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An Externalization Process among Penang Electronics Industry: Issues and Way Forward

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Abstract: In the context of electronics industry, the roles of R&D and IT component in the manufacturing process are important concerns that may influence Just-In-Time delivery (JIT) services. However, the crucial issue to be addressed in discussing the rapid development in electronics industry sector is pertinent to the main factor which triggered the subsidiary firms to gain R&D and IT component services from outside and not self-developed by the firms in location. By means of unstructured questionnaire and interview, a total of 30 electronics firms in Penang industrial areas were selected as respondents, were interviewed and studied. The findings indicate that there are factors which was neither with a cost nor with quasi-dominant cost as the trigger for externalization process among Penang electronics industry compared to the cost factors. As a way forward with a view to boost the role of local R&D and IT services provider firms, this study suggests an approach that can be adopted to enhance a positive image and experience of R&D and IT to cater to the electronic manufacturing sector demand in Penang.

Key words: Externalization, electronic firms, penang industrial areas, R&D, IT services

INTRODUCTION

In any manufacturing industry sector, one of the complicated problems which are commonly faced by the process planners is when making decisions either to self-develop the needed services component internally or to acquire it from foreign suppliers (Beyers and Lindahl, 1996; Abidin, 1999; Ramesh and Tiwana, 1999; McIvor, 2000). Mclvor, (2000) have identified cost relevant issue, types of activity carried out, relationship with the suppliers and besides the technology roles as some of the factors that the process planners have considered in the decision making process before they acquired the R&D and IT services from the Foreign firms. In short, the obvious issue in the externalization process normally relates to: the factor which affects the externalization process; the extent of integration which is in line with the business strategy that they carry out; the people involved in the decision making process; the cost analysis; and the pertinent services provider's roles (Beyers and Lindahl, 1996; Ramesh and Tiwana, 1999; McIvor, 2000). This study aims to explicate the factors that affect the externalization process among firms of electronic industry in Penang.

MATERIALS AND METHODS

The research was conducted in selected industrial areas in Penang. Penang, the second smallest state in Malaysia is situated in the mainland in the South West of Peninsular Malaysia. Penang Industrial. Areas can be divided into industrial estates, technoplex area and Free Industrial Zone (FIZ). More specifically, it is represented by FIZ and technoplex areas in Bayan Lepas as well as Mak Mandin, Prai, Seberang Jaya, Bukit Minyak and Bukit Tengah industrial areas. To date, the earliest built electronic giant firms in Penang are still running their manufacturing operation. These firms have dominated the high-technology with some added values of manufacturing products. Apart from that, there are also new areas that have been developed which is abreast with the current change and development and also meeting the requirements of the high tech firms in which the area is crucially considered as one of the corporate strategies. In short, it can be stated that Penang has a unique strength as a manufacturing operation centre compared to just as the product assembling activity. However, the number of the firms that fulfil the stated features are limited.

Industrial areas in Penang are outstanding in utilizing the R&D and IT service components which eventually will be able to support the electronic industrial production activity. This research utilizes the premier data from survey forms and interviews in the study areas which had been carried out by the researcher. In order to succeed in this particular research, the researcher had requested to interview the firm's chief executive officer, especially those who are directly involved in decision-making process pertaining to manufacturing planning and

executing process. These include the manufacturing department director, R&D department manager engineer, human resource department manager and other relevant officer. This is done to acquire detailed information from those individuals who work directly and to have deeper understanding of the factors in the decision-making process among the firms.

RESULTS AND DISCUSSION

Table 1 shows the reasons for the firms to not supply their own R&D and IT component which is internally needed followed by the ranking. Each factor is depicted in location form in order to distinguish the most dominant factor and the less essential factor based on the studied firm's perception. Hence, it is found that the non-cost nature factor and quasi-cost are more dominant to trigger the externalization process compared to the cost factor. Basically, the need to respond to the global rapid change in demand and market trends or the flexibility in the midst of any crisis forced the firms to acquire the latest and specific R&D and IT component from foreign countries. This scenario happened as the electronic products have always required the latest and sophisticated technology in order to cater to the demands and to abide by the production schedule.

Internal technology development is one of the high risk efforts which influence the new product to become outdated very quickly. Therefore, a profit from the new technology development is no longer beneficial for longer period of time. This is due to the electronic products which normally experience significant fluctuating demands. This is specifically true when any international level crisis happens which at the end abruptly forces the manufacturing service firms services to cancel the Foreign service component. Any changes and crisis will affect the production and eventually jeopardize the firm's performances. The need to address the current changes shows that there is another power beyond their controls and frequently justified in order to ensure that the product manufactured is able to fulfil the customer's needs (Ramesh and Tiwana, 1999; Fauziah, 2005). Hence, any changes and decision made by the branch firms or headquarters should aim to have better production control, especially to ensure that the product is in the market on time.

