

Sourcing Practices of Manufacturers in the Malaysian Electronics and Electrical Products Industry

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ABSTRAK

Objektif utama kajian ini ialah untuk mengenalpasti amalan pembekalan dalam industri elektrik dan elektronik di Malaysia. Hasil kajian mendapati pembuat bergantung kepada pembekal tempatan untuk bahan pembungkusan, bahan bercetak, alat logam, dan bahan kimia, tetapi tidak untuk 'chassis' televisyen dan alat perakam video. Hasil kajian juga mendapati harga, penghantaran keluaran dan kualiti adalah tiga faktor utama yang dipertimbangkan dalam pemilihan vendor. Pembuat pada keseluruhannya adalah lebih berpuashati dengan vendor luar negara dan adalah agak berpuashati dengan vendor tempatan untuk aspek syarat pembiayaan, penyelenggaraan dan perkhidmatan lepas jualan. Untuk lebih bersaing, adalah disarankan untuk pembekal tempatan mengutamakan penyelidikan dan pembangunan, kualiti keluaran dan perkhidmatan yang baik.

ABSTRACT

The main objective of this study was to identify the sourcing practices currently followed in the electrical and electronics products industry in Malaysia. The findings show that the manufacturers rely on local vendors for material inputs for packaging printed material, metal parts and chemicals but not for TV and VCR chassis. The study also found that price, product delivery and quality are three major factors considered in the selection of vendors. The manufacturers are in general more satisfied with non-local vendors, and are quite satisfied with the local vendors' financing terms, maintenance and after-sales service. To be more competitive, it is suggested that local vendors emphasize research and development of their products. Local vendors also need to focus on product quality and consistently maintain good service.

INTRODUCTION

The manufacturing industry of electrical and electronics products forms the largest sector of Malaysian exports (Ministry of Finance). In view of this, the Malaysian government developed the Industrial Master Plan 1986-1995 (IMP) to ensure that the industry is able to produce a wide range of electrical products for both the export and domestic markets. The government is also implementing the Outline Perspective Plan 2 (1991-2000) and Vision 2020 to maintain the country's high export growth rate while reducing import dependency.

The electronics and electrical products industry are the leading industry in the manufacturing group; in 1994, it contributed 26.6% to the total output. The electrical appliance sub-sector, which includes air-

conditioners, household refrigerators and washing machines, contributed about 40% of the electrical products industry's output and exports. The output of the electronics and electrical products industries expanded by 19.4% during 1994 compared with 15.3% in 1993. Semi-conductors and other electronics components expanded by 21.5%. In the electronics industry, semi-conductor devices accounted for 58% of the total output.

Electronics and electrical products were still Malaysia's single largest foreign exchange earner in 1994, contributing 48.6% of the total Malaysian exports (*Fig. 1*). The export of these products grew by 39.4% in the first half year of 1994. This is an even more impressive export growth than the 32.2% growth registered at 1993, contributing 62.7% of the total export value of manufactured

