

JYVÄSKYLÄN YLIOPISTO

Taloustieteiden tiedekunta

**INTERNATIONALIZATION OF A FIRM;
A CASE OF MALAYSIAN WATER INDUSTRY**

Yrittäjyys, Pro gradu - tutkielma

Kesäkuu 2002

Laatija: Tomi Tuovinen

Ohjaaja: Professori

Hannu Niittykangas

JYVÄSKYLÄN YLIOPISTO TALOUSTIETEIDEN TIEDEKUNTA

Tekijä Tomi Mikael Tuovinen	
Työn nimi Internationalization of a firm; a case of Malaysian water industry	
Oppiaine Yrittäjyys	Työn laji Pro gradu-tutkielma
Aika Kesäkuu 2002	Sivumäärä 90 + liitteet
<p>Tiivistelmä - Abstract</p> <p>The internationalization of a firm is an important and challenging task for companies. Because the company wants to increase profit or market share, they are expanding abroad. Other major motivations can be tax benefits or competitive pressure. Internationalization, however, is assumed to play a more important role as a growth alternative in the firms, and it offers prospects, which could not be gained through domestic operations.</p> <p>The purpose of this study is to explore the market entry to the Malaysian markets by an SME firm. The theoretical aim of this thesis is to outline and analyze the various operation methods from which companies may choose to conduct business abroad. The empirical purpose is to find out information about the Malaysian water industry in general and how a company can make use of this information for marketing and development purposes.</p> <p>The empirical part was conducted by using qualitative approach, where the information is collected practically by interviewing the people working in the water industry. The goal is to get deeper and more overall understanding about the topic studied than in quantitative approach, where you have plenty of different material to go through to get an overall idea. The idea of using qualitative method is to get closer relation between the material and the topic surveyed.</p>	
<p>Asiasanat</p> <p>Internationalization, market entry, Malaysian water industry, narrative</p>	
Säilytyspaikka	Jyväskylän yliopisto / Taloustieteiden tiedekunta

1. INTRODUCTION	2
1.1 BACKGROUND	2
1.2 PURPOSE.....	3
1.3 STRUCTURE OF THE THESIS	4
2. INTERNATIONAL BUSINESS.....	6
2.1 WHAT IS INTERNATIONAL BUSINESS?	6
2.2 THE OUTWARD EXPORT AND IMPORT OPERATIONS.....	8
2.3 MOTIVATIONS TO GO ABROAD	18
2.3.1 <i>Proactive motivations</i>	18
2.3.2 <i>Reactive motivations</i>	19
2.3.3 <i>Strategic effects of going international</i>	20
2.3.4 <i>Restrictions and promotions of import and export</i>	21
2.4 INTEGRATION	26
2.5 INTERNATIONALIZATION AS A PROCESS	31
2.5.1 <i>Concept of Internationalization</i>	31
2.5.2 <i>Dimensions of Internationalization</i>	32
2.5.3 <i>Patterns of Internationalization</i>	33
3. MALAYSIAN WATER INDUSTRY	35
3.1 ACHIEVEMENTS AND OUTLOOK.....	35
3.2 QUALITY OF WATER AND PIPES.....	36
3.3 POLITICAL PLANNING	37
3.4 RURAL WATER SUPPLY	38
3.5 LEGISLATIONS RELATED TO WATER.....	39
3.6 STRUCTURE OF WATER NETWORK DISTRIBUTION SYSTEM	42
3.7 LOCAL INSTANCES.....	43
3.7.1 <i>Structure of Water treatment plant operation</i>	43
3.7.2 <i>Non-Government Bodies Related to Water Supply</i>	44
3.8 WATER RESOURCES	46
3.8.1 <i>Water Resources and Supply</i>	46
3.8.2 <i>Present Water Use</i>	47
3.8.3 <i>Water Demand</i>	48
3.8.4 <i>Water Resources Planning and Development</i>	48
4 CORPORATE INTRODUCTION AND XPIPE IN MALAYSIA.....	49
4.1 INTRODUCTION	49
4.1.1 <i>Building and Construction</i>	50
4.1.2 <i>Energy distribution</i>	51
4.1.3 <i>Public Infra</i>	52
4.1.4 <i>Projects</i>	53
4.2 TEKLA XPIPE – WHAT IS IT?.....	54
4.2 SURVEY STUDY FOR TEKLA XPIPE IN MALAYSIA	61
4.3 DEVELOPMENT	66
4.4 RECOMMENDATIONS FOR XPIPE MARKET ENTRY	77
5. CONCLUSION	81
REFERENCES	84
APPENDICES.....	90

1. Introduction

1.1 Background

International business operations are important for companies in Finland. Since the country's own markets are relatively small, the companies have to seek growth potential often abroad. The reason for writing about international business and a company's internationalization is that the thesis tries to find out different methods for companies to establish its foreign operation.

In this thesis the writer had two possible approaches to follow when researching Malaysian water industry. These were qualitative and quantitative approaches. Quantitative approach would have included studying the survey and analyzing its results. In qualitative approach, which is used here, the information is collected more practically by interviewing the people working in the industry. The idea of using qualitative method is to get closer relation between the material and the topic the writer is surveying. The qualitative method used is so called constructive survey, which is typically based on case studies and therefore material is narrow. The constructive survey is a normative survey and it gives recommendations for a certain topic.

The writer lived four months in Malaysia, Kuala Lumpur, to study Malaysian water industry and collect information related to this field. Malaysia is rapidly moving towards industrialization and therefore they need to further strengthen and streamline the water industry to serve the needs of both industrial and individual users. Several measures have been taken under political planning. Malaysia has emphasis on improving the efficiency as well as the water quality of the existing water supply systems through the rehabilitation and upgrading of treatment plants and distribution systems.

The research was done in Finland and Malaysia. The writer worked in a Finnish company, which has offices in both countries. The company is trying to have market entry to Malaysian water markets with one of its products. The people in the

company gave valuable information to the writer and helped him to organize meetings with local instances. The thesis gives also some proposals for the company to succeed in Malaysian water markets.

1.2 Purpose

The theoretical aim of this thesis is to outline and analyze the various operation methods from which companies may choose to conduct business abroad. The purpose is to help companies to find right alternatives to internationalize their business operations by introducing different operation methods. In section two different operation methods are described for companies planning to expand abroad and what motivates them to do so.