From the firm's perspective, the foreign R&D and IT component will speed up the product development or multiple level of production process. Indirectly, these situations provide a unique factor and distinguish the product from others. Apart from that, wise integration usage enables the firm to be responsive enough towards the rapid changes in industry manufacture. It has been found that the innovation rate experienced by the firm in acquiring or dealing in sub contract, specifically for specific skills from the foreign firms is higher and more encouraging compared to those firms which have not done as such.

Generally, the types of service components from foreign countries hardly include critical components which are difficult to develop locally due to the lack of technology infrastructures. Moreover, there are well-established firms with TNCs and MNCs level which have also conducted the externalization activity despite having sophisticated infrastructures in their firms. This occurs as sometimes it is more economical if half of the

Table 1: An externalization process among electronics firms in Penang industrial areas: factors influenced by rating

	*Rating (%)				
Factors	1	2	3	4	5
Non-cost factor					
Lack of technical skills	30	16.7	10	3.3	3.3
Small size to self-supply services	3.3	-	3.3	10	-
Government policy increment	-	3.3	-	-	3.3
The need for non-profit specialist's opinion	6.7	36.7	-	6.7	6.7
The need to respond to the technology rapid changes	10	6.7	23.3	20	6.7
The need for current economy changes	3.3	3.3	16.7	3.3	10
Increment in more complicated firm's management	10	6.7	10	10	16.7
Changes in customer's business foundation	-	3.3	3.3	6.7	13.3
Internationally more complicated business context increment	-	3.3	-	-	-
Cost factor					
Assumption in getting cheaper foreign services	3.3	-	6.7	13.3	3.3
Lack of financial resources in producing own services that they needs	3.3	-	10	3.3	6.7
Unpredictable changes in customer's demand	6.7	-	3.3	6.7	6.7
Instruction from the headquarters firm	6.7	-	-	-	-
Quasi cost factor					
To reduce the risk if they themselves produce services within the firm	3.3	6.7	3.3	3.3	10
The services are not frequently needed	13.3	10	3.3	3.3	10
The service provided is not suitable with the main function/objective	-	3.3	6.7	10	3.3

*This table took five ratings into account out of ten

needed process or service component from the Foreign suppliers have better abilities and are more skilful (Coe, 2000).

Even though the internally-developed skill is the main key towards product development efforts by most of the manufacturing firms, the technical support from Foreign countries has also been perceived quite important recently. The premier issue in discussing the externalization processes is the decision is always closely pertinent to the cost reduction and specific asset importance. As a result, the firms need to acquire the needed services component from Foreign countries in order to get the cheapest price. Next, the externalization process is closely related to the main efficiency which is the core to the firm manufacturing process.

Normally, this is due to the firm merely giving more attention to the main skill so that it is parallel with the function or main business objectives. Attention or focus towards multi-functions will affect the co-ordination and the firm's control over a product which generally needs optimum observation. This circumstance enables us to portray the management ability to control manufacturing skills; especially in ensuring the manpower in controlling manufacturing technology as a response to the rapid changes in the new business opportunities ability (Perry, 1992).

The foundation for externalization process in the studied areas depends on the corporate strategy and TNCs policy, the extent of the needed specialty and information provided by the supplier firms as well as the type of product manufactured. However, it should be realized that the externalization process experiences is an approach change which suits the time changes. Therefore, it needs the firm to respond in a more proactive and established method. A study by Clarke (1994) pertaining to the relation between manufacturing firm and Foreign service provider shows that some firms acquired services from the global-chain as a response to the market or as an effort to acquire new production opportunities. Apart from that, some of the firms agreed with this opinion especially the multi-national level firms. The acquisition of R&D service component from the global-chain indirectly would "sell" the reputation and the firm's ability among the customers all around the world who, on one fine day probably would have the interest to co-operate in the product manufacturing process. This is due to the internationalisation of the operation or firm manufacturing product which would acquire more and more different customers in order to ensure prolonged competitiveness, thus continuing to be eminent among customers as well as their competitors (Dicken, 1998). Also, those firms which had acquired the Foreign service component are able to re-structure the value-chain and to pay more attention to several main activities. This enables them to achieve and control excessive competitions in order to get the world class status; specifically for the advanced technology-based firms (Ramesh and Tiwana, 1999; Lehtinen, 1999). In addition, the electronic industry development policy in Malaysia, including those operating in Penang, need the firms to export the whole production to Foreign markets. The implication of this phenomenon has caused a high dependency on Foreign markets and indirectly will open the national economy to ups and downs of the world economy patterns.