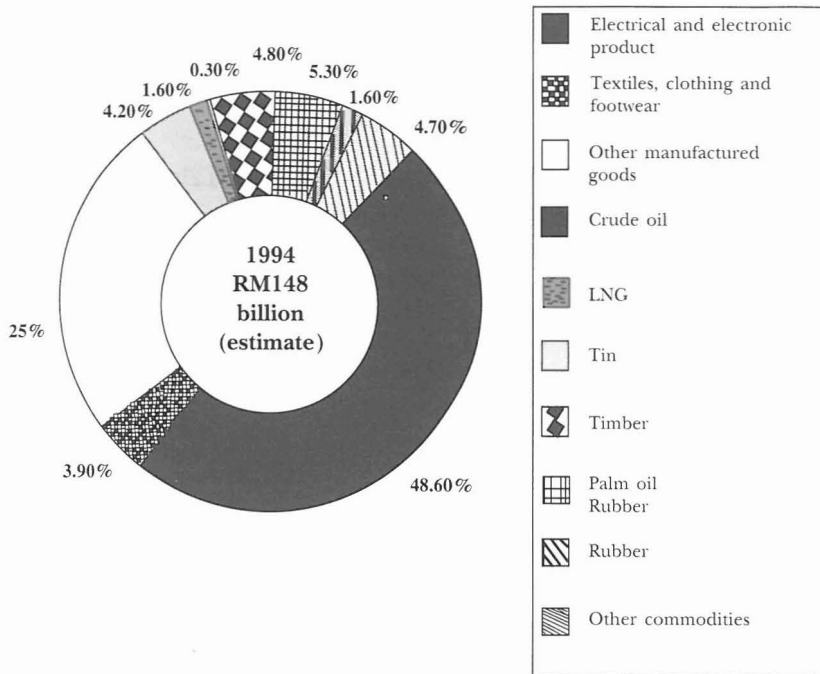


Fig 1. Malaysian export structure, 1994
 (Source: Malaysia Economic Report 1994/95)

goods. There was a strong export growth in a line of products ranging from telecommunications to electronic household goods with exports of television receivers and sound recorders increasing by 38.1% and 61% respectively. With the recovery of the US economy and the continued strong growth in other Asia Pacific countries, demand for consumer electronics has risen.

Since the 1970s, the electronics industry had been dominated by the electronic components sector, accounting for 80-85% of the sectoral output. In view of this, the Industrial Master Plan (IMP) recommended its restructuring by giving emphasis to the consumer and industrial electronics sectors. Realizing the limitations of the sector and the need to strengthen its structure, the electronics industry should diversify into the production of a wider range of electronic products to create more effective forward and backward linkages. In line with this, a number of strategies have been adopted. One of these strategies is to foster the development of supplier and support industries for the electronics industry and thereby increase linkages and local content.

In Malaysia, some of the material inputs used by the electronics and electrical products

industry were completely obtained from local suppliers. Electronic components such as resistors, connectors, capacitors, diodes and ICs were obtained from both overseas as well as from local sources. Those which were imported were usually custom designed and manufactured for a particular consumer electronics product.

Research on the performance of the electronics and electrical products industry is crucial to assess the competitiveness of local vendors compared with the non-local vendors. Currently, the competitiveness of local vendors in this industry is still not satisfactory as most of the inputs are still imported from overseas. Further development is needed to increase the competitive advantage of the local vendors of electronics and electrical components in Malaysia.

INDUSTRY LINKAGES

According to Dicken (1992), a country's economy can be developed through the creation of linkages between multinational corporations (MNCs) and the country's small and medium size industries (SMIs). In most countries there are several advantages to be gained as a result of

direct links between MNCs and indigenous firms. The advantages are: i) such links are the most significant means by which technology is transferred, additional employment created and opportunities increased for the formation of new local industries; ii) the inter-firm linkages can act as a very important channel through which technological change is transmitted as a result of the placement of orders with indigenous suppliers for materials or components which must meet stringent specifications; iii) linkages can also increase the competitiveness of indigenous firms in broader markets as a result of the experience gained, provided, of course, that the indigenous firms are not tied exclusively to a specific MNC customer; iv) a pool of local firms may be increased as the demand created will lead to the emergence of new domestic firms. Additional employment will also take place to meet the demand of the firms acting as suppliers to the MNCs whose activities have expanded because of the linkages; v) additional employment may also be created to meet the demands of firms involved in providing ancillary services such as transport and distribution to the MNCs.

Linkage formation between MNCs and local firms is, therefore, a key channel through which host countries can hope to gain meaningful and lasting benefits from the operations of MNCs. Ensuring the occurrence of beneficial linkages is a strategy that must be followed if the host country hopes to establish independent indigenous manufacturing enterprises that are able to compete in the international market place.

Mohamad Nazari (1993) reported a significant occurrence of linkages between the foreign electronics MNCs and local SMIs in Malaysia. These are in the forms of local sourcing of component parts, tools, equipment, general services and the awarding of sub-contract jobs. The factor encouraging the formation of linkages is the capability of some local suppliers to satisfy the MNCs in terms of costs, quality and delivery. However the role of MNCs in helping to promote economic development in the host country through the local sourcing of components and other supplies is, on the whole, quite disappointing. As such, it is important to continuously conduct further studies in this area to enable a proper, up-to-date and accurate assessment to be made. Local vendors have to adopt new technologies, acquire new skills and generally upgrade their capabilities to encourage

MNCs to buy from them. In other words, the crucial factor which is being considered by the MNCs is whether local sourcing will contribute towards their long term competitiveness and profitability.