To date actual patterns of usage have been relatively consistent for manufacturers: in the main, operations begin via exporting, with perhaps a later shift to some form of foreign investment. For service companies it tends to be more difficult to offer the service without a direct on-the-spot presence, so that an earlier move to the investment mode is more likely. When decisions about foreign operations are made, it is uncommon for the full range of operation forms to be considered.

Such an attitude appears to prevail at a time when the international business environment is experiencing considerable change, creating both opportunities and pressures for more diverse forms of operation. It is increasingly difficult for companies to follow only one preferred mode of operation in foreign markets through time. Not only are external environmental factors likely to induce changes, but the internal capacity of a company to perform in different ways.

The empirical purpose of this thesis is to find out information about the Malaysian water industry in general and how a company can make use of this information for marketing and development purposes. The marketing strategy for a product is introduced, as are recommendations for market entry in Malaysia and a brief introduction about the businesses in which the company is involved.

The survey of the Malaysian water market situation was conducted in various models such as visiting the different water bodies, collecting the information from the available sources, interviewing the consultants from water industry as well as internal discussions with Tekla people involved in Xpipe.

1.3 Structure of the thesis

The thesis deals with the wide variety of operation forms used in international business operations. The International Business-section gives an overall impression what is international business all about from the company's point of view, which is planning to go international. The section has five sub-categories. In sub-categories the meaning of international business is explained. Also the outward export and import operations are explained and how company can use the different operation forms to go international.

The third sub-category deals with the issues like what motivations lead company to go abroad and also what kinds of restrictions there are related to international business. In fourth sub-category it is told how countries try to protect their domestic market in different ways and it is important for the company that they know what needs to be done that restriction will not harm their business operations.

In this category also the economic integration is discussed in general to give an idea how countries globally have integrated and built blocs. Because of the growing importance of the integration it is necessary to explain how and why different regional groupings based on economics are created. Understanding of integration helps company to create marketing strategy and to think whether establish own subsidiaries to the countries that belongs to the certain integration bloc.

Final sub-category discusses with the internationalization as a process and the concept "internationalization" is explained. Dimensions related to internationalization; organizational method, personnel capabilities and organizational structure as well as patterns in target country and company level are also explained.

Third main section deals with the topics related to Malaysian water industry. The general overview about the market situation is introduced with some legislation issues and how the distribution system is networked. The local instances and their purpose in the field are mentioned as well as the water usage and demand in the country.

It will be noticed that there is not a simple connection of the eight sub-categories. The idea is to give general information about the Malaysian water industry. In contrast, the purpose of the thesis is to give an idea how the company can go international, while use Tekla as an example company who is trying to entry for Malaysian challenging water market.

Fourth main section introduces Tekla and its company products. Tekla Corporation is the leading supplier of model-based software in the world and it has categorized its main operations to four different business areas: public infra, building & construction, energy distribution and projects. The company has operations in more than 50 countries worldwide and they are heavily investing to Asia at a moment.

The section four also explains how the survey has been done and which approaches have been used. Based on the approaches used, the development section explains about the product differentiation, competition, customer service and security. The recommendations for Xpipe market entry in the final sub section, stresses the actions Tekla should do in order to get their product into the Malaysian market and how Tekla should precede with different instances for example government bodies and authorities.

The final main section, conclusion, summarize the overall thesis and concepts that have been discussed in the thesis. From the Appendices, the reader can find the charts referred from text. By looking the charts reader gets more detailed statistical information about the dams, lengths of the pipes, water staff employed and water consumption in Malaysia.

2. International business

2.1 What is international business?

According to Czinkota, Ronkainen & Moffet (1999, 4) international business consists of transactions that are devised and carried out across national borders to satisfy the objectives of individuals and organizations. These transactions take various forms, which are often interrelated. Primary types of international business are export-import trade and direct foreign investment. The latter is carried out in varied forms, including wholly owned subsidiaries and joint ventures. Additional types of international business are licensing, franchising and management contracts.

The definition indicates that satisfaction is a key tenet of international business. The fact that the transactions are across national borders highlights the difference between domestic and international business. The international executive is subject to a new set of macro environmental factors, to different constraints, and to quite frequent conflicts resulting from different laws, cultures and societies. The basic principles of business still apply, but their application, complexity and intensity may vary substantially. (Jones 1996)

The definition also focuses on international transactions. The use of this term recognizes that doing business internationally is an activity. Subject to constant change, international business is as much an art as a science. Yet success in the art of business depends on a firm grounding in its scientific aspects. Individual consumers, policymakers and business executives with an understanding of both aspects will be able to incorporate international business considerations into their thinking and planning. (Fram & Ajami 1994, 17-23)

Ever since the first national borders were formed, nations and individuals have conducted international business. In many instances, international business itself has been a major force in shaping borders and changing world history. (Krugman 1993, 23-26)

Krugman (1993, 23-26) claims that international business had forged a network of global linkages around the world that binds us all much closer than ever before. These linkages tie together trade, financial markets, technology and living standards in an unprecedented way. They were widely recognized during the worldwide oil shock of the 1970's and have been apparent since then. A freeze in Brazil and its effect on coffee production are felt around the world. The sudden decline in the Mexican peso affected financial markets in the United States and reverberated throughout Poland, Hungary and the Czech Republic. The economic turmoil in Asia affected stock markets, investments and trade flows in all corners of the earth.

According to Czinkota et. al. (1999, 8) these linkages have also become more intense on an individual level. Communication has built new international bridges, be it through music or the watching of international news programs. New products have attained international appeal and encouraged similar activities around the world. People wear blue jeans, dance the same dances and eat hamburgers and pizzas.

International business has also brought a global reorientation in production strategies. Earlier it was thought impossible to produce car parts for a car in more than one country, assemble it in another and sell it in yet other countries around the world. However, such global strategies, coupled with production and distribution sharing, are common today. Firms are also linked to each other through global supply agreements and joint undertakings in research and development. (Porter 1990)

The level of international investment is at an unprecedented high. Multinational corporations conducting such investments have become corporate giants, which in terms of sales, can be bigger than entire nations. Ford's sales are greater than Saudi Arabia's and Norway's economies. Philip Morris's annual sales exceed New Zealand's gross domestic product. Global investment strategies have had major effects on the patterns of trade. For example, many export and import flows are the result of multinational corporations shipping products to or from their subsidiaries. Such global investment also forces companies to recognize and play by new rules in areas such as business practices, legal requirements and ethics. (Naisbitt 1994)

2.2 The outward export and import operations

The following sub-categories will explain different ways for company to internationalize their operations. For manufacturers exporting is still the most common way of doing business abroad, especially in the early stages of internationalization. This is why export operations are best known and mastered in most companies.