Most of the firms which had acquired the R&D and IT service component from the local service suppliers had problems while dealing with those concerned. One of the excuses given by the firms was that not even one of the local services provider firms were qualified enough to offer services with the required specification. Local service suppliers have been lamented as not having needed skills and lacking in experience in terms of managing and offering services. Apart from that, they are still far behind in term of preparing sophisticated technology infrastructures. This is because the required need must be with a specific nature and far much better from what the local firms able to offer. Furthermore, the choices are limited since there are not many local service providers operating. It has been found that there are no service provider firms that specialize in service component bargain operating in the research areas. It differs from the empirical study evidence which had been carried out in other countries which have shown industry location operating near to service network resource. This caused the industry firms to get the needed service resources from foreign service providers, such as from Finland for telecommunication-based technology and the United State for computer-based technology. Even though the price offered is much higher, these firms that really need the service component are willing to pay because the skills and input obtained are sufficient. This shows that there is no give-and-take in determining which firms are qualified enough to supply the needed service component.

Issues and way forward: Even though the firms face challenges while dealing with the services provider, the firms are not planning to develop their own service component that they need locally. This is because the latest intervening services component transitions are tremendously fast and difficult to assume. Those firms which intend to develop their own needed service

components in the future normally are the giant firms with the hope to produce more powerful manufacturing services and they are always ahead of their competitors. R&D and IT component demands by the surveyed firms which tend to get the services from Foreign service providers show a continuous rate for high-tech imported component. This indicates that the established synergy is not yet attached between the provided infrastructure facilities and the effort to gain a wider and more matured service in Malaysia.

Apart from that, another excuse given by the surveyed firms is related to the local services provider firm's capability which is less skilful and lacking in 'on-the-dot' delivery while providing the needed services component. In fact, this matter is related to the infrastructure, knowledge and skills among the affected workers which are not encouraging, to the extent of delimiting the firm's confidence to acquire their services.

In this context, basic features such as industry support, skill-laboured for pre-production, infrastructure, knowledge and skill as well as capital in the firms are still under developed. Hence, it can be concluded that the Malaysian manufacturing industry foundation, including those in Penang, is still immature in receiving backward production level and some of the processes are more suitable to be located in the firm's headquarters. In reality, foreign multinational firms are still depending on their central head office in order to obtain certain expertise particularly related to the latest technology. The step is taken to ensure that the development and product designing process are able to react swiftly to any change in the global scale. In this respect, electronic industrial areas like the Penang industrial areas have re-positioned themselves within the global system of regions by restructuring their industrial growth to achieve higher levels of manufacturing.

The lack of basic features such as support service and skill-laboured (engineers and trained-technicians) that are crucially needed before the production process is considered as critical. Most of the IT activities tend to be focused on collecting, processing and storing data instead of generating, developing and disseminating information even though at the other extreme, the country has sophisticated facilities through the Multimedia Super Corridor project. This shows that the established synergy is not intertwined yet between the infrastructure facilities which have been provided with the effort to enhance the industry development in a wider and more matured manner.

Therefore, a re-assessment towards achieving this strategy should be done in order to ensure the nation's manufacturing industrial sector is on the right trajectory. This is due to the rapid changes in the electronic industry which has forced the firms to respond abruptly. The only secure shortcut is by obtaining the research service component from the headquarters R&D unit or at least from Foreign service provider firms which are operating overseas. After all, this happened since the Foreign services provider firms especially from the United State, Finland, United Kingdom and other countries have the specific expertise and they response faster to the demand change trends which frequently change within a short period of time. On the other hand, the local firms are normally still at the adapting level with the available technology and the skills are considered as still low.

The strategy to increase the electronic product chains by integrating the local R&D component to be more responsive to the current economy changes is still beyond the real target. Even though some of the efforts to unpack the integration have been seen, conversely, the implementation is not comprehensive to enable the services provider local firms to gain the advantages by developing congruently. It is due to the main focus for manufacturing firms in the areas of study on semi-conductor chip production and not sufficient to show the pre-production merger such as wafer fabrication level, wafer production and even full R&D activity. The Penang industrial areas, especially the Free Industrial Zones (FIZ) in Bayan Lepas as well as the technoplex area which is situated in metropolitan area and near the Bayan Lepas International Airport, are given the privilege to develop rapidly. Indirectly, the opening of the free industrial zones indicates the starting point of Penang's economic exposure to the fluctuating patterns of global economy.

CONCLUSION

This study elaborates on the externalization scenario which happened in the electronic industry sector manufacturing process in Penang, showing the decision related to the dynamic and complicated manufacturing process. Every factor which affects the externalization process is related to each other and every decision made by the firms has the dynamic nature due to other related considerations that need to be considered. It can be concluded that the decision on the source of R&D and IT services should be acquired based on the types of product manufactured. This is due to the fact that if it is from the high value product, the firms have the tendency to get the service component either from their main

headquarters or at least from Foreign producer service firms. The findings that have been considered in this study have not been much different from those of the Foreign countries.

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