Strong and viable ancillary and supporting sectors are crucial for further development of the electrical and electronics products industry in Malaysia, especially when the industry is displaying impressive growth potentials. The high rate of growth will also offer tremendous opportunities for local SMIs, which must be aware that to be competitive and profitable in the electronics industry, they may be forced to reduce their manufacturing costs and increase efficiency. One of the most important ways for them to achieve their goals is by increasing the amount of capital, equipment, spare parts as well as component input sourced locally.

THE ELECTRICAL PRODUCTS INDUSTRY

In the 1960s, with the establishment of manufacturing projects for the import substitution of household appliances, electrical fittings, wires and cables and automotive batteries, the electrical products industry was started in Malaysia. All the projects were undertaken through joint ventures with foreign partners. This industry has grown dramatically over the years and now is supplying the domestic market with a wide range of products. Furthermore, many companies have ventured into the export market and some projects have been established primarily for exports.

The electrical products industry can be divided into:

- Electrical appliances
- Wires and cables
- Dry cells and batteries
- Electric lamps and tubes, and
- Other electrical apparatus and supplies.

In 1994, the electrical products industry's output was worth about RM6.7 billion. However, Malaysia is still a net importer of electrical goods and the 1994 imports were valued at RM9.0 billion. Currently, Malaysia's main import is electrical industrial equipment. The exports of electrical products in the same period were worth RM6.1 billion. The growth of the electrical products industry is forecasted to be mainly in the industrial equipment sector in line with the continued progress in the industrialization of the Malaysian economy.

THE ELECTRONICS INDUSTRY

Malaysia's electronics industry started in the 1970s when the government shifted its emphasis from an import-substitution to an export-oriented strategy to promote Malaysia's industrial development. At that time, structural changes were taking place in the electronics production sector in the USA, Western Europe and Japan. The industries in those countries needed to adjust very quickly to the competitive international market and, inevitably, to locate some of the operations to lower cost production centres overseas. Malaysia was considered to be an ideal location. In order to welcome this opportunity, Malaysian Government established an attractive investment climate by establishing the special 10-year pioneer status for the electronics industry, offering a huge pool of low-cost trainable labour, the establishment of free trade zones (FTZs) and also licensed manufacturing warehouse facilities.

The electronics industry can be divided into three broad sub-sectors:

- Electronics components
- Consumer electronics
- Industrial electronics.

The export-oriented electronics industry has developed rapidly to become one of the Malaysia's major industrial sub-sectors within the manufacturing sector and a significant contributor to the country's economy in terms of manufacturing, employment and exports. Malaysia has become one of the largest semiconductor producers and exporters in the world. Exports of electronic products were valued at RM66.4 billion in 1994 compared with RM13.1 billion in 1988. In 1994, the electronics exports constituted 55.2% of total manufactured exports (RM120.2 billion). Malaysian electronics industry exports are expected to continue to contribute substantially towards exports, employment and manufacturing value-added in the future.

VENDOR DEVELOPMENT PROGRAMME

The vendor development programme (VDP) for the electronics and electrical products industries was established in 1992. By 1995, fourteen (14) companies were involved in this programme, with 34 multinational (mostly Japanese) companies acting as the anchor companies.

The VDP was established to help market the products produced by the SMIs in Malaysia. Also, with the establishment of this programme,

more SMIs will be involved as vendors to larger, multinational companies which act as the anchor companies to the SMIs, increasing industry linkages. It is hoped that SMIs will be given opportunities to be more competitive as a supplier of electronic and electrical components. Consequently, these companies will be the supporting companies to the industry, leading to a more active involvement in local as well as international business.

Two issues in the programme faced by the Malaysian government are technical ability and transfer of technologies. The SMIs are not ready to develop their own technologies and have to depend on the anchor companies for technical capabilities. The SMIs are, however, encouraged to get co-operation from relevant government agencies to enhance their technical capabilities.