The sub-categories contain partial similarities and might be seen to differ very little or not at all. However, the writer saw it necessary to bring out different methods and customs in order to give the reader as wide a picture of different internationalization methods as possible.

2.2.1 Indirect exporting and importing

Firms can be involved in exporting and importing in an indirect and direct way. Indirect involvement means that the firm participates in international business through an intermediary and does not deal with foreign customers or firms. Direct involvement means that the firm works with foreign customers or markets with opportunity to develop a relationship. The end result of exporting and importing is similar whether the activities are direct or indirect. In both cases, goods and services either go abroad or come to the domestic market from abroad and goods may have to be adapted to suit the targeted market. (Luostarinen 1970, 28-32)

Many firms are indirect exporters and importers, sometimes even without their knowledge. For example, merchandise can be sold to a domestic firm that in turn sells it abroad. This is most frequently the case when smaller suppliers deliver products to large multinational corporations, which use them as input to their foreign sales. Foreign buyers may also purchase products locally and then send them immediately to their home country. While indirect exports may be the result of unwitting participation, some firms also choose this method of international entry as a strategic alternative that conserves effort and resources while still taking advantage of foreign opportunities. (Luostarinen 1990, 20-24)

Many firms that perceive themselves as buying domestically may in reality buy imported products. They may have long-standing relations with a domestic supplier who, because of cost and competitive pressures, has begun to source products from abroad rather than to produce them domestically. In this case, the buyer firm has become an indirect importer. (Luostarinen 1990, 20-24)

2.2.2 Direct exporting and importing

Firms that opt to export or import directly have more opportunities ahead of them. They learn more quickly the competitive advantages of their products and can therefore expand more rapidly. They also have the ability to control their international activities better and can forge relationships with their trading partners, which can lead to further international growth. (Håkanson 1979)

The firms also are faced with obstacles. These hurdles include identifying and targeting foreign suppliers and customers and finding retail space, processes that can be very costly and time-consuming. Some firms are overcoming such barriers through the use of mail-order catalogs or video brochures (Luostarinen 1990, 25-29). In Japan, for example, "high-cost rents, crowded shelves and an intricate distribution system have made launching new products via conventional methods an increasingly difficult and expensive proposition. Direct marketing via catalog short-circuits the distribution train and eliminates the need for high-priced shop space." (New 'Storeless' Market Gateways 1989, 3)

2.2.3 Own export operations

Own exporting applies when there is no domestic or foreign middleman between the producer and final customer. If the firm has its own sales unit abroad there is no foreign middleman, but this case is not included in own exporting because of the direct investment made and this is regarded as belonging to subsidiary operations. (Toyne 1989, 35-41)

Because of the lack of intermediaries, own exporting demands continuous traveling and contact with the markets and final customers. Even if it is the most expensive mode it can be a most efficient way of exporting. (Toyne 1989, 35-41)

Own exporting is fully performed by the manufacturer. This is why it is a very demanding way of exporting. In order to be able to utilize the advantages and avoid its disadvantages the firm should be able to do all that is demanded by direct exporting, deal directly with the final customer without getting any help from local distributors and be as efficient and knowledgeable about the final customer as local competitors and more so than local distributors. (Luostarinen 1990, 27-28)

The advantages of own exporting are rapid contact with the final customer; easier development of a long-standing relationship, selling and marketing can be built on this relationship and greater control of the development of the foreign business. On the other hand problems occur, when for example a buffer stock is demanded by the buyer to guarantee reliability, continuity and rapidity of supplies or own exporting is not enough. (Luostarinen 1990, 27-28)

2.2.4 Licensing operations

Under a licensing agreement, one firm permits another to use its intellectual property for compensation designated as royalty. The recipient firm is the licensee. The property licensed might include patents, trademarks, copyrights, technology, technical know-how or specific business skills. For example, a firm that has developed a bag-in-the-box packaging process for milk can permit other firms abroad to use the same process. (Luostarinen 1990, 31-66)

Assessment licensing as an entry strategy, requires neither capital investment nor detailed involvement with foreign customers. By generating royalty income, licensing provides an opportunity to exploit research and development already conducted. After initial costs, the licensor can reap benefits until the end of the license contract period. Licensing also reduces the risk of expropriation because the licensee is a local company that can provide leverage against government action. (Welch 1983)

Licensing may help to avoid host-country regulations applicable to equity ventures. Licensing also may provide a means by which foreign markets can be tested without major involvement of capital or management time (Oravainen 1979, 14-20). Similarly, licensing can be used as strategy to preempt a market before the entry of competition, especially if the licensor's resources permit full-scale involvement only in selected markets. (Luostarinen 1990, 31-66)

Disadvantages in licensing are that it is very limited form of foreign market participation and does not in any way guarantee a basis for future expansion. In exchange for the royalty, the licensor may create its own competitor not only in the market for which the agreement was made but for third-country markets as well. (Luostarinen 1990, 31-66)

2.2.5 Franchising operations

A fourth international entry strategy, franchising, is the granting of the right by a parent company (the franchisor) to another, independent entity (the franchisee) to do business in a prescribed manner. The right can take the form of selling the franchisor's products; using its name, production and marketing techniques; or using its general business approach. (Hackett 1979, 61-81) Usually franchising involves a combination of many of those elements. The major forms of franchising are manufacturer-retailer systems (car dealership), manufacturer-wholesaler systems (soft drink companies) and service firm-retailer systems (fast-food outlets). (Aydin et. al., 43-53)

To be successful in international franchising, the firm must be able to offer unique products or unique selling propositions. If this can be offered, growth can be rapid and sustained. With its uniqueness, a franchise must offer a high degree of standardization. (Aydin et. al., 43-53)

The reasons for international expansion of franchise systems are market potential, financial gain and saturated domestic markets. Global market demand is also very high for franchises. From a franchisee's perspective, the franchise is beneficial because it reduces risk by implementing a proven concept. From a governmental

perspective, there are also major benefits. The source country does not see a replacement of exports or an export of jobs. The recipient country sees franchising as requiring little outflow of foreign exchange, since the bulk of the profits generated remains within the country. (Aydin et. al., 43-53)

A major problem is foreign government intervention. Government restrictions on franchising and royalties hindered, lead to a separation between the company and its franchisee. Selection and training of franchisees represent another problem area. Many franchise systems have run into difficulty by expanding too quickly and granting franchises to unqualified entities. Although the local franchisee knows the market best, the franchisor still needs to understand the market for product adaptation and operational purposes. (Aydin et al., 43-53)

2.2.6 Management Contract Operations

As a method for developing international operations management contracts appears to have been increasingly used of late yet there has only been a limited amount of in-depth research conducted on their extent and use (Gabriel, 1967; Oravainen, 1979; Sharma, 1983; Brooke, 1985b). It has been estimated that management contracts may constitute around ten per cent of the global remittances between separate enterprises as a result of knowledge agreements (Brooke, 1985a, 15). Part of the reason for the difficulty in providing any indications of the dimensions of management contract use lies in the lack of official statistics. As well though, the term is used with different meanings by different organizations and the distinction between it and other contractual forms, such as licensing, sometimes becomes very blurred.

The management contract has been defined as “an arrangement under which operational control of an enterprise, which would otherwise be exercised by the board of directors or managers elected or appointed by its owners is vested by contract in a separate enterprise which performs the necessary managerial functions in return for a fee” (Pugh, 1961, 49). This definition is relatively broad, encompassing a wide range of variants: in each case of course the exact form of the contract is the outcome of a negotiation process. Nevertheless, the essence is that a company operates a foreign enterprise for a client organization. In this sense it is distinguished

from a licensing or franchising arrangement in that the contractor is responsible for actually fulfilling a technology transfer process whereas with the other contractual forms, despite various control mechanisms, the transferor relies on the recipient to efficiently implement the technology and operate the enterprise. The management contract is therefore a much more arm's length types of contractual relations.

In its basic form the management contract involves a clear separation of ownership and management of the client organization. Likewise the management contract is not linked with any other operation forms. The managerial service is provided for a fixed period and given fee. The know-how transferred may be in the form of either general management (management-know-how agreement) or technical management (technical know-how agreement). The contractee or client firm usually pays the salaries, social costs and fringe benefits of the managers involved. The target of the transfers may be either the contractee's existing organization or a new unit established for the contractee.

Under this relatively clear-cut arrangement the risks and rewards of the operation lie with the owner, although the management contractor may exercise a high degree of control through the terms of the contract owned subsidiary. Whatever effective control the contractor enjoys it is circumscribed by the lack of ultimate authority and a dependence on the owner for the provision of key resources, such as adequate financial support for the operation.

2.2.7 Subcontracting and Contract Manufacturing Operations

Michalet (1980, 39) has defined international sub-contracting as: " all export sales of articles which are ordered in advance, and where the giver of the order arranges the marketing. This would include sales by subsidiaries to their parents in multinational firms".

The key aspect of international subcontracting and international contract manufacturing is that the giver of the order (contractor) arranges the marketing, wherever that occurs, and it may apply to goods and services. International subcontracting exists when the foreign contractee produces only part of the final

product, and this goes into the contractor's production process. International contract manufacturing applies when the foreign contractee produces the final product, which then goes directly into the contractor's marketing process. (Terpstra 1983, 340-345)

The reasons why use the international subcontracting and contract manufacturing encompass broad environmental developments. At a broad level, some of the factors contributing to its growing use are: The growth and the expansion of international operations by multinational companies has created a ready framework for utilization of local or third country contract-based international manufacturing arrangements. (Luostarinen 1990, 112-124)

Another factor is that the differences in labor and other manufacturing costs across countries and when they represent important inputs in the production process, provide a strong justification for utilizing output from low cost locations. (Luostarinen 1990, 112-124)

The growth of international contract manufacturing has been strongly affected by the internationalization process of retailing activities. Retailers have been major instigators of the type of competition faced by manufacturers in the advanced countries. As experience, skills and contacts in international operations developed, retailers became adept at exploiting the many opportunities for sourcing in cheaper foreign production locations. The impact of this trend has been accentuated by the ability of the retailer to facilitate entry of the contract manufactured item through an established marketing and distribution network with the addition of the prestige of the retailer's name as an important element. (Luostarinen 1990, 112-124)

2.2.8 Project Operations

Project operations cover a broad mix of activities involved in the design and construction of different plants and facilities: such as housing, office buildings, factories, industrial plants, mining developments, defense establishment and social infrastructure facilities (Ramirez, 1985, 24).

Partial Project – project operators may supply on a partial basis, contributing only some part of the goods and services and know-how needed to assemble the total package, although perhaps constituting a complete sub-system, for example, the communications system for a new mine. Typically the project contributor in this will not have any control over the coordination and integration of the total project. This type of project is a partial one for the supplying company but part of a turnkey project from the buyer company's point of view. However, if the sub-system is being supplied to an existing plant then it is a partial project for both sides.

Turnkey Projects - The key aspect of the turnkey contract situation is that one party is responsible for setting up a plant and putting it into operation (U.N., 1983, 6). The turnkey responsibility generally includes: supply of technology and know-how, basic design and engineering, supply of complete plant and equipment, design and construction of civil works, commissioning of the total plant facilities up to the start-up stage (U.N., 1983, 6).

The supplier of the turnkey project in total will often be a major supplier of the plant and equipment (Sharma, 1984) or an international engineering and construction company. For example, a Swedish supplier of turnkey projects in the food processing industry typically only provides 25 per cent of the contract sum in its own equipment. "Another 10% is supplied by companies within the same ownership group while roughly 2/3 is bought from 30-40 external suppliers. Some 10 suppliers account for 80% of this externally supplied volume"(Mattson, 1980, 15). With large projects it is unusual for the principal to be able to supply all or even most of the elements itself, so that many opportunities exist for project suppliers as subcontractors.

The turnkey installation is completed up to the point of being an operational facility, and is then handed over to the buyer. For example, a communication sub-system may be complete and function on its own, but if it is only a contributor to a larger production unit it would be considered a turnkey project itself.

In world market, with a growing number of competitors, project operations have become a far more demanding form of international business in the 1990's. Nevertheless, by effective use of the project form as part of a long-term penetration

process, many companies have been able to generate continuing, substantial returns beyond the project itself. To achieve such benefits, project operations need to be combined with management contracts, licensing and other elements into a larger and extended package.

2.2.9 Subsidiary operations

Subsidiary operations tend to be used by companies after other operation modes in the process of internationalization. For manufacturing firms exporting normally precedes subsidiary establishment. As a result the nature of and reasons for such a move are bound to be affected by the type of experience generated by preceding operations. Likewise there is a learning process in establishing and maintaining foreign subsidiaries. The experience of the Australian company Brambles in Europe is illustrative of this point: "...when Brambles first went overseas 14 years ago into the British pallet business, it went into joint venture partnership with Guest Keen & Nettlefolds. Brambles was then a small company and wanted to spread its financial risks. It moved on to joint venture with GKN in Europe, and to the Cleanway/GKN joint venture in Britain...' They are very successful operations and GKN is a good partner, but we don't want our main overseas growth to be diluted through joint ventures. So we've expanded overseas in our own right'" (Thomas, 29/7/88, 127).

Research indicates that companies frequently do not consider the range of alternative modes on offer, nor of the many different forms of subsidiary operations, or locational possibilities (Larimo 1987; Buckley & Matthew, 1980). This is often because the stimulus to foreign investment is highly specific in character for example, the offer to sell a company in a particular country.

Subsidiary operations may be defined from two major points of view: as long term foreign investment flows from home country to a host country (macro approach) or as a way for a firm to enter and to penetrate into foreign markets (micro approach).

Long-term foreign investments are divided into direct and portfolio investments. Foreign direct investments are in an already existing company or in a company to be established abroad, in whose management and control the investor is participating

on the basis of the investment made. Foreign portfolio investments are investments in foreign securities (stocks, bonds) for the sake of dividends/interest without control for managerial purposes. Sometimes portfolio investment is used as a scanning device to evaluate whether the target firm would be suitable for acquisition.

As a micro term subsidiary operations abroad are established by a mother company thorough buying an existing company (acquisition strategy) or through building a unit from scratch (greenfield strategy), under a certain legal form and degree of ownership. The mother firm may be an industrial firm or a non-industrial firm, service firm.

The term "joint venture" is very commonly used in today's international business vocabulary. It has two major meanings: Joint contractual venture and joint equity venture. (Luostarinen 1990, 158-164)

A joint contractual venture comprises any form of association, which implies collaboration for a certain purpose between partners for a stipulated period of time, without sharing equity of the cooperating firms. Both partners are at the same level without having a buyer-seller relationship. In the following the term "joint venture" is used to denote equity joint venture. (Luostarinen 1990, 158-164)

A joint equity venture involves always sharing equity and risks and also participating in management between partners forming a continuing, profit-seeking relationship. An international joint equity venture indicates that one or more of the partners are foreign nationality. A mixed venture exists if one or more of the partners participating in the management of the venture and sharing the equity and risks are involved owned by a home, host or third country government. (Luostarinen 1990, 158-164)

The two meanings should be understood, otherwise confusion may occur. One partner may be considering a joint equity venture and the other different contractual joint venture alternatives, as was the case between a Finnish and a Chinese firm. Both partners lost time and money in two negotiation rounds. The Chinese partner had been considering a looser type of cooperation through a product development and production know-how exchange agreement and the Finnish partner had been

pondering whether it would be possible to get a majority or at least 50% in the joint venture to be established. A minority position was not acceptable because of the transfer of crucial technological know how included in that venture. For both partners the content of the term "joint venture" was absolutely clear yet fully different from each other.

2.3 Motivations to go abroad

Normally, management will consider international activities only when stimulated to do so. A variety of motivations can push and pull individuals and firms along the international path. Proactive motivations represent stimuli for firm-initiated strategic change. Reactive motivations describe stimuli that result in a firm's response and adaptation to changes imposed by the outside environment. In other words, firms with proactive motivations go abroad because they want to and reactive motivations have to go international. (Czinkota et. al. 1999, 368-390)

2.3.1 Proactive motivations

Profits are the major proactive motivation for international business. Management may perceive international sales as a potential source of higher profit margins or of more added-on profits. The profitability perceived when planning to go international is often quite different from the profitability actually obtained. Particularly in international start-up operations, initial profitability may be quite low. (Kotabe & Czinkota 1999, 637-658)

Unique products or a technological advantage can be another major stimulus. A firm may produce goods or services that are not widely available from international competitors. Many firms believe that they offer unique products or services, even though this may not be the case occasionally. If products or technologies are unique, they certainly can provide a competitive edge. What needs to be considered is how long such an advantage will last. (Czinkota et. al. 1999, 368-390)

Special knowledge about foreign customers or market situations may be another proactive stimulus. Such knowledge may result from particular insights by a firm,

special contact an individual may have, in-depth research or simply from being in the right place at the right time. (Czinkota et. al. 1999, 368-390)

Another motivation reflects the *desire, drive and enthusiasm* of management toward international business activities. The managerial commitment can exist simply because managers like to be part of a firm that engages in international business. (Yang et. al. 1992, 82-96)

Tax benefits can also play a major motivating role. Many governments use preferential tax treatment to encourage exports. As a result of the tax benefits, firms either can offer their product at a lower cost in foreign markets or can accumulate a higher profit. (Arpan et. al. 1985)

A final major proactive motivation involves *economies of scale*. International activities may enable the firm to increase its output and therefore rise more rapidly on the learning curve. (Czinkota etc. 1999, 371)

2.3.2 Reactive motivations

A second type of motivation influences firms to respond to environmental changes and pressures rather than to attempt to blaze trails. *Competitive pressures* are one example. A company may fear losing domestic market share to competing firms that have benefited from the economies of scale gained through international business activities. It may also fear losing foreign markets permanently to competitors that have decided to focus on these markets. (Kotabe & Czinkota 1999, 637-658)

Similarly, *overproduction* can result in a major reactive motivation. During downturns in the domestic business cycle, foreign markets have historically provided an ideal outlet for excess inventories. International business expansion motivated by overproduction usually does not represent full commitment by management, but rather a safety-valve activity. As soon as domestic demand returns to previous levels, international business activities are curtailed or even terminated. (Czinkota etc. 1999, 370-390)

Declining domestic sales whether measured in sales volume or market share, have a similar motivating effect. Goods marketed domestically may be at the declining stage of their product life cycle. Instead of attempting to push back the life cycle process domestically or in addition to such an effort, firms may opt to prolong the product life cycle by expanding the market. (Yang et. al. 1992, 82-96)

Excess capacity can also be a powerful motivator. If equipment for production is not fully utilized, firms may see expansion abroad as an ideal way to achieve broader distribution of fixed costs. Alternatively, if all fixed costs are assigned to domestic production, the firm can penetrate foreign markets with a pricing scheme that focuses mainly on variable cost. (Yang et. al. 1992, 82-96)

A final major reactive motivation is that of *proximity to customers and ports*. Physical and psychological closeness to the international market can often play a major role in the international business activities of the firm. (Yang et. al. 1992, 82-96)

In general, firms that are most successful in international business are usually motivated by proactive factors. Further, they tend to be more marketing and strategy oriented than reactive firms, which has as their major concern operational issues. Proactive firms are more likely to solicit their first international order, whereas reactive firms frequently begin international activities after receiving an unsolicited order from abroad.

2.3.3 Strategic effects of going international

As firm goes international, unusual things can happen to both risk and profit. Management's perception of risk exposure grows in light of the gradual development of expertise, the many concerns about engaging in a new activity, and uncertainty about the new environment it is about to enter. Domestically, the firm has gradually learned about the market and therefore managed to decrease its risk. In the course of international expansion the firm now encounters new and unfamiliar factors, exposing it to increased risk. (Solberg 1997, 9-30)

In the longer term, increasing familiarity with international markets and the diversification benefits of serving multiple markets will decrease the firm's risk and increase profitability as well. In the short term, managers may face an unusual and perhaps unacceptable situation, when risk rises by decreasing profitability. (Solberg 1997, 9-30)

2.3.4 Restrictions and promotions of import and export

Increasingly, the capability of policymakers simply to focus on domestic issues is reduced because of global linkages in trade and investment. In addition, traditional international institutions concerned with these policies have been weakened, and the developmental conflict among nations has been sharpened. As a result, there is a tendency by many nations to restrict imports either through tariff or nontariff barriers. Investment restrictions also are used to control influences from abroad.

Nations also undertake efforts to promote exports through information and advice, production and marketing support, and financial assistance. While helpful to the individual firm, such measures may only assist firms in efforts that the profit motive would encourage them to do anyway. Governments also promote imports and foreign direct investment in order to receive needed products or to attract economic activity.

Restrictions of imports

Most countries worldwide maintain at least a surface-level conformity with international principles. However, many exert substantial restraints on free trade through import controls and barriers. They are found particularly in countries that suffer from major trade deficits or major infrastructure problems, causing them to enter into voluntary restraint agreements with trading partners or to selectively apply trade-restricting measures such as tariffs, quotas or nontariff barriers against trading partner. (Czinkota etc. 1999, 78-92)

Tariffs are taxes based primarily on the value of imported goods and services. *Quotas* are restrictions on the number of foreign products that can be imported. *Nontariff barriers* consist of a variety of measures such as testing, certification or

simply bureaucratic hurdles that have the effect of restricting imports. All of these measures tend to raise the price of imported goods. They therefore constitute a transfer of funds from the buyers of imports to the government and to the domestic producers of such products. (Arpan et. al. 1985)

Voluntary restraint agreements are designed to help domestic industries reorganize, restructure and recapture production prominence. Even though officially voluntary, these agreements are usually implemented through severe threats against trading partners. Due to their “voluntary” nature, the agreements are not subject to any previously negotiated bilateral or multilateral trade accords. (Kotabe & Czinkota 1999, 637-658)

When nations do not resort to the subtle mechanism of voluntary agreements to affect trade flows, they often impose tariffs and quotas. Many countries use *antidumping* laws to impose tariffs on imports. Antidumping laws are designed to help domestic industries that are injured by unfair competition from abroad due to products being “dumped” on them. Dumping may involve selling goods overseas at prices lower than those in the exporter’s home market or at a price below the cost of production or both. The growing use of antidumping measures by governments around the world complicates the pricing decisions of exporters. Large domestic firms, on the other hand, can use the antidumping process to obtain strategic shelter from foreign competitors. (Kotabe & Czinkota 1999, 637-658)

The third major method by which imports have been restricted is nontariff barriers. These consist of buy-domestic campaigns, preferential treatment for domestic bidders compared with foreign bidders, national standards that are not comparable to international standards, and an emphasis on the design rather than the performance of products. (Arpan et. al. 1985)

One other way in which imports are sometimes reduced is by tightening market access and entry of foreign products through involved procedures and inspections. Probably the most famous are the measures implemented by France. In order to stop or at least reduce the importation of foreign video recorders, the French government ruled that all of them had to be sent to the customs station at Poitiers. This

customhouse was located away from major transport routes, woefully understaffed and open only a few days each week. In addition, the few customs agents at Poitiers insisted on opening each package separately to inspect the merchandise. Within a few weeks, imports of video recorders came to halt. Members of the French government, however, were able to point to the fact that they had not restrained trade at all. They had only made some insignificant changes in the procedures of domestic governmental actions. (Czinkota etc. 1999, 78-92)

The discussion of import restrictions has focused thus far on merchandise trade. Similar restrictions are applicable to investment flows and, by extension, to international trade services. In order to protect ownership, control and development of domestic industries, many countries impose varying restrictions on investment capital flows. Most frequently, they are in the form of investment-screening agencies that decide whether any particular foreign investment project is sufficiently meritorious to warrant execution. Most developing countries have an agency that scrutinizes foreign investments. There the special government permission must be obtained for investment projects. This permission frequently carries with it certain conditions, such as levels of ownership permitted, levels of dividends that can be repatriated, numbers of jobs that must be created or the extent to which management can be carried out by individuals from abroad. (Kotabe & Czinkota 1999, 637-658)

Restrictions of exports

In addition to imposing restraints on imports, nations also control their exports. The reasons are short supply, national security and foreign policy purposes or the desire to retain capital. The United States, for example regards trade as a privilege of the firm, granted by government, rather than a right or a necessity. U.S. legislation to control exports focuses on *national security* controls. That is the control of weapons exports or high-technology exports that might adversely affect the safety of the nation.

In addition exports can be controlled for reasons of foreign policy and short supply. These controls restrict the international business opportunities of firms if a government believes that such a restriction would send a necessary foreign policy

message to another country. Such action may be undertaken regardless of whether the message will have any impact or whether companies in other nations can easily supply similar products. (Kotabe & Czinkota 1999, 637-658)

Many nations also restrict exports of capital, because *capital flight* is a major problem for them. Particularly in situations where countries lack necessary foreign exchange reserves, governments are likely to place restrictions on capital outflow. In essence, government claims to have higher priorities for capital than its citizens. They, in turn, often believe that the return on investment or the safety of the capital is not sufficiently ensured in their own countries. The reason may be governmental measures or domestic economic factors, such as inflation. These holders of capital want to invest abroad. By doing so, however, they deprive their domestic economy of much-needed investment funds. (Guisinger 1987, 18)

Once governments impose restrictions on the export of funds, the desire to transfer capital abroad only increases. Because companies and individuals are ingenious in their efforts to achieve capital flight, governments, particularly in developing countries, continue to suffer. In addition, few new outside investors will enter the country because they fear that dividends and profits will not be remitted easily. (Guisinger 1987, 18)

Export promotion efforts

The desire to increase participation in international trade and investment flows has led nations to implement export promotion programs. These programs are designed primarily to help domestic firms enter and maintain their position in international markets and to match or counteract similar export promotion efforts by other nations. (Czinkota etc. 1999, 83)

Most governments supply some support to their firms participating or planning to participate in international trade. Typically, this support falls into one of four categories: export information and advice, production support, marketing support, or finance and guarantees. While such support is widespread and growing, its intensity varies by country. (Kotabe & Czinkota 1999, 637-658)

Import promotion efforts

Some countries have also developed import promotion measures. The measures are implemented primarily by nations that have accumulated and maintained large balance-of-trade surpluses. They hope to allay other nation's fears of continued imbalances and to gradually redirect trade flows.

Many countries are also implementing policy measures to attract foreign direct investment. These policies can be the result of the needs of poorer countries to attract additional foreign capital to fuel economic growth without taking out more loans that call for fixed schedules of repayment. Industrialized nations also participate in these efforts since governments are under pressure to provide jobs for their citizens and have come to recognize that foreign direct investment can serve as a major means to increase employment and income. (Czinkota etc. 1999, 85-92)

Incentives used by policymakers to facilitate such investments are mainly of three types: fiscal, financial, and nonfinancial. *Fiscal incentives* are specific tax measures designed to attract the foreign investor. They typically consist of special depreciation allowances; tax credits or rebates, special deductions for capital expenditures, tax holidays, and the reduction of tax burdens on the investor. *Financial incentives* offer special funding for the investor by providing, for example, land or building, loans, and loan guarantees. *Nonfinancial incentives* can consist of guaranteed government purchases; special protection from competition through tariffs, import quotas, and local content requirements; and investments in infrastructure facilities. (Arpan et. al. 1985)

All of these incentives are designed primarily to attract more industry and therefore create more jobs. They may slightly alter the advantage of a region and therefore make it more palatable for the investor to choose to invest in that region. By themselves, they are unlikely to spur an investment decision if proper market conditions do not exist. (Arpan et. al. 1985)

2.4 Integration

In this category the economic integration is discussed in general to give an idea how countries globally have integrated and built blocs. Because of the growing importance of the integration it is necessary to explain how and why different regional groupings based on economics are created.

Building blocs of worldwide free trade

Regional groupings based on economics will become increasingly important in the future. Countries around the globe are making efforts to suppress national interests in favor regional ones. A total of thirty-two such groupings is estimated to be in existence. Three in Europe, four in the Middle East, five in Asia and ten each in Africa and the Americas. With respect to the three major blocks, the American, European and Asian, trade inside these blocks has grown at rapid pace, while trading among these blocks or with outsiders is either declining or growing far more moderately. (Vihma 1993, 1-9)

Some of these groupings around the world have the superstructure of nation-states (European Union), Some (ASEAN free trade area) are multinational agreements that may be more political arrangements than cohesive trading blocks at present. Some arrangements are not trading blocks per se, but work to further them. The Free Trade Area of the Americas is a foreign policy initiative designed to further democracy in the region through incentives to capitalistic development and trade liberalization. (Vihma 1993, 1-9)

The Andean Common Market and Mercosur have both indicated an intention to negotiate with the parties of the North American Free Trade Agreement (NAFTA) to create a hemispheric market. Regional economic integration in Asia has been driven more by market forces than by treaties and by a need to maintain balance in negotiations with Europe and North America. Broader formal agreements are in formative stages. The Asia Pacific Economic Cooperation (APEC) initiated in 1988 would bring together partners from multiple continents. AFTA members are joined

such economic powerhouses as China, South Korea, Taiwan and the United States. (Vihma 1993, 1-9)

Regional groupings are constantly in a state of development. In 1995, informal proposals were made to create a new block between NAFTA and EU members called TAFTA, the Transatlantic Free Trade Area. Since the elimination of the Soviet Union in 1991, 12 former republics have tried to forge common economic policies, but thus far only Belarus, Kazakhstan and Russia are signatories to a free-trade pact. (Ronkainen 1997, 23-26)

Regional groupings will mean that companies are facing ever-intensifying competition and trading difficulties for sales inside a bloc. In the long term, firms will come under pressure to globalize and source locally. Actions of these global companies may also allay fears that regional blocs are nothing but protectionism on a grander scale. (Ronkainen 1997, 23-26)

Levels of Economic Integration

A trading group is a preferential economic arrangement among a group of countries. The *free trade area* is the least restrictive and loosest form of economic integration among countries. In a free trade area, all barriers to trade among member countries are removed. Therefore, goods and services are freely traded among member countries in much the same way that they flow freely between inside the one country. No discriminatory taxes, quotas, tariffs or other trade barriers are allowed. Sometimes a free trade area is formed only for certain classes of goods and services. The most notable feature of free trade area is that each country continues to set its own policies in relation to nonmembers. (Waelbroeck 1980) The most notable free trade areas are the European Free Trade Area (EFTA) and the North American Free Trade Agreement (NAFTA).

The *customs union* is one step further along the spectrum of economic integration. Like members of free trade area, members of a customs union dismantle barriers to trade in goods and services among themselves. In addition the customs union establishes a common trade policy with respect to nonmembers. Typically this takes

the form of a common external tariff, where imports from nonmembers are subject to the same tariff when sold to any member country. Tariff revenues are then shared among members according to a prespecified formula. (Waelbroeck 1980)

Further still along the spectrum of economic integration is the *common market*. It has no barriers to trade among members and has a common external policy. Factors of production are also mobile among members. Factors of production include labor, capital and technology. Thus restrictions on immigration, emigration and cross-border investment are abolished. The importance of *factor mobility* for economic growth cannot be overstated. When factors of production are freely mobile, then capital, labor and technology may be employed in their most productive uses. (Czinkota et. al. 1999, 253-286)

Despite the obvious benefits, members of a common market must be prepared to cooperate closely in monetary, fiscal and employment policies. Furthermore, while a common market will enhance the productivity of members in the aggregate, it is by no means clear that individual member countries will always benefit. (Czinkota et. al. 1999, 253-286)

Integration in Asia

The development in Asia has been quite different from that in Europe and in the Americas. While European and North American arrangements have been driven by political will, market forces may compel politicians in Asia to move toward formal integration. While Japan is the dominant force in the area and might seem the choice to take leadership in such endeavor, neither the Japanese themselves nor the other nations want Japan to do it. In terms of economic and political distance, the potential member countries are far from each other, especially compared to the EU. (Thornton 1992, 131-132)

However, Asian interest in regional integration is increasing for pragmatic reasons. First, European and American markets are significant for the Asian producers and some type of organizations or bloc may be needed to maintain leverage and balance against the two other blocs. Second given that much of the growth in trade for the nations in the region is from intra-Asian trade, having a common understanding and policies will become necessary. A future arrangement will most likely use the frame of the most established arrangement in the region, the Association of South East Asian Nations (ASEAN). (Krugman 1992, 10-13)

In 1991 ASEAN members (Brunei, Indonesia, Malaysia, Philippines, Singapore, Vietnam, Thailand, Laos and Myanmar) announced the formation of a customs union called ASEAN Free Trade Area (AFTA), with completion expected by 2003. The Malaysians have pushed for the formation of the East Asia Economic Group (EAEG), which would add Hong Kong, Japan, South Korea and Taiwan to the list. This proposal makes sense, since without Japan and the rapidly industrializing countries of the region such as South Korea and Taiwan; the effect of the arrangement would be small. Japan's reaction has generally been negative toward all types of regionalization efforts, mainly because it has had the most to gain from free-trade efforts. (Czinkota & Kotabe 1992, 49-56)

Ethics and international business

As the global economy becomes increasingly interdependent, cultural conflict becomes more prevalent. At a same time, societal concern for ethical corporate behavior is on the rise. These two forces intersect to highlight a particular problem of multinational businesses and any company involved in international trade or business. It is the problem of making ethical decisions when cultures have contradictory or inconsistent ethical perspectives. (Kohls etc. 1994, 31-35)

Alternatives for responding to cross-cultural ethical conflict form a continuum, from complete adaptation to the host country's ethical standards to complete insistence on the application of home-country standards. (Kohls etc. 1994, 31-35)

The view of adaptation encourages managers to become more familiar with a host culture, to avoid offending native sensibilities, and to build effective working relationships based on respect for the way things are done in the host country. Adaptation is also supported by the ethical stance of cultural relativism, which claims that the standards of each culture determine what is right in that culture. (Kohls etc. 1994, 31-35)

On the other hand, many serious students of ethics are dissatisfied with any kind of relativism. They maintain that ethical standards are universal, and that cultural behavior that does not meet those standards should be identified as unethical. Thus, supporting governments that oppress their people or supporting ways of doing business that do not respect human life or that depend on deception are unacceptable, no matter what the culture. (Kohls etc. 1994, 31-35)

In fact, neither adaptation nor relativism is satisfactory by itself. As managers face ethical conflicts, the appropriate strategies for dealing with them will depend on the nature of the specific ethical situation. (Kohls etc. 1994, 31-35)

2.5 Internationalization as a process

2.5.1 Concept of Internationalization

At a very outset it is difficult to discuss a 'theory of internationalization' because even the term itself has not been clearly defined. It tends to be used roughly to describe the outward movement in an individual firm's or larger grouping's international operations (Luostarinen, 1970 & 1979; Turnbull, 1985). The definition for the internationalization could be as following: "the process of increasing involvement in international operations." An important reason for adopting a broader concept of internationalization is that both sides of the process, i.e. both inward and outward, have become more closely linked in the dynamics of international trade. (Luostarinen, 1978/1, 7-8 and 18-20).

The growth of counter trade in its many forms, from pure barter to buy-back arrangements and offset policies is indicative of the way in which outward growth has become tied in with inward growth. (Khoury, 1984). In effect, counter trade has meant that, for many companies, success in outward activities is partly dependent on the ability to perform inward operations. This has led to a number of large companies setting up trading arms to facilitate the process (Cohen and Zysman, 1986).

Having put forward a working definition of "internationalisation" it should be stressed that once a company has embarked on the process, there is no inevitability about its continuance. The evidence indicates that reverse or "de-internationalisation" can occur at any stage, as the example of Chrysler and other disinvestments in the late 1970's illustrate, but are particularly likely in the early stages of export development (Boddewyn, 1979). De-internationalization may again be followed by re-internationalization. As a result of the learning process which flows from the first internationalisation, then de-internationalisation, the company may decide to proceed along the internationalisation path again but on a much more experienced basis, avoiding the crucial mistakes of earlier efforts (Luostarinen, 1979, 118, 201).

2.5.2 Dimensions of Internationalization

Operation method

As companies increase their level of international involvement there is tendency for them to change the methods by which they serve foreign markets (Juul and Walters, 1987). This change occurs in the direction of increasing commitment, a typical pattern being from no exporting, to exporting via an agent/importer, to a sales subsidiary and finally to a production subsidiary. One of the reasons for the considerable attention on the operational method as a means of assessing a pattern of internationalisation is that it does represent a more clearly overt manifestation of the overall process.

Sometimes the sheer success of one method of operation, for example exporting, causes the removal of import barriers by a foreign government thereby necessitating a shift to some other form such as licensing or foreign investment if a market presence is to be maintained. It is difficult to go far in the internationalisation process simply by using one preferred operational method.

Personnel Capability

The success of internationalisation in any company depends heavily on the type of people both initiating and carrying through the various steps in the process, and on overall personnel policies. Lorange (1986, 133) has argued, "The human resource function is particularly critical to successful implementation of cooperative ventures...." In the initial exporting phase the background of the decision-maker, in such areas as work and foreign experience, education and language training, has been shown to be potentially important in the preparedness to commit a firm to the exporting activity (Reid, 1981).

At general level though, internationalisation both feeds upon and contributes to the development of international knowledge, skills and experience of the people involved (Johanson and Vahlne, 1977). While learning by doing appears to be a key part of

the whole process, it is also possible to obtain some assistance through effective training and recruitment policies.

Organizational Structure

As the administrative and organizational demands generally of carrying out international operations grow and diversify, the organizational structure for handling such demands ultimately needs to respond. A variety of formal and informal organizational arrangements have been used by companies in different countries to cope with the increasing amount and complexity of continuing internationalisation (Hedlund, 1984). The changes and their sophistication as the company seeks to improve the organizational mechanism and focus of international operations, provide a further signpost of the state of internationalisