiveness to match the parts, jigs and tools imported from other Southeast Asian countries.

The feasibility of such improvement is shown by the results of the continual surveying of its member companies by the JACTM. According to these results, the local content has been steadily increasing to the point where 38.9% of companies recorded a local content of 50% or more in 1999. This trend is expected to continue with the relevant efforts of local SI companies in Malaysia.

(2) Procurement Items

The results of the questionnaire survey conducted by the said expert show that among parts for complete products (or functional products) in the semiconductor, telecommunications equipment, AV and household electrical appliance industries, stamped or moulded parts requiring an intermediate level of precision can be sufficiently supplied locally. However, products requiring advanced technologies to achieve high precision, high accuracy or high integration are predominantly imported.

[2] Survey on Market Needs for Supporting Industries in Malaysia, 1999 featuring 111 SI companies in the electrical and electronics industries.

The ratio of local supply decreases towards materials, i.e. the products of upstream industries. Even in the case of plastic and metal materials which are used in large quantities, special products or specially processed materials are imported. Meanwhile, machinery is also almost entirely imported.

(3) Imported Goods for Which Substitute Production by Malaysian Companies is Hoped For

According to the above-mentioned questionnaire survey, MNCs are hoping to locally procure the following goods.

- Raw Materials

  Such metal materials as aluminium, gold, brass, copper and stainless steel, resins for moulding, ceramic materials, industrial chemicals and silicon rubber, etc.

- Processed Raw Materials

  Alloys, laminates, specially processed metal-based materials (silver paste and aluminium-copper-based precision foil, etc.), specially processed industrial chemicals (solder masks, ultraviolet hardened ink, phenol base and chemicals for advanced plating, etc.)

- Processed Materials for Component Parts

  Ceramics (functional products such as packages, wafers and elements, etc., at the stage immediately prior to actual parts), composite parts (including units and pick-up components for HDDs which already have a certain function through the combination of several parts), core materials, including felite, electrolytic paper (component for electrolytic capacitors), machined goods (such precision machined goods as lead frames, lids, shadow masks and diaphragms, etc.), metal materials (cases, covers, cans, magnets, predecessors of lead frames, etc.), materials for PCBs, moulded plastic goods, wafers (semiconductor wafers and pellets), wire (lead wire and copper wire, etc.) and others (special ink and silicon materials, etc.

- Parts

  Cables, devices, displays, single parts and materials for assembly, mechanism elements (connectors and switches, etc.), PCBs and semiconductors

- Tools and Others

  Tools and dies

2.4.2 Parts and Services from SI Required by MNCs

From the results (163 companies which completed the questionnaire, 75 are in the electrical and electronics industries) of latest questionnaire survey (FY 1999) conducted by JACTIM with member companies and the visit survey to MNCs by the Study Team, the requirements of SI by MNCs are summarised below.

- Parts and processing services : machining, precision pressing, precision plastic moulding, heat treatment, electrical and electronic parts and plating
- Materials : resin materials, metal materials and chemical agents
- Others : industrial waste disposal, jigs and tools, press dies, plastic dies and automation equipment

Of the parts and services required by MNCs as found by the questionnaire surveys by the experts and the JACTIM, those relating to the materials industry, which is considered to be a capital-intensive industry, and electrical and electronic parts requiring advanced production engineering cannot be provided by SMIs. Despite this, some business types required by MNCs do exist in Penang. The reasons for the slow progress of local procurement are presumably that (i) many companies are lacking in one or more aspects of QCD (quality, cost and delivery) vis-à-vis the level required by MNCs and (ii) there are insufficient means for MNCs to find good suppliers.

2.4.3 Evaluation of Existing SI Companies

The visit survey to MNCs established the following typical evaluation of SI companies by MNCs.

- While the skill/technological capability to machine individual parts according to drawing specifications is available, the skill/technological capability to combine them to create dies with the required functions is lacking.
- Machining precision in the order of 10μ is possible but not in the order of 1μ. In addition, the surface finish is poor.
- There is no sense of keeping to the delivery terms. It is not uncommon for others to be blamed for failure to keep to the delivery terms (for example, the failure of a parts supplier to deliver parts has made their assembly impossible and, therefore, the responsibility lies with the parts supplier).

- While resin moulding can be conducted, the moulding of engineering plastics is beyond the capability.
- Even though trial products are fairly good, the technical and managerial capability to achieve mass production is lacking.
- There should be an increase of the number of SI companies which can produce and deliver their products in accordance with the requirements of the JIT system.

The above evaluation results support the argument that the inadequate level of QCD which falls short of the requirements of MNCs is the reason for the slow increase of the local content. In particular, the quality appears to be well below the required standard.

A similar result was produced by the 1999 questionnaire survey by the JACTIM as 87.8% of companies (an increase from 42.1% in the 1996 survey) cited quality as a factor impeding procurement from local companies. A relatively lower emphasis on delivery and cost as reasons for the low local content was noticeable in the survey. Such complaint about quality does not necessarily indicate an absolute decline of the quality control capability of Malaysian companies but presumably reflects the fact that the scope of parts supplied to MNCs has expanded to include more advanced parts.

2.4.4 Response by MNCs

MNCs are earnestly reforming their production methods in order to survive the international competition. Therefore, in terms of procurement, they are highly flexible in regard to increasing the number of procurement items and finding new vendors using the IPC instead of simply persisting with conventional methods. At the SMIDEX 2000, Japanese and American/European MNCs expressed their willingness to increase the local content of high function, high precision components and parts.

Meanwhile, many MNCs dispatch staff members or engineers to inspect production activities to ensure compliance with the required quality. This means that an increase of the number of SI companies with which they trade increases the burden of inspection. Therefore, there have not been active efforts to widen the scope of suppliers. On the contrary, there have been moves to place blanket orders to leading SI companies (for example, an order to a plastic moulding company includes the detailed design and manufacture of dies) with a view to reducing the in-house cost and management time for order placement so that the surplus capacity in terms of manpower and time, etc. can be used to improve the strength of the MNCs themselves. Consequently, there is a trend of order placement being concentrated on several leading SI companies.

Leading assembly makers (MNCs) conduct breakdown cost analysis where all subcontractors are invited to tender once every six months as a trial product(s) is broken down into individual components/parts for which the required specifications are clearly indicated to the attending subcontractors. This practice aims at continually reducing the cost by compelling SI companies to compete with each other.

2.4.5 Different Approaches of Japanese and American/European MNCs

There is a marked difference in the approach of Japanese and American/European MNCs to SI companies. While the latter try to establish a collaborative relationship and regard SI companies as equal partners, the former demand fine control and quality and regard SI companies as subcontractors which share part of the production line.

For example, Agilent (an American MNCs), which plays an anchor role in the GSP,[3] conveys its technical demands in an unmistakable manner and considers that their achievement are the responsibility of its partners. Agilent does not provide concrete guidance on technical matters to be solved by its partners as it believes that such guidance is impossible as it is not an expert in all of the fields concerned. Accordingly, it expects public support organisations (PSDC and others) to provide the necessary education.

In the case of OSRAM (a German MNCs), ISO 9000 certification is a compulsory requirement for all suppliers. OSRAM's contracts are awarded to a SI company which can solve the problems relating to the demands made by OSRAM. OSRAM understands that the implementation of this procedure is the responsibility of an anchor company.

In contrast, local Japanese MNCs dispatch engineers at their own expense to SI companies and make efforts to raise the technical level of the latter to produce products which meet their demands with a view to making the latter exclusive subcontractors. Because of the slow progress of this process, however, many have begun to feel that the VDP and GSP are a heavy burden for their own business operation.

2.4.6 Trade with MNCs

The criteria used by Japanese MNCs to select their trading partners are ranked below in terms of their priority.

[3] The GSP (Global Suppliers Programme) is a SI support programme provided by the SMIDEC (see 2.3.1-(4)-2).

1. Quality control capability Q
2. Target price compliance capability C
3. Delivery control capability D
4. Cost proposal capability
5. Initial price

Source: Items emphasised for supplier selection in the Questionnaire of the Japan Export Federation.

- Quality Control Capability

  The reason why MNCs strongly emphasise quality is that as their products compete in the global market based on the strength of their brands, quality which is appropriate for these brands is required. The sale of products using defective components/parts despite a low cost will make the brands lose the trust of their users. The availability of a quality control system is, therefore, the principal requirement for any trade as in the case of the OSRAM described earlier.

- Target Price Compliance Capability

  As far as the cost is concerned, it is becoming feasible for MNCs to make suppliers throughout the world compete with each other because of the advancement of IT and it is not difficult to switch to less expensive suppliers. This means that SI companies are an integral part of the international competition and that they can expand their business to MNCs throughout the world if they have sufficient strength.

- Delivery Control Capability

  Punctual delivery is also an important factor for supplier selection and the adoption of the JIT system adopted by assembly type MNCs is particularly important.

MNCs prefer to see the voluntary efforts of SI companies to upgrade themselves to an internationally competitive level so that they can support the operation of MNCs. The prospect of increased order placement to local suppliers depends on the activities of SI companies and support organisations to upgrade the QCD of SI companies.

2.5 Present Situation of Manufacturing Sector and SI in Electrical and Electronics Industries in Penang

2.5.1 Outline of Manufacturing Sector in Penang

The industrialisation drive in Penang commenced in the early 1970's and the share of the manufacturing sector in terms of its contribution to the state economy is 52% today (30.1% at the federal level), illustrating the dominant status of the manufacturing sector. The historical changes of the economic structure in Penang in terms of the GDP share are shown in Table 2-15.

Table 2-15 Economic Structure in Penang (GDP Share)

	1970	1990	1999
Agriculture	19.7%	2.8%	3.2%
Manufacturing	12.7%	50.5%	52.2%
Construction	5.8%	2.9%	3.2%
Trade and Services	61.8%	43.8%	41.6%
GDP (1978 prices)	1.25 RM billion	5.75 RM billion	12.0 RM billion

Source: PDC statistics

This remarkable progress has been led by the electrical and electronics industries. Penang Electronics, a company established by the PDC in 1970, is a prime example of the business development in these industries which has been boosted by the aggressive investment by MNCs. The structure of Penang's manufacturing sector is shown in Table 2-16.

Table 2-16 Structure of Manufacturing Sector in Penang

Type of Industry	Number of Companies	Invested Capital (RM million)	Number of Employees (persons)
Electrical and Electronics	152	3,013.9	117,832
Metals	185	975.8	17,130
Plastics	81	243.5	8,750
Paper and Printing	63	567.0	5,054
Chemicals and Fertilisers	52	820.1	4,670
Food Processing	28	82.4	2,909
Machinery	26	90.7	1,972
Textiles and Sewing	26	352.7	12,484
Rubber	21	97.1	5,608
Others	84	817.4	15,156
Total	715	7,060.6	191,565

Source: PDC statistics (as of June, 2000)

2.5.2 Present Situation of SI in Penang

The main electrical and electronic products manufactured in Penang are PCs, semiconductors, memory devices and mobile phones. The production items of SMIs supporting these industries are shown in Table 2-17.

Table 2-17 Outlook of SMIs in Manufacturing Sector in Penang

Industry	Main Business/Products	Number of SMIs	Proportion (%)	Description
Electrical	Assembly of electrical equipment	25	18	Most are engaged in the assembly of mobile phones and printed circuit boards and hardly any companies are engaged in making parts (resisters and coils, etc.)
	Printed circuit boards	12		
	Other electrical products	9		
Machine	Precision machining	30	48	Many are engaged in the manufacture of dies, tools and jigs for injection moulding or stamping. The introduction of CNC machine tools appears to be in progress.
	Metal parts	27		
	Dies	25		
	General machinery	25		
	Castings	14		
	Other machinery-related products	4		
Other Types of Manufacturing Businesses	Plastic parts	20	11	Mixture of such precision parts as electronic parts and such simple products as household containers.
	Packaging and other plastic products	8		
	Engineering and design	30	11	The technological level is unknown.
*	Clothing, jewellery and woodwork, etc.	32	12	Outside the scope of the present Study on SI.

Source: Compiled by the Study Team using the Members' List of the PIKS, 1999.

As shown in Table 2-17, nearly half of the SMIs in Penang are engaged in the manufacture of precision dies, tools and jigs. The second largest group of supporting SMIs is found in the electrical industry.

2.5.3 Clusters

Concentrations of companies directly manufacturing electrical and electronic products and of machining/processing companies producing the production items required for the manufacture of electrical and electronic products are found in northern Malaysia, including Penang State. With the development of the Klim High-Tech Park (in Kedah State) and others, these companies have now formed clusters.

Table 2-18 Products of Main MNCs Operating in Penang (and Kedah)

Product	Japanese Subsidiary	Other MNCs
Semiconductors	Hitachi Semi-con; Nittetsu Hitachi	Intel; AMD; Motorola; Agilent; Siemens
Functional Parts	Kasatani; Toshiba	Thomson; Eng Tech
Computers	NEC; Kobe Steel	Gateway; Dell; Intel; Seagate; Komag
Audio Visual Equipment	Sharp; Sony; Onkyo; Kenwood	Phillips
Telecommunications Equipment		Motorola; Ericson
Household Electrical Appliances	Matsushita (Panasonic)	Pensonic

Source: Information obtained by the Study Team.

Table 2-19 shows the investment amount, number of factories and employment in Penang by country. Investment by the US is characterised by a large amount invested in each factory as investment has been directed towards the semiconductor sector. In contrast, the investment size by Malaysian capitals is rather small. The industrial cluster in Penang is a cluster of MNCs and is characterised by a top heavy structure with investment being concentrated in the manufacture of semiconductors, telecommunications equipment and mass production components/parts. As local SI companies lack suitable strength, coupled with the absence of some SI required by the electrical and electronics industries, the linkage between MNCs and SI companies is very fragile. In other words, such fragile linkage implies that the cluster could immediately collapse if MNCs move out of Malaysia for one reason or another.

Table 2-19 Investment Amount, Number of Factories and Employment in Penang by Country[1)]

Country[2)]	Malaysia	Japan	US	Taiwan	Singapore	Germany	Others	Total
Number of Factories (A)	426	62	36	68	27	19	75	667
Number of Employees (B)	47,549	35,383	53,237	17,111	7,684	9,230	35,616	188,796
Factory Size (B/A)	112	569	1,479	252	285	486	478	283

Note : 1) Four industrial parks (Mak Mandin with 69 companies, Seberang with 25 companies, Tengah with 83 companies and Minyak with 47 companies) and two free trade zones (Bayan Lepas with 183 companies and Prai with 271 companies) in Penang
2) Country of which a company has invested 50% or more of the total invested capital.
Source : PDC statistics for 1999

2.5.4 Problems of Industrial Structure

While semiconductors, telecommunications equipment and computers currently play a leading role in the development of the electrical and electronics industries in Penang, household electrical appliances and audio equipment, centring on the labour-intensive assembly process, used to be the main players. With an increase of the labour cost, the focus of new investment or re-investment by MNCs has been actively shifting towards more value-added products and pre-processes.

Compared to the earlier household electrical appliances, the product cycle of telecommunications equipment and computer-related equipment is shorter. Faced with the harsh price competition surrounding these products in the global market, the demands of set makers, most of which are MNCs, for cost reduction and assurance of product quality and delivery are increasingly severe for SI companies. If SI companies in Penang cannot meet these demands, a labour intensive-type MNC has no choice but to opt for country hopping. According to PDC statistics, the number of electrical and electronics factories operating in FTZs and industrial parks declined by 19 from 171 in 1995 to 152 in June 2000.

Although the positive business environment for semiconductors and telecommunications equipment has ensured the growth of electrical and electronics industries as a whole, semiconductor-related SI do not allow the participation of many SMIs due to their high degree of capital and technology concentration. If the structural changes of the electrical and electronics industries described above continue, local industries consisting mainly of SMIs will face a grave crisis.

The situation described above was confirmed by the visits by the Study Team to local companies although some cases of successful penetration of the export market due to high

management and technology levels even after the withdrawal of MNCs were found. For example, Company P, of which the business consists of plastic moulding and die manufacture, used to rely on MNCs in Penang for two-thirds of its turnover in 1996. Following the relocation of this major client, however, the business picture had changed by 1998 with two-thirds of the turnover coming from sales in Europe and the US with an increase of the turnover itself by 50%. This fact indicates that local companies can survive without depending on a subordinate relationship with specific MNCs if they can improve their management and technical levels.

2.6 Present Situation of SI Companies as Revealed by Diagnosis

2.6.1 Present Situation of SI Companies as Revealed by Simple Diagnosis

Data showing the profile of the SI companies for which the simple diagnosis was conducted is given in Appendix III and these companies are outlined below.

(1) Business Contents

The businesses of the subject companies of the diagnosis are wide ranging. The three leading business fields of these companies are the manufacture of electrical and electronic parts (15 companies), press (16 companies) and machining (16 companies).

Some 70% of the companies are engaged in a single type of business while others are engaged in more than one business type. What is highly noticeable is that most of the companies manufacturing electrical/electronic parts or tools are exclusively engaged in a single business.

These companies play a subordinate role to MNCs through a direct trade relationship or as secondary subcontractors.

Trade Relationship Between 103 SI Companies and MNCs (as of March, 2000)

- Direct trade : 50
- Secondary subcontractor : 17
- No trade with MNCs : 36 (11 of those business types are not connected to MNCs)

(2) Size of Capital

Of the 103 SI companies, only one is a private business and the remainder are limited responsibility companies (Sdn. Bhd.) Although the capital size varies from one company

to another, the smallest and the largest capital sizes are RM 25,000 and RM 12 million respectively. The distribution by capital size shows that one-third have capital of less than RM 0.5 million while one-quarter have capital in the range of RM 1 million - RM 2 million.

Two companies have a state government organisation as a shareholder. This appears to symbolise the official attempt to promote businesses run by Bumiputra. However, only 19 companies, i.e. some 20% of the SI companies diagnosed, are classified as Bumiputra-run companies with most of the rest being run by Chinese owners.

There are also companies with capital investment from Singapore, Taiwan and China, etc. and a group of companies controlled by holding companies owned by overseas capitals or Chinese industrialists.

(3) Size of Turnover

The turnover figures for FY 1999 show that some 70% of the companies recorded a turnover of RM 2 million. The lowest turnover was RM 200,000 while the largest turnover was as large as RM 110 million. As some companies are simply involved in the processing of supplied raw materials using supplied dies for a fee, simple comparison based on the annual turnover does not give a clear picture of the business operation of these companies.

(4) Number of Employees

In terms of the number of employees, the largest category is between 50 and 150 employees, accounting for some 40% of the companies. The lowest figure is 4 while the largest figure is 1,132, indicating a considerable gap. Some companies use Indonesian and/or Bangladeshi workers to fill the worker shortage. The number of these foreign workers is mainly around 10 at those companies using them. In short, more than 90% of the SI companies surveyed can be classified as SMIs.

(5) Year of Establishment

The oldest company among the 103 SI companies diagnosed was established in 1967 while the newest company was established in December, 1999. Companies established in 1995 or later account for 39%, showing a relatively large proportion of young companies. Some are venture businesses pursuing R & D and the commercialisation of development technologies in collaboration with university laboratories.

(6) Profit and Loss Situation

Ninety companies replies to the question on the annual turnover while only 63 companies replied to the question on profit (indicating a general reluctance to disclose the profit and loss situation). As such, the overall situation is unclear. However, five companies reported that their business is in the red.

There are extreme cases. For example, some companies are seriously suffering from the grave downturn of the audio sector while others are enjoying a favourable upturn of orders due to their entry in the telecommunications and computer-related businesses. Many appear to be in the process of gradually strengthening their businesses, overcoming the economic recession in 1997, cost-down pressure from parent companies, increased cost of raw materials and the adverse impacts of foreign exchange fluctuations. Meanwhile, there is a general need for improved business management as the financial strength is far from satisfactory.

(7) Background of Owners

Many of the owners of local SMIs which supply products to MNCs used to work as engineers or managers of MNCs. The relevant study results show that slightly more than 30% of the owners of the companies in question formerly worked for Japanese, American or European companies operating in Malaysia. These owners have used their own contacts or their own technological expertise to realise their business of supplying parts to larger trade partners or parent companies. In many cases, they have climbed the corporate ladder, starting as a floor operator and progressing to manager, or were recruited as managers in R & D, procurement, QA, design and other departments after leaving university/college to build up their experience.

(8) Stance Towards Investment in Equipment

As the Study was conducted almost immediately after the business downturn caused by the economic recession in 1997, these companies appear to adopt a careful stance vis-a-vis investment in factory expansion, new factories and the latest equipment. The plans formulated around 1996 when business was favourable to invest in new factories (or the relocation of factories) or to introduce the latest equipment have been either postponed or abandoned because of subsequent changes of the demand situation. However, some companies express a willingness to recommence construction work to meet the necessity to introduce the latest equipment in order to increase their production capacity because of their successful efforts to create new demands and new customers if their observation of the current business and demand trends give them sufficient confidence to do so.

In particular, some companies engaged in precision machining or the manufacture of precision dies, jigs and tools show a positive business stance in regard to the procurement of the latest wire EDM and CNC machine tools in response to customer demands for product precision. Nevertheless, most companies still have bank loans originating from the recession in 1997. The general impression is that many companies are trying hard to suppress the level of borrowing from banks and other external funding sources to improve their cash flow position.

As far as the interview results are concerned, many owners want to rely on their own funds to cover the working capital while relying on banks or external funding for equipment investment. Some companies adopt a depreciation period of as short as 4 - 5 years for their own fund raising so that such funds can be used to build up their internal reserves.

Based on the information established within the context of the present Study, the stance of owners of concentrating on improvement of the financial strength prior to making any decision on borrowing or investment in equipment appears to be appropriate.

(9) Procurement by Supporting Industries

The state of procurement at the 103 SI companies which were visited during the first field survey for the simple diagnosis was investigated.

1) Ratio of Procurement Cost in Annual Turnover

Fig. 2-6 shows the ratio of the procurement cost in the annual turnover for 50 companies for which the relevant figures were available.

- Although the average figure is 38.6%, there are two groups: one with a high procurement cost ratio and one with a low procurement cost ratio.
- Those companies with a low procurement cost ratio receive materials free of charge from their parent companies and only procure a small volume of secondary materials themselves.
- Those companies with a high procurement cost ratio purchase materials from their parent companies while procuring a small volume of secondary materials themselves.
- Those companies with a procurement cost ratio at a level of 30 – 40% which signifies their independent status account for one-quarter of all companies.

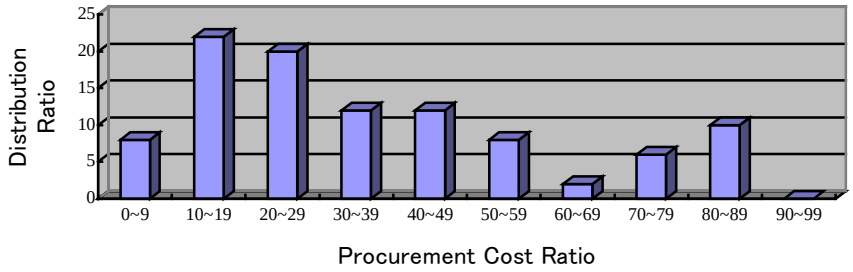


Fig. 2-6 Ratio of Procurement Cost in Annual Turnover

2) Procurement Items and Suppliers

- Wide-ranging items are procured depending on the business type of the SI. While there are no dominant/characteristic items, raw materials are the main items.
- Items requiring high quality tend to be imported from Japan and other countries.
- Chinese-run SI have a route to obtain supplies from Taiwan.
- Not many companies have multiple supply sources for the same item.
- Even though the required quantity is small, a minimum order quantity is required, resulting in over-procurement.
- There is a tendency to purchase large quantities of materials when business is good in order to reduce the amount of profit to reduce the tax and to use the surplus materials when business is poor. Therefore, the trading volumes do not necessarily reflect the real demands.

The photographs on the next 2 pages show good and bad examples observed during the simple diagnosis.

Photographs Showing
Bad Practices at
SI Companies

① The products as well as half-finished products are stored in a disorderly manner as the storage boxes do not indicate either the contents or the quantity.

② The dies are placed directly on the floor. The absence of work tables means that workers are forced to adopt an uncomfortable posture.

③ Everything is placed in such a disorderly manner that the required materials cannot be found.

Photographs Showing
Good Practices at
SI Companies

① The work space and safety passages are clearly divided by fencing and lines to establish safe areas.

② The dies are stored in an orderly manner using pallets and colour-coded customer designations.

③ The coils are stored in an orderly manner so that they can be easily transported by a forklift when required.

2.7 Present Situation of SMI Support System Related to Human Resources Development in Penang

2.7.1 Present Situation of Human Resources Development

(1) Pre-Employment Vocational Education and Training

The vocational education and training situation in Penang for young people who have completed ordinary education but who have not yet found employment is shown in Table 2-20 using the four most representative organisations as examples.

The PSDC has an excellent record of training skilled workers with the cooperation of MNCs. The training centre run by the PERDA/MARA has only a short history of training and lacks the necessary system to educate technicians with advanced electrical and electronic skills. Both the Politeknik and the JMTI were recently established and it is hoped that they will contribute to industrial development in the coming years.

Table 2-20 Situation of Vocational Education and Training at Selected Organisations

Organisation	Characteristics	Courses
Training Centre of PERDA/ MARA	- Jointly run by the PERDA and the MARA. - The subjects are Bumiputra companies. - Six month courses are held twice a year, except for a full-time diploma course. - The equipment operating cost and the personnel cost are paid by the PERDA while the cost of the trainers is met by the MARA. The trainees are paid RM 100/month.	- Nine courses on mechanics, electrics, OA, ironwork, air-conditioning, batik-craft, plastics, multi-media and computer mechanics and a diploma B-tech course - 30 – 40 trainees are accepted for each course. - 500 students are trained each year.
PSDC (Penang Skills Development Centre)	- Run with the guidance of the State Government of Penang with the cooperation of MNCs and local companies. - 50% of the trainees are of Chinese origin and 50% are of Malay origin. - Certificate, diploma and apprenticeship courses are provided.	- Six month courses on plastic injection moulding and others are provided. - One year courses on basic machining, etc. - Diploma courses on electrics, electronics, mechanics/mechatronics, mechanics/manufacturing and precision moulding, etc. are provided. - Apprenticeship courses on industrial machining and mechatronics, etc. are provided.
Politeknik Seberang Perai	- The school is governed by the Ministry of Education. - Opened in 1998. - Certificate courses and diploma courses are provided. - The school has 1,200 male and 1,800 female students, most of which are Bumiputra.	- Three subjects: commerce, mechanics and electrics - The electrics course includes computer systems. - 1,000 students per subject
JMTI (Japan-Malaysia Technical Institute)	- The school is run by the Ministry of Human Resources. - Assisted by a JICA technical cooperation project. - Temporarily opened in Kuala Lumpur in 1998 and moved to Penang in the spring of 2000. - Diploma courses for four subjects are provided. - Eight advisors and senior volunteers are dispatched by the JICA.	- Four subjects: Electronic engineering Computer engineer Manufacturing engineering Mechatronics engineering

(2) Post-Employment Education/Training and Human Resources Development

There appear to be many cases of workers and technicians, etc. leaving their jobs to obtain higher qualifications at higher educational establishments. In contrast, there appear to be few opportunities for those in employment to undergo systematic education or training to upgrade their skills while retaining their jobs. Although advertisements for evening courses at private colleges are seen in the newspapers, public organisations appear to be less active in this field.

In general, those companies which send their workers to training courses can receive a grant when approved by the HRDF. Many of the retraining courses provided by public organisations are held for a short period of several days on specific themes. The short training courses provided by various organisations in Penang are compiled in Table 2-21.

Table 2-21 Short Training Courses for Workers in Employment

Organisation	Training Subjects	Frequency	Remarks
PSDC	Automation, information technology, calibration, surface mounting technology, mechanics, quality, productivity, safety, human resources management, report writing and sales, etc.	37 courses in the four month period from March to June, 2000; mainly in English but some courses are in Malay.	In-house programmes are also available at the request of companies.
FMM-IM (FMM Institute of Manufacturing)	Human resources management, administration, quality system and quality control, production control, process control, purchasing, stock, sales, safety and languages (English and Japanese)	63 courses in the six month period from January to June, 2000; mainly in English but some courses are in either Malay or Mandarin.	In-house programmes are also available at the request of companies (Mandarin programmes are in preparation).
NPC (National Productivity Corporation)	Quality management, productivity management, human resources management and production management	14 training courses in a one year period (2000) in addition to a total of eight workshops and conventions	In-house programmes are also available at the request of companies
SIRIM Training Services	Quality and technologies (CAD/CAM, mould design and manufacturing, etc.) All held in Kuala Lumpur	In 2000, one seminar on ISO 9000 was held in Penang.	Only one seminar on ISO 9000 was held in 2000 in Penang.

In contrast, the Global Suppliers Programme (GSP) of the PSDC provides courses which combine several subjects based on specific concepts. Although the GSP aims at training business owners and senior managers rather than workers in employment, it is hoped that it will have positive results in the future as a programme designed to foster SMIs to constitute reliable SI for MNCs. The GSP is superior to the VDP and the ILP in that the

PSDC, i.e. the implementation body, specialises in training backed by well-prepared textbooks and other teaching materials and that the programme specifically indicates the needs of MNCs as clearly shown in the section entitled “Customer Expectations” in Module 1.

The Certificate of Manufacturing Management Course provided by the ARGI (Institute Manufacturing ARGI) is also worthy of attention although it is run by a private organisation. Both the GSP which serves business owners and senior managers and the ARGI course which serves supervisors of MNCs aim at making the trainees acquire comprehensive factory management abilities through cohesive training unlike the a la carte short training courses listed in Table 2-21. Despite the different targets of these two courses, they are especially effective to improve management abilities. These are listed in Table 2-22 as comprehensive training courses.

Table 2-22 Comprehensive Training Courses for Those in Employment

Organisation	Course	Modules	Remarks
PSDC	GSP (Global Supplier Programme) (CoreCom 1)	Customer Expectations 5Ss Housekeeping Statistical Process Control Calibration and GR+R Design of Experiments 6 Step Problem Solving Basic Management Courses	- Developed and run with the cooperation of European and American MNCs in Penang based on the concept of making local SMIs global suppliers. - CoreCom 1 lasts for a total of 9.5 days in a four month period at a cost of RM 1,900. - IS2 lasts for a total of 7.5 days in a four month period at a cost of RM 1,500. - Higher courses are being developed. - Highly evaluated and assisted by the SMIDEC.
	GSP (Global Supplier Programme) (IS2)	An Appreciation of QS 9000 GR+R FMEA DOE Excel Statistical Software	
	SSP (Services Supplier Programme)	Customer Service Time Management Presentation Skills Effective Meetings Structured Problem Solving Project Management	- The course lasts for a total of four days in a two month period at a cost of RM 600 and is run based on the same concept as the GSP.
ARGI	Manufacturing Management Course	Leadership & Interpersonal Skills Shopfloor Management Production Planning Total Quality Control Industrial Engineering Environment, Health & Safety	- Mainly serves employees (supervisors) of large companies with a course fee of RM 3,350. - Each course lasts six months (130 hours, usually in the evening). - Many are held in-house.

Some vocational training organisations, such as the Politeknik and the JMTI consider the retraining of those in employment and continuous education part of their training auties in addition to pre-employment vocational training.

In the case of the Politeknik for example, it promotes a programme called “Time-Sector Privatisation” (TSP) to develop a cooperative relationship with industries. To be more precise, the TSP offers skill training and apprenticeship training on such subjects as technologies, computers, quality, productivity, management and information at weekends, weekday evenings and holidays on behalf of private companies and public organisations.

The JMTI has the Engineering Consultancy Service, the status of which is equivalent to the Faculty of Engineering Technology, which is engaged in full-time education and training and this service is also responsible for continuous skill training.

Both the Politeknik Seberang Perai and the JMTI located in Penang are young institutions and their priority is to consolidate the guidance system for full-time trainees. As such, the consolidation of retraining (upgrading training) for those in employment is believed to be a pending task for both institutions.

2.7.2 Related SMI Support Systems

(1) Seminars

The activities of the FMM (Federation of Malaysian Manufacturers) include seminars, the dispatch of trade missions and exhibitions (trade fairs) and its Northern Branch conducts activities in collaboration with the PDC and the PIKS. Meanwhile, the PERDA organises basic business seminars for Bumiputra entrepreneurs. The Centre of Excellence (COE) of the PSDC holds Tea Talks every month and invites the top executives of its member companies. The available seminars and other learning opportunities for business owners and entrepreneurs are shown in Table 2-23.

Table 2-23 Seminars, etc. for Business Owners and Entrepreneurs

Organisation	Description	Frequency
FMM	Seminars on such themes as finance, economics, export and SMIs policies inviting government officials, bankers and other appropriate persons as guest speakers	Target: monthly
PERDA	20 courses on business basics (book-keeping, accounting, marketing and production control, etc.) for Bumiputra entrepreneurs	Two or three times a month for three days (Friday, Saturday and Sunday) each
COE PSDC	Tea Talks on such themes as HRD, IT, leadership, organisation and R & D, etc. inviting the top executives of member companies as guest speakers	

(2) Trade Missions and Exhibitions

Many SMI owners in Penang join a trade mission organised by the FMM. Meanwhile, the SMIDEC organises the SMI Showcase every year in Kuala Lumpur, attempting to provide a bridge between MNCs as users and SMIs as suppliers. This Showcase attracts many SMIs in Penang for the presentation of their products. In September, 2000, the SMIDEC held the SMIDEX 2000 at the Malaysia International Exhibition and Convention Centre (MINES) in which 226 companies participated. Some of the participating MNCs in the electrical and electronics industries showed a colour-coded display of their efforts to boost local procurement by means of classifying components/parts into those already supplied by local companies, those for which local procurement efforts are in progress and those supplied from overseas. There was a favourable reaction to this display on the part of the visitors.

The PERDA also organises a trade fair of the products of Bumiputra companies every year. This exhibition in 1999, lasting for six days, was held at the PISA (Penang International Sports Arena) in October. Up to 120 booths were set up and 2,000 people visited the exhibition which covered wide-ranging businesses, from food processing, plastics, computers, IT and machinery to import/export.

The various trade missions and trade fairs are summarised in Table 2-24.

Table 2-24 Trade Missions and Trade Fairs

Organisation	Type of Event	Description	Frequency
FMM	Dispatch of trade missions	Trade missions have so far been dispatched to China, Germany and Cambodia, etc.	Once or twice a year
SMIDEC	Trade fairs (Showcase)	Held in Kuala Lumpur every year; many SMIs in Penang participate	Annually
PERDA	Trade fairs (Showcase)	Held at the PISA (Penang International Sports Arena); participants are Bumiputra companies	Annually

(3) Consultations

Consultation services for SMIs do not appear to be very active except those for the certification of ISO 9000 status, etc. As even public organisations charge a high consultation fee of RM 1,000 – 3,000/day, however, SMIs owners appear reluctant to pay such a high fee for an intangible consultation. Table 2-25 shows the consultation activities of various organisations.

The SIRIM provides technical consultation services at its 13 Technology Centres in Kuala Lumpur. In theory, it is possible for SMIs to use these services to solve their technological problems. In practice, however, their use appears impossible because of geographical restrictions and the rather inhibiting procedure, etc. The situation at other organisations appears to be similar. The visits to SMIs found hardly any examples of the use of consultation services except that to obtain ISO certification.

While the Engineering Consultancy Services Section of the JMTI plans to provide a technical consultation service, this is still at the preparatory stage as the JMTI itself was only recently established. The Politeknik also has plans to provide a consultation service to assist local SMIs but further efforts will be required to materialise such an effective consultation service in the future.

In regard to consultations regarding ISO 9000, the ITAF3 provides a subsidy for the consultation fee for productivity or quality improvement or for the acquisition of ISO 9000 certification. The technical aspects are dealt with by the NPC and the MTDC. Consultation services for ISO 9000 and ISO 14000 are fairly active with more than 1,000 companies having used these services.

Although there is no clear picture of the level of consultation fees, public organisations and private consultants charge RM 1,000 – 3,000/day and RM 5,000/day respectively according to one source.

Table 2-25 Consultation Services of Various Organisations

Organisation	Relationship with Higher Organisation	Situation of Consultation Services
SMIDEC	–	- Subsidy under the ITAF schemes for the consultation cost: ITAF1 (business planning), ITAF2 (product development and process improvement), ITAF3 (productivity and quality improvement and ISO certification) - Consultations under the Factory Auditing Scheme - Consultations by the Business Clinic at the Head Office in Kuala Lumpur
COE	Part of the PSDC	- Consultation services on TQM, TPM, ISO, HR, finance and organisation, etc. for SMIs - Has a contract with some 30 consultants
DCT Consultancy Services Sdn. Bhd.	100% subsidiary of the PDC	- Consultations relating to development projects of the state government and others
NPC	–	- Consultations on quality and productivity, etc. - Assistance for the acquisition of ISO certification under the ITAF3 - Model consultations on five year TQM introduction plans - Consultants are invited from the Head Office as required
SIRIM	–	- Technical surveys and consultation services provided by its 13 Technology Centres - Joint venture: Malaysian Technology Consultant Sdn. Bhd.
Usains Holding Sdn. Bhd.	100% subsidiary of the USM	- Technical consultation services by USM (Universiti Sains Malaysia) experts
ARGI Management Consultants Sdn. Bhd.	–	- Sister company of Institut Manufacturing ARGI - Business consultation services
MTDC	–	- Technical consultation and support services: commercialisation of technology, evaluation of technology, productivity improvement and patent application - Assistance for the acquisition of ISO certification under the ITAF3

(4) Technical Services of USM and Related Organisations

Although Usains Holding Sdn. Bhd., a 100% subsidiary of the USM (Universiti Sains Malaysia), was only established in 2000, the Innovation and Consultancy Centre, USM, its predecessor, had an active history of 20 years, providing consultation services at the point of contact between the university and industrial circles. Usains conducts wide-ranging businesses, including consultation services in various fields, testing (including common testing as well as testing of a developmental nature), consigned R & D, short

training courses, continuous education based on the USM's programmes, incubation work for joint development, marketing of the USM's research results and patents owned by the USM, joint ventures with high-tech companies and technology transfer to private companies. While Usains receives applications from companies and concludes and manages contracts, the actual implementation of the consultation services, etc. is conducted by experts/researchers of the USM's relevant faculties. In other words, Usains does not have exclusive testing equipment and staff of its own for incubation purposes and its responsibility lies with management. The equipment owned by the university is used for the services provided for companies and university researchers conduct the necessary work on a contract basis together with their educational and research activities.

The results of the USM's services have not yet been clearly disclosed. To the question regarding the Usains consultation fee, citing the level of RM 1,000 – 3,000/day charged by public organisations, the reply by Usains is that it charges a lower fee.

2.8 Current State of Physical Distribution System in Penang

It has been pointed out that there is a possibility that undeveloped or defective physical distribution systems can impede the localisation of procurement by MNCs and the procurement of high quality raw materials and parts by SI.

During the field survey period, the Study Team visited 103 SI companies for which the simple diagnosis was conducted, 10 Japanese MNCs, three European/American MNCs and two large local companies to establish a reliable picture of physical distribution. In addition, the Study Team visited distributors, transporters, airports and ports to clarify the current business conditions. Furthermore, the Study Team visited Singapore to conduct a third country survey in order to investigate the conditions of the physical distribution business in Singapore which is the centre for physical distribution in the ASEAN region.

The visits to European/American MNCs described in 2.4 did not find any particular problems relating to physical distribution. However, the fact that many products are sent abroad by air cargo not only from Penang Airport but also from Kuala Lumpur and Singapore Airports after transportation by road to these airports implies a lack of the necessary air cargo space at Penang Airport.

(1) Findings of Visits to Distributors and Transporters

This part of the survey was conducted by visiting electronic parts traders, material traders and transporters in Penang and two Japanese subsidiaries in Singapore selling their products in Malaysia.

(2) Present Situation of Electronic Parts Trading

As of May, 2000, there is a global shortage of resistors, condensers, inductors and ICs, etc. because of the insufficient production capacities of these products to meet the planned massive production increase of mobile phones worldwide (planned increase to double the production volume from 200 million units in 1999 to 400 million units in 2000). Because of this shortage, a situation is emerging where parts are failing to reach the production lines of not only mobile phones but also all types of electronic equipment.

Under these circumstances, parts manufacturers have begun to demand an extension of the delivery date and a price increase and the present conditions are unsuitable for the promotion of SCM (supply chain management). While set makers are trying to deliver their products by air to abide by the final delivery date, they are forced to use the more expensive DHL and FedEx flights because of the lack of extra cargo flights at Penang Airport.

Because of the use of expensive cargo flights, set makers operating in Penang tend to demand a substantial shortening of the delivery period and cost reduction to SI to alleviate the adverse impacts of the tight parts supply.

2.8.1 State of Physical Distribution in the Study Area

(1) Air Cargo

The overseas air cargo handling volume at Penang Airport which used to record annual growth of approximately 20% became stagnant in 1999 as shown in Table 2-26 and Fig. 2-7. This is not because of the lack of cargo growth but is simply the result of the lack of additional cargo flights. Exporters are, therefore, forced to transport their products by truck to Kuala Lumpur and Singapore. This situation has led to a longer transportation time as well as a higher cost. For reference, the domestic air cargo (mainly between Penang and Kuala Lumpur) handling volume in 1999 showed an increase of 210% on the previous year. The lack of additional cargo flights is a result of the flight concentration to the newly opened Kuala Lumpur International Airport (KLIA).

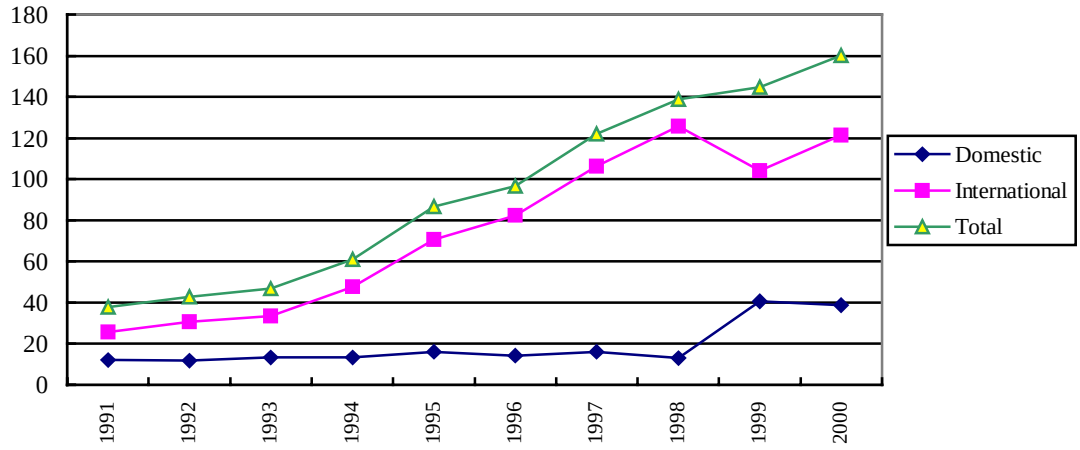
All air cargo at Penang Airport is stored in the warehouses of Malaysian Airlines except for cargo handled by DHL which has its own warehouse. However, the facts that the warehouses are quite old and that the cargo is mainly handled by unskilled foreign workers cause such problems as rainwater and other damage and a loss of cargo. However, according to Penang Airport Company, a new cargo terminal is due to be completed at the end of 2000.

Table 2-26 Annual Cargo Handling Volume at Penang Airport (1991 – 1999)

(Unit: '000 metric tons)

Year	Domestic			International			Total		
	Weight	Year-on-Year Change	Year-on-Year Change (%)	Weight	Year-on-Year Change	Year-on-Year Change (%)	Weight	Year-on-Year Change	Year-on-Year Change (%)
1991	12.06			25.72			37.78		
1992	11.84	-0.22	-1.8	30.78	5.06	19.7	42.62	4.84	12.8
1993	13.21	1.37	11.6	33.42	2.64	8.6	46.63	4.01	9.4
1994	13.38	0.17	1.3	47.58	14.16	42.4	60.96	14.33	30.7
1995	16.13	2.75	20.6	70.70	23.12	48.6	86.83	25.87	42.4
1996	14.16	-1.97	-12.2	82.37	11.67	16.5	96.53	9.70	11.2
1997	15.96	1.80	12.7	106.21	23.84	28.9	122.17	25.64	26.6
1998	13.07	-2.89	-18.1	125.73	19.52	18.4	138.80	16.63	13.6
1999	40.63	27.56	210.9	104.08	-21.65	-17.2	144.71	5.91	4.3
2000*	38.65	-1.98	-4.9	120.14	16.06	15.4	158.79	14.08	9.7

Note : The figures for 2000 are estimates by the JICA Study Team based on the actual figures for January-August.
Source : Malaysia Airport



*2000 is estimated by JICA Study Team
Source: Malaysia Airport

Fig. 2-7 Cargo Handled Per Annual in Penang Airport 1991-2000

(2) Shipping

During the field survey, a member of the JICA Study Team was allowed to attend the Penang Port Users' Meeting as an observer to learn more about the situation at Penang Port. As shown in Table 2-27 and Fig. 2-8, the cargo handling volume at Penang Port has almost recovered to the pre-economic crisis level. However, there are problems in regard to container transportation which has been the driving force of shipping growth and which accounts for half of the cargo handling volume.

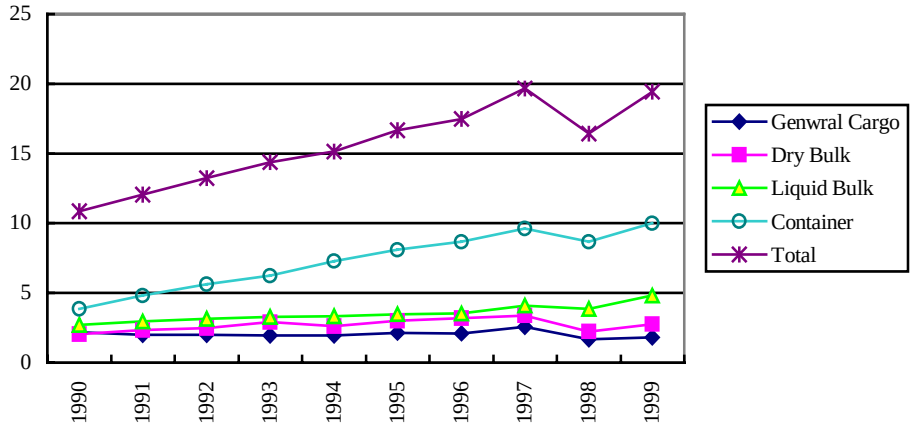
Firstly, breakdowns and inspections of the container cranes lengthen the unloading time, resulting in complaints from consignors and forwarders. Secondly, there are two container terminals, i.e. BWCT (old) and NBCT (new). As it is unknown which terminal a container ship will come alongside until the last few hours because of the above-described situation, the advance delivery of containers is difficult. Thirdly, the narrow container yards make the advance delivery of containers difficult in addition to the difficulty of finding space for empty containers.

Table 2-27 Cargo Handled at Penang Port (1990 – 1999)

(Unit: million freight tons)

Year	General Cargo	Dry Bulk	Liquid Bulk	Container	Total
1990	2.21	2.06	2.73	3.85	10.85
1991	2.02	2.31	2.94	4.79	12.06
1992	1.99	2.46	3.14	5.63	13.22
1993	1.96	2.90	3.28	6.22	14.36
1994	1.93	2.60	3.31	7.29	15.14
1995	2.12	2.99	3.46	8.10	16.67
1996	2.11	3.20	3.52	8.67	17.50
1997	2.59	3.37	4.11	9.62	19.69
1998	1.67	2.23	3.86	8.69	16.45
1999	1.83	2.74	4.82	10.01	19.42

Note : The figures for 1999 are estimated based on the figures for January-November.
Source : Penang Port Sdn. Bhd.



Source: Penang Port Sdn Bhd

Fig. 2-8 Cargo Handled at Penang Port

(3) Road Transportation

Containers are transported by road as far as Singapore and Bangkok. The road transportation volume to Thailand is said to be steadily increasing as it is no longer necessary to reload cargo at the border. Even though companies which specialise in the handling of small cargo appear to exist, their details are unknown because of their exclusion from the scope of the Study.

For the efficient delivery of small cargo, the clear identification of the delivery address is necessary so that an efficient delivery route can be determined in advance. However,

addresses in Penang are not systematically arranged as experienced by the field survey team during the visits to 100 local companies. The fact that an address can seldom be found without telephone guidance is a disadvantage. Improvement of the local address system is, therefore, required.

2.8.2 Physical Distribution of Raw Materials and Parts

(1) Physical Distribution of Steel

Many types of shaped steel and bar steel, including that made in Malaysia, are available in the domestic market although sheets and wires for the electrical and electronics industries are mainly imported from Japan. There are several steel centres in which Japanese trading houses participate and the situation of inventory and trading is similar to that in Japan. Special steels are almost exclusively imported. Because of the low demand level for each of a large variety of products, the inventory level of each products is rather low, sometimes necessitating a long delivery time. As the small volume of orders from SMIs do not reach the ordinary quantity of orders expected by suppliers in Taiwan, Japan, Germany and Sweden, etc., it is necessary for orders to be delivered by air cargo, causing problems in terms of the cost and delivery of subsequent products to customers.

As SI for Japanese, American and German MNCs demand the use of JIS, ASME/ASTM and DIN respectively as steel standards, it is necessary for suppliers to translate the different standards in order to recommend equivalent products to SI. However, SI may be unable to judge the suitability of alternative products in some cases and delivery is delayed until the suitability of alternative products has been clarified with MNCs. This indicates the necessity for SI to improve their level of technical knowledge so that they can select suitable materials based on a proper understanding of their applicability.

Compared to the physical distribution channels in Japan, those in Malaysia are shorter because of the involvement of fewer middlemen. This implies less resistance to the distribution revolution by IT in the future and the quicker achievement of reform of the distribution sector depending on the correct response of all concerned.

(2) Plastic Materials

In Penang, a wide variety of engineering plastic materials are used, including PMMA and PC, in addition to the more commonly used PP, ABS and other ordinary plastic materials. Most are imported from Japan, the US and Korea. As the inventory levels are sufficient, no problems in terms of physical distribution are observed.

(3) Electronic Parts

Among electronic parts and components, those supplied to set makers do not usually face any problems in terms of physical distribution as the distribution mechanisms for these regularly ordered, low cost parts in large quantities are reasonably established. However, in the case of an extraordinary situation, such as that caused by the explosive demand for mobile phones, a shortage of imported parts could occur, creating a tight supply situation.

Meanwhile, the prices of parts for equipment manufacturers and service parts for companies are relatively high because of the small quantities which are irregularly ordered. As these parts are not significantly affected by supply and demand fluctuations, there is a stable supply.

In the case of service parts, Japanese MNCs demand the supply of Japanese parts, American subsidiaries demand the supply of American parts and so on. As local subsidiaries of Japanese trading houses do not accept small quantity orders, it is necessary for companies using Japanese equipment to place direct orders to parts traders in Japan. This is not as easy as it appears because orders for Japanese parts must be placed in Japanese. In contrast, American parts can be ordered even in small quantities through the Internet using English and a credit card.

2.8.3 Status of Singapore

Singapore's key status in terms of finance, information and physical distribution in the ASEAN region is firmly established. The export amount of S$ 194.3 billion and import amount of S$ 188.1 billion in 1999 showed a return to the pre-currency crisis level. The state of international trade in Singapore is shown in Table 2-28 and Malaysia is clearly an important trading partner.

Table 2-28 Main Trading Partners of Singapore and Trade Share by Region (1998)

Rank	Exports		Imports	
	Country/Area	Share (%)	Country/Area	Share (%)
1	USA	19.9	USA	18.4
2	Europe	18.0	Japan	16.7
3	Malaysia	15.2	Europe	15.9
4	Hong Kong	8.4	Malaysia	15.5
5	Japan	6.6	China	4.8

Source: JACTIM JB, Singapore Investment Study Team Report (December, 1999)

(1) Traders of Electronic Parts

Local traders of electronic parts obtain parts from all over the world, taking advantage of the status of Penang Port as a free port and supply these parts to the electronics industry in ASEAN countries.

One of the traders visited obtains demand forecast data for the next six months from its overseas offices and places orders to Japan, Taiwan and China, etc. at its own risk based on such data.

Orders from end users are placed three months in advance at the earliest and two months in advance on average.

The problems encountered in terms of physical distribution include the time-consuming customs clearance for imported parts, particularly on the China-Hong Kong-Singapore route, and the occasional short supply of and damage to parts.

The delivery of imported parts from Singapore to end users encounters few problems as these parts are mainly delivered to warehouses in Singapore designated by end users.

(2) Procurement by MNCs

As in the case of parts traders described above, the International Procurement Centre (IPC) of MNCs plays the function of informing a manufacturer or trader of the estimated required volume of each part based on calculation using the production plan supplied by each plant of the company so that all parts are efficiently procured. By means of placing a large order for each part, the unit price of the part is reduced.

Parts are stocked by each parts manufacturer based on its estimate in the warehouse in Singapore which is controlled by the IPC. Users take the necessary quantity of parts when needed. This constitutes concrete order placement for invoicing (consignment base).

Large factories can place large orders by themselves. They place large orders directly to manufacturers to save the extra cost incurred by the use of the IPC.

Consequently, the function of the IPC is changing from the control of goods and information to the control of mainly information, facilitated by the rapid spread of Internet technology.

(3) Material Traders

In the case of material traders, front-line staff members have moved to consumption areas in Malaysia and Indonesia, etc. (locations of manufacturing plants) and Singapore has become the base for information control. Accordingly, the number of Japanese staff of traders located in Singapore is showing a declining trend as their operation is gradually being taken over by local employees.

2.8.4 Current State of Physical Distribution System in Penang

The physical distribution system is a service system which effectively links manufacturing with sales by means of transportation. The quality of the system determines whether or not economic activities smoothly develop. The current state of the physical distribution system in Penang is summarised below based on information obtained by the field survey.

< MNCs >

There are no major problems in regard to the raw material supply system for MNCs. In many cases, Japanese trading houses and other large traders provide the necessary physical distribution service.

Although there is a problem of the air cargo handling capacity to deal with the products of MNCs for export, measures to solve this problem, including the construction of a new cargo terminal, are currently being implemented.

As most of the production equipment of MNCs consists of foreign products, it is necessary to import service parts. MNCs tend to have a relatively high inventory level of these parts for their quick supply in order to maintain equipment operation.

< SI >

Apart from SI manufacturing parts for mass-produced products, the order quantity from individual SI is naturally small.

Because of the small order quantity, each SI tends to rely on a single parts supplier.

< Retailers >

Most retailers of materials and parts for SI are small. While there are many retailers, their linkage is weak.

The level of use of IT by parts retailers is generally low and tends to be confined to accounting only.

The physical distribution system in Malaysia does not have a multi-step structure such as that in Japan and, therefore, should allow a distribution revolution with relative ease.

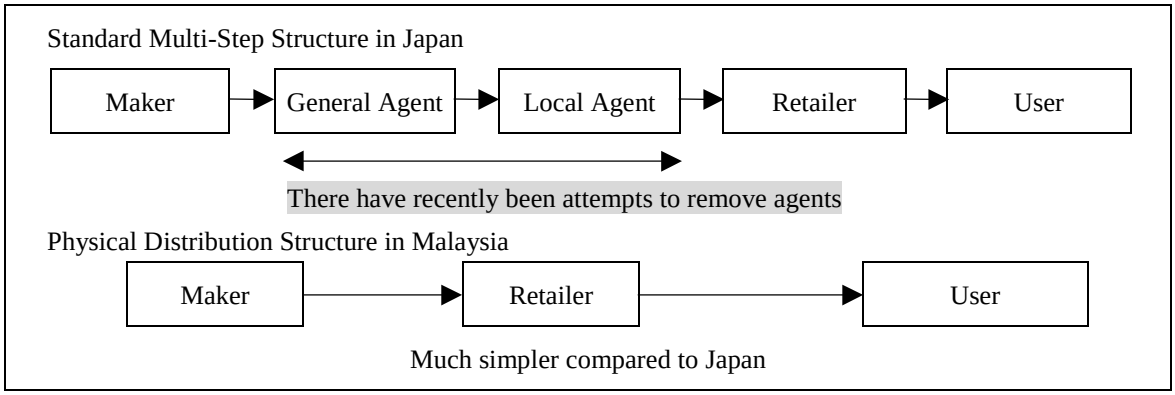
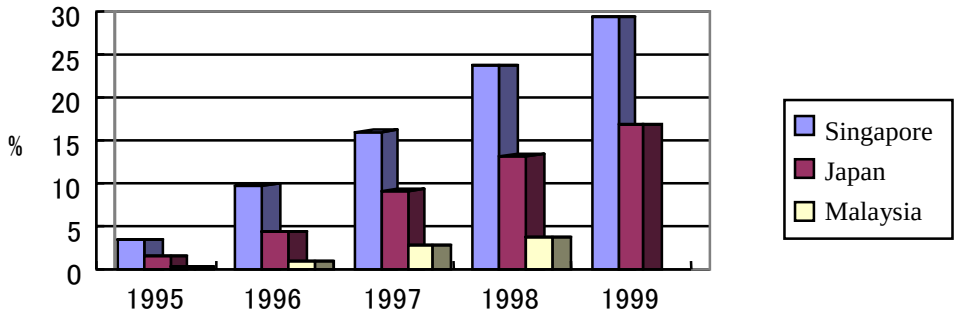


Fig. 2-9 Structure of Physical Distribution in Japan and Malaysia

2.9 Present Situation of IT in Penang

2.9.1 Present Situation of IT

The global export value of computers and peripheral equipment in 1999 was as huge as US$ 291.7 billion. As Malaysia exported US$ 16.96 billion, featuring mainly hard disk drives (HDD), or 5.8% of the global export value, it can be considered to be a major exporting country.[4] However, the diffusion rate of Internet access in Malaysia in 1998 of 3.68% was far behind that of Singapore with 23.70% which was as advanced as the US.[5]



Source: Sakura Research Institute, RIM, No.50

Fig. 2-10 Historical Changes of Diffusion Rate of Internet Access

[4] JETRO Sensor, December 2000, JETRO
[5] Sakura Research Institute, RIM, No.50

In order to not only catch up with other countries but also to make Malaysia an advanced country in terms of IT application, the Government of Malaysia is providing strong guidance to proceed with the Multimedia Super Corridor Programme. Although Penang is not part of the planned area, the State Government of Penang is hoping to secure a branch line to facilitate an IT revolution in Penang.

The SMIDEC has established the E-Commerce Grant to assist the use of IT by SMIs and financial assistance is provided to cover the cost of registration and operation at the portals shown in Table 2-29 and the consultant service fee.

Table 2-29 Designated Portals by SMIDEC

MTEX	Malaysian Trade Electronic Exchange	www.mtex.com.my
MyBiz	MyBiz Malaysia Sdn. Bhd.	www.mybiz.net.my
AsiaEP	Asia E-business Partner	www.asiaep.com.my
Xchange	CY Multimedia Lab Sdn. Bhd.	www.xchange.com.my
SMI Forcus		www.smifocus.com
SMI Commerce		www.smicommerce.com
Halale World		www.halaleworld.com
NiagaOne	KUB Sistem Sdn. Bhd.	www.niagaone.com
SMI portal	Asia Electronic Publication	www.smiportal.com
MOL	MOL.Com Bhd	www.mol.com
Tradenex	Tradenex.com Sdn Bhd.	www.tradenex.com
DagangAsia	DagangAsia	www.dagangasia.com
e-Buildestreet		www.ebuilderstreet.com

Source: SMIDEC Home Page (February, 2001)

In Penang, 52 out of the 103 companies (50.4%) for which the simple diagnosis was conducted expressed a willingness to be listed on the matchmaking page of the Business-to-Business (B to B).

As of February/March, 2000, 73 out of the 103 companies (70.1%) had an e-mail account which was held under the company name. Ten companies (9.7%) had their own home page. In June/July, 39 out of 52 companies (75%) were found to have an e-mail account and eight companies (15.3%) had their own home page.

Even though the populations differ, the ratio of companies with an e-mail account and a home page increased by some 5% in just 3 – 4 months. The fact that two companies showed their draft home page to the Study Team during the visit suggests the rapid expansion of IT application in Penang.

E-Business by Penang-Net, which is the local portal in which the PDC has invested, has commenced administrative agency work where by e-Business receives electronic orders from MNCs and large companies on behalf of SI companies and outputs the necessary delivery notes and invoices in line with the formats used by large companies.

- Situation of IT Utilisation at SI Companies

  All of the companies subject to the simple diagnosis or model companies use a personal computer(s) for company management, including production control, process control, quality control and business management. The scope of computer use, however, has remained at the classification and totalisation of data and the partial analysis of such data. The present level of use has not yet reached the stage of creating a total system where effectively totalised and analysed information and data are used for the planning and formulation of business management, management policies, target profit and business plan, etc. Most SMI owners use a mobile phone, partly because of the limited availability of telephone lines and partly because of the high level of marketing and other activities outside the company.

2.9.2 Support for Information

For the purpose of assisting the information service to facilitate matchmaking between SI and MNCs and to strengthen the linkage between companies, proposals were made to the PDC regarding the opening of a home page carrying information on SI companies and also on the planned provision of an access service for various types of information as part of the Study and assistance was provided for the actual implementation of the proposals.

(1) Matchmaking Home Page

The proposal regarding a matchmaking home page, prepared by the Study Team in Japan in advance, was explained to the Steering Committee at the time of the First Field Survey.

The PDC selected the Penang Network Service (Penang Net; the PDC owns 30% of the shares), which operates the home page of the PDC, as the body to handle the proposed home page.

The Study Team visited the Penang-Net with the PIKS, i.e. PDC, to explain the purpose of the proposal as well as the concept of the proposed matchmaking home page.

The Penang-Net is developing a system called “the e-SMIs”, commissioned by the PIKS, for SI in the electronics industry. This e-SMIs incorporates the idea of “a matchmaker”.

It was agreed that the contents of the e-SMIs would be expanded by incorporating the contents of the Study Team’s proposal. To be more precise, the following targets were agreed.

- Appointment of a co-ordinator
- Addition of an automatic e-mail reply function
- Addition of a regular updating demand function in response to e-mail and on-line modification functions
- Mutual search function between SI and MNC databases

It was agreed that data on 52 companies which expressed a wish to be listed on the home page among the 103 visited companies would be provided via the PIKS. The Study Team requested the PIKS’ provision of this service free of charge and this request was accepted.

During the Second Field Survey period, a visit was made to the Penang-Net which is responsible for the running of the matchmaking home page to clarify the state of progress. The development of a software had progressed to the stage of on-line testing. The simple input method proposed by the Study Team was employed for matchmaking.

As the home page created by the Penang-Net was still in the process of development, modifications can be made prior to its finalisation.

The basic shape of the resources guide was also completed (see e-SMIs initiative of the Penang-Net). The home pages of financial institutions so far created were linked together with the introduction of the said institutions so that users have immediate access to the home pages of other financial organisations.

At the third S/C meeting, the PIKS was requested to obtain the required data for the target launch of the resources guide at the end of September. A request was also made to

the representatives of various organisations attending the meeting to cooperate with the collection of data.

In regard to the 52 companies which expressed a wish to be listed on the home page out of the 103 companies visited for the simple diagnosis during the First Field Survey period, an e-mail and fax was sent to each of these 52 companies to obtain missing data and to confirm the authenticity of the input information. Based on the replies, the home page data was updated and provided to the Penang-Net in the form of F/D via the PIKS.

However, the PDC informed the Study Team at the third of the Third Field Survey that the entire e-SMIs plan was delayed due to a change of the management at the Penang-Net and that the new people to be in charge of the plan to replace those who had resigned had not yet been appointed.

The Study Team visited the Penang-Net and requested that the newly appointed marketing manager convene a meeting with the PIKS with a view to re-examining the development schedule which should then be duly informed to the Study Team.

(2) Resources Guide

In addition to the matchmaking home page, a proposal was made to establish a resources guide to enable SMIs to quickly and easily obtain the required information.

It was requested that the resources guide should emphasise easy access to the required information by users instead of one-sided advertisements by information suppliers.

While similar plans are in progress elsewhere, useful contents would decide the value of the resources guide. If the resources guide constituted a simple brochure of products, users would not find it attractive enough for repeated access. Unless the resources guide had such attractive features as a dictionary or encyclopaedia to make users repeatedly access it to obtain useful information, SI would not pay to become members. It was decided to provide further advice on the consolidation of the resources guide.

While the programme was being developed by the Penang-Net, it was necessary to gather data separately from the programme development work. The participants of the third S/C meeting were, therefore, requested to provide data for the resources guide.

As in the case of the matchmaking home page, work on the resources guide was also interrupted by the resignation of certain key personnel at the Penang-Net.

Consequently, the contents of the resources guide attached to the present Report are restricted to those independently surveyed by the Study Team. While a search function is lacking, it is configured to allow easy access to data on the Internet using a hyper-link.