In general, the VDP has been successful in promoting local SMIs as vendors to MNCs in the electrical and electronics products industries in Malaysia. With technical and financial assistance from the MNCs, relevant government agencies, and the banks, the local SMIs should gain their confidence and be better prepared to capture the local and international markets.

RESEARCH OBJECTIVE

The study on the type of material inputs used by these companies and the dependency on local vendors in sourcing material inputs for consumer electronics manufacturers and components manufacturers will help investigate current sourcing practices in the electronics and electrical products industries in Malaysia. This is essential, particularly for the future development of electronics and electrical industry linkages in Malaysia. The findings of the study will present one important aspect of the issue of linkages, namely, the sourcing or procurement practices and the dependency on material inputs by the electronics and electrical products industry in Malaysia. The study also aims to find out which attributes are being used by the electronics and electrical products industries in selecting their suppliers/vendors and also to evaluate their performance in the eye of the buying companies.

Specifically, the research objectives are:

- to determine the sourcing of and dependency on material inputs by the electronics and electrical products industry in Malaysia,
- to evaluate the performance of local and non-local vendors, and

- to find out the major factors used in the selection of local vendors in the electrical and electronics products industries.

METHODOLOGY

Sources of Data

Primary data were used in this study. Data were collected through mail questionnaire and personal interview with the purchasing and/or production manager of companies in the electronics and electrical products industries in Malaysia. The mailing list was obtained from the *Directory of Electronics and Electrical Manufacturers* (MIDA 1993) and also the *Directory of Manufacturers in Malaysia* (Federation of Malaysian Manufactureres 1994).

Questionnaire Design

The questionnaire was designed to indicate the different types of material inputs used by the sample. The respondents indicated the proportion used by using the following scale: 1 = 0%, 2 = 1-20%, 3 = 21-40%, 4 = 41-60%, 5 = 61-80%, 6 = 81-99% and 7 = 100%. The questionnaire also measured the sample's dependency on local vendors in sourcing material inputs. The scale used was the five-point Likert scale from "rely very much" to "do not rely at all". Finally, to find out the importance of attributes and the attributes used to evaluate the performance of local and non-local vendors, the scale used was a five-point Likert scale ranging from "very important" to "not important at all" for importance of attributes and "very good" to "very poor" for indication of performance.

Sampling

The sampling frame was all the electronics and electrical products companies in Malaysia. However, most companies were from Selangor, Penang, Kedah, Perak and Malacca, as most of these companies are situated on the west coast of Peninsular Malaysia. All the samples were randomly selected.

Data Collection

The survey questionnaires were mailed to companies identified earlier in the sampling process. Follow-up letters were sent twice to remind the organization to reply. As the response rate using the mail questionnaire was very poor, data were also collected using structured interviews with the relevant managers.

Data Analysis

Collected data were checked for missing variables, and coded and analysed using the Statistical Package for Social Science (SPSS). The results were analysed and interpreted through descriptive statistics by using frequency counts, percentage, means and standard deviation.

FINDINGS

The characteristics of respondents are shown in Table 1. A majority of the organizations are

TABLE 1
Characteristics of Respondents

Characteristic	Frequency	Percentage
Location		
Kedah	7	13.2
Perak	1	1.9
Penang	10	18.9
Klang Valley	34	64.2
Malacca	1	1.9
Total	53	100.0
Year of Establishment		
1990-1995	20	37.3
1985-1989	14	26.4
1980-1984	2	3.8
1975-1979	3	5.7
Before 1975	8	15.1
Missing cases	6	11.3
Total	53	100.0
Number of Employees		
Fewer than 99	18	34.0
100-199	4	7.5
200-299	4	7.5
300-499	7	13.2
More than 500	16	30.2
Missing cases	4	7.5
Total	53	100.0
Sales 1994 (RM million)		
Less than RM10	15	28.3
RM10-49	17	32.1
RM50-99	7	13.2
RM100-199	3	5.7
More than RM200	3	5.7
Missing cases	8	15.1
Total	53	100.0
Product Types		
Electronics products	21	39.6
Electronics components	10	18.9
Electrical products	8	15.1
Others	13	24.5
Missing cases	1	1.9
Total	53	100.0

located in the Klang Valley and were established about 10 years ago. The structure of the sample indicated that the majority of the organizations had fewer than 99 employees (34%) or more than 500 (30%). More than half the companies had a sales turnover of less than RM49 million; 39.6% produced electronics products, 18.9% produced electronics components and 15.1% produced electrical products.

Table 2 indicates the sourcing pattern for material input in consumer electronics. Generally, packaging, mechanical components and electronics components are the three most popular types of material inputs used by the firms. Almost all packaging material input needed is sourced locally. Approximately 41-60% of the input requirements for mechanical components are sourced locally. However, more electronics components were imported than obtained locally.

Also, it can be seen that besides material inputs, packaging, material inputs for printed material, stamped metal parts, cable harnesses and finishing were also obtained locally. Almost all material inputs for VCR chassis were imported.

Table 3 shows the pattern of sources for material inputs by component manufacturers. Chemicals, packaging, copper wire and cables and metal parts were the most frequently cited material inputs used. For chemicals and copper wire and cables almost equal proportions were obtained locally and imported. On the other hand, almost all packaging material was obtained locally. Relatively more metal parts were obtained locally, such as solderings, PCBs, insulators, plastic bobbins, DC cords, reflector caps and anode assembly. On the other hand, mould compounds, dies, ferrite core, lead frames, gold wire and silicon ingots were imported.

TABLE 2
Sourcing of material inputs by consumer electronics manufacturers

Type of Material Input	Number of Firms	Cost Contribution (Mean)*	Proportion Obtained Locally (Mean)	Proportion Imported (Mean)	Proportion Obtained In-House (Mean)
Packaging	29	2.71	6.00	2.06	1.38
Mechanical components	25	3.60	4.17	3.67	1.15
Electronics components	23	3.83	3.53	4.80	1.40
Printed materials	16	3.00	5.86	2.27	1.33
Mechanisms	15	2.57	2.93	1.93	1.00
Stamped metal parts	14	3.91	5.08	2.27	1.00
Cable harnesses	10	2.38	5.38	6.00	1.00
Other plastic parts	9	3.33	4.14	3.80	2.75
Speakers	6	2.25	3.00	3.18	1.00
Body parts	5	3.33	2.80	3.75	1.00
Finishing	4	4.00	6.25	1.00	3.50
TV chassis	3	N/A	1.00	3.50	2.67
Picture tubes	3	N/A	1.00	3.50	2.67
VCR chassis	2	N/A	1.00	6.00	3.50

Note: The percentages for cost contribution, proportion obtained locally, imported and obtained in-house are categorized into seven categories. The scale used is as follows: 1 = 0% 2 = 1-20% 3 = 21-40% 4 = 41-60% 5 = 61-80% 6 = 81-99% 7 = 100%. The mean scores were calculated from this scale.

N/A = Data not available

TABLE 3
Sourcing of material inputs by components manufacturers

Type of Material Input	Number of Firms	Cost Contribution (Mean)*	Proportion Obtained Locally (Mean)	Proportion Imported (Mean)	Proportion Obtained In-House (Mean)
Chemicals	19	2.71	4.50	4.15	1.00
Packaging	18	2.47	6.25	2.13	1.00
Copper wire and cables	14	2.75	4.92	4.40	1.00
Metal parts	14	3.45	5.78	4.00	2.60
Electronic components	12	3.63	4.44	4.64	2.17
Mould compounds	10	3.22	4.00	6.00	3.75
Precision plastics	9	2.70	4.29	4.50	2.50
Mechanical components	9	3.17	4.14	3.43	2.33
Soldering	9	2.00	6.38	2.00	1.00
PCBs	8	2.00	6.75	3.67	1.00
Dies	8	3.60	4.00	5.80	2.75
Plastic casings	7	3.20	4.50	3.33	1.00
Insulators	7	2.00	5.67	2.80	1.00
Plastic bobbins	6	2.00	5.00	2.75	1.50
Transformers	6	2.50	4.17	3.33	1.00
Ferrite cores	5	3.00	4.75	6.00	1.00
Lead frames	5	3.00	3.00	5.50	1.50
Gold wire	4	2.33	4.00	5.25	1.00
Silicon ingots	3	4.50	2.50	7.00	1.00
EI cores	2	3.00	5.00	3.00	2.50
DC cords	2	2.00	6.00	3.06	1.00
Reflector caps	1	N/A	1.00	3.50	2.67
Anode Assembly	1	N/A	7.00	1.00	1.00

Note ; The percentages for cost contribution, proportion obtained locally, imported and obtained in-house are categorized into seven categories. The scale used is as follows: 1 = 0% 2 = 1-20% 3 = 21-40% 4 = 41-60% 5 = 61-80% 6 = 81-99% 7 = 100%. The mean scores were calculated from this scale.

N/A = Data not available

Table 4 shows that the consumer electronics manufacturers relied on local vendors for supplies for the packaging of the products, followed by the supply of printed materials, mechanical components, other plastic parts, and stamped metal parts. The table also shows that manufacturers in the consumer electronics

industry do not rely on local vendors at all for the supply of picture tubes, TV chassis and VCR chassis.

The dependence on local vendors for the supply of material inputs by the component manufacturers is shown in Table 5. As can be seen from this table, the sources of supply vary.

TABLE 4
Consumer electronics manufacturers' dependency on local vendors in sourcing material input

Type of Material Input	Mean	SD	Rank
1. Packaging	1.70	.91	1
2. Printed materials	2.38	1.47	2
3. Mechanical components	2.69	1.20	3
4. Other plastic parts	2.83	1.53	4
5. Stamped metal parts	2.84	1.61	5
6. Electronics components	3.11	1.25	6
7. Cable harness	3.12	1.58	7
8. Finishing	3.25	1.58	8
9. Mechanisms	3.32	1.46	9
10. Body parts	3.64	1.50	10
11. Speaker	4.46	1.13	11
12. Picture tube	4.86	.38	12
13. TV chassis	5.00	.00	13
14. VCR chassis	5.00	.00	14

Note: 1 = Rely very much SD = Standard deviation
5 = Do not rely at all

TABLE 5
Components manufacturers' dependency on local vendors in sourcing material inputs

Type of Material Input	Mean	SD	Rank
1. Metal parts	2.08	1.31	1
2. Chemicals	2.24	1.09	2
3. Packaging	2.55	1.41	3
4. Plastic casings	2.56	1.24	4
5. Mechanical components	2.70	1.06	5
6. Copper wire and cables	2.76	1.35	6
7. Mould compounds	2.80	1.48	7
8. Electronic components	2.88	1.36	8
9. Plastic bobbins	3.00	1.70	9
10. Dies	3.00	1.58	10
11. Insulators	3.20	1.55	11
12. Ferrite cores	3.22	1.56	12
13. PCBs	3.30	1.57	13
14. Soldering	3.36	1.50	14
15. Transformers	3.38	1.06	15
16. Precision plastics	3.45	1.44	16
17. Gold wire	3.50	1.64	17
18. Lead frames	4.00	1.31	18
19. EI cores	4.00	1.73	19
20. DC cords	4.00	2.00	20
21. Reflector caps	4.00	2.00	21
22. Silicon ingots	4.20	1.30	22
23. Anode assembly	4.50	1.00	23

Note: 1 = Rely very much SD = Standard deviation
5 = Do not rely at all

Local vendors were sought for the supply of metal parts, chemicals, packaging, plastic casings, mechanical components, copper wire and cables, mould compounds, electronic components, plastic bobbins and dies. However, the manufacturers do not rely on local vendors for the supply of inputs for silicon ingots and anode assembly.

An analysis was also conducted to determine the importance of several key performance

attributes of local and non-local vendors and the performance of local and non-local vendors based on several key attributes. As shown in Tables 6 and 7, the manufacturers consider product quality the most important attribute. The manufacturers also consider delivery dates and product reliability. Looking at the performance of local vendors in these attributes, it can be said that the manufacturers

TABLE 6
Differences between expectation and performance of local vendors

Attributes	Importance ¹	Performance ²	Differences ³
1. Delivery dates	1.29	2.31	-1.02
2. Product quality	1.16	2.38	-1.22
3. Product reliability	1.41	2.31	-0.90
4. Price	1.53	2.04	-0.51
5. Financing terms	2.27	2.42	-0.15
6. Experience	1.98	2.56	-0.58
7. Service	1.60	2.11	-0.51
8. Technical knowledge	1.86	2.50	-0.64
9. Maintenance	2.14	2.30	-0.16
10. Reputation	2.16	2.54	-0.38
11. After-sales service	1.96	2.25	-0.29

Notes:

- 1: Importance of attributes in selection of vendors (1 = very important, 5 = not important at all)
- 2: Performance of local vendors (1 = very good, 5 = very poor)
- 3: Differences (positive = satisfaction, negative = dissatisfaction)

TABLE 7
Differences between expectation and performance of non-local vendors

Attributes	Importance ¹	Performance ²	Differences ³
1. Delivery dates	1.29	2.44	-1.15
2. Product quality	1.16	1.75	-0.59
3. Product reliability	1.41	1.85	0.44
4. Price	1.53	2.60	-1.07
5. Financing terms	2.27	2.38	-0.11
6. Experience	1.98	1.77	0.21
7. Service	1.60	2.41	-0.81
8. Technical knowledge	1.86	1.73	0.13
9. Maintenance	2.14	2.22	-0.08
10. Reputation	2.16	2.02	0.14
11. After-sales service	1.96	2.54	-0.58

Notes:

- 1: Importance of attributes in selection of vendors (1 = very important, 5 = not important at all)
- 2: Performance of non-local vendors (1 = very good, 5 = very poor)
- 3: Differences (positive = satisfaction, negative = dissatisfaction)

TABLE 8
Factors motivating organizations to use local vendors

Factors Considered	Mean	SD	Rank
1. Costs	1.34	.52	1
2. Product delivery	1.38	.60	2
3. Product quality	1.51	.74	3
4. Inventory	1.91	.89	4
5. Foreign exchange	1.91	1.03	5
6. Company policy	2.09	1.01	6
7. Distance	2.15	.99	7
8. Requirements	2.18	.95	8

Note: 1 = very important SD = standard deviation
5 = not important at all

are, in general, not satisfied with their performance on product quality, delivery dates, and product reliability. However, the manufacturers are quite satisfied/happy with the local vendors' financing terms, maintenance, and after-sales service. As for the non-local vendors, the manufacturers are quite satisfied with the vendors' technical knowledge, reputation, experience and product reliability. Overall, the manufacturers seem to be more satisfied with the non-local vendors.

Table 8 indicates that cost is the most important factor that motivates manufacturers in the electrical and electronics products industries to use local vendors. Almost equally important is the delivery and quality of products.

CONCLUSION AND IMPLICATIONS

Fig. 2 shows the summary of findings from this study. There are several conclusions that can be derived from the findings. First, manufacturers in the electronics and electrical products

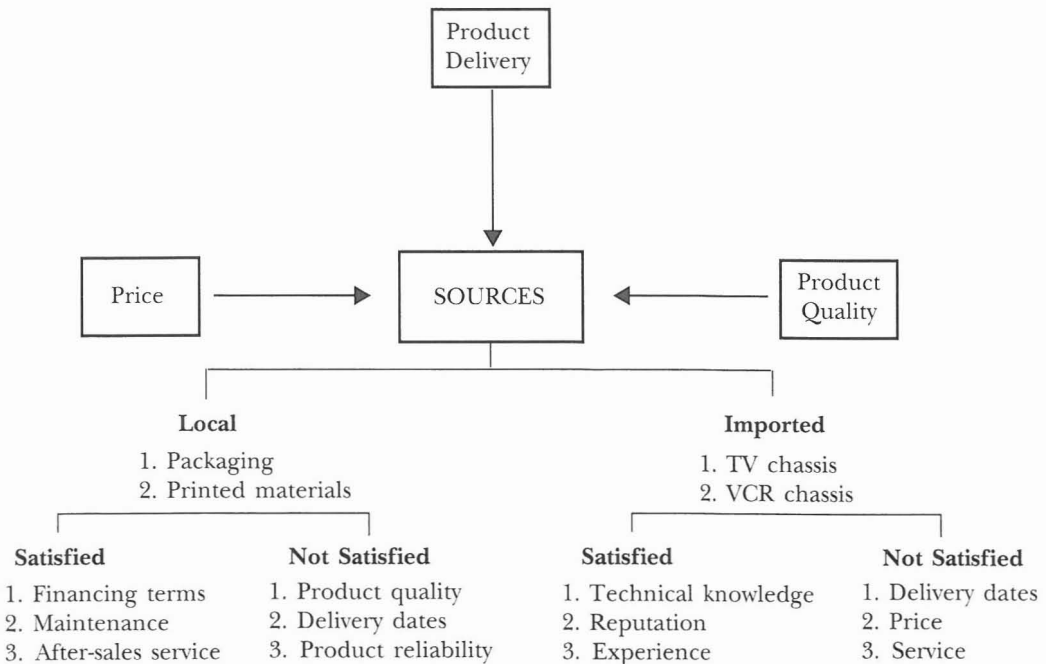


Fig 2. Sourcing of inputs and factors considered in the selection of vendors in the electrical and electronics industry

industry rely on different vendors for different and specific types of inputs. The study found that manufacturers rely on local vendors for material inputs for packaging, printed material, metal parts and chemicals, but not technical inputs such as TV and VCR chassis. The manufacturers rely on non-local vendors for the supply of materials such as silicon ingots.

The second conclusion is that the manufacturers are more satisfied with the non-local vendors than local vendors. For the local vendors, the manufacturers are satisfied with the financing terms, maintenance and after-sales service, but not product quality, delivery dates and product reliability. As for the non-local vendors, the manufacturers are satisfied with their technical knowledge, reputation and experience and are not satisfied with their delivery dates, price and service.

The third conclusion is that product price, delivery and quality are perceived to be the major factors motivating the manufacturers to use local vendors.

From the findings of this study, it may be concluded that Malaysian vendors have not met the manufacturers' expectation standards, especially in terms of the factors they consider important. Consequently, the manufacturers are forced to rely on the non-local vendors who are perceived to be better, even though they are not satisfied with the non-local vendors' delivery dates and price quotes.

One major implication of these findings is that if the local vendors (SMIs) aspire to enjoy the competitive edge, they need to strive to improve their performance. To ensure success in the long run, the local vendors must be able to compete with the better-performing non-local vendors. Therefore, the local vendors should improve their performance in terms of product quality and delivery dates in order to reach the expectation of the manufacturers. To improve the quality of their products, it is suggested that the local vendors emphasize the research and development of the products and be actively involved in vendor development programme in order to gain technology transfer from abroad or financing support from the government.

One of the major attributes considered unsatisfactory for the non-local vendors is the

delivery dates because shipment from abroad takes time due to the long distance. Hence, the local vendors should try their best to supply the products as soon as possible as they already have the advantage of distance. In addition, the product reliability of the local vendors also should be further improved. In order to do that, again they must enhance the product quality and always keep in touch with the manufacturers, give advice and help to the manufacturers when necessary. If they consistently maintain their good service, their reputation would surely improve in the long run.

As for future policy formulation, it is implied from the findings of the study that for local vendors to stay competitive in the future there should be more research and development programmes geared towards enhancing the production of good quality products by the local vendors. There should also be extensive technical training programmes to ensure that the local vendors are aware of new ways and methods to produce good quality and reliable products. The local vendors should be exposed to new technology from the more developed nations that can be adapted for use in the electronics and electrical products industry in Malaysia.

Another major implication of the findings is that the local vendors should be globally oriented, i.e. they should not only think of the domestic market in their dealings. The vendors should start promoting their products outside the country in order to be more competitive in outlook. The government can help encourage this by inviting the local vendors to participate in trade missions and visits overseas. Locally, more trade shows should be conducted to expose and educate the domestic customers of the products and services rendered by local vendors in this industry.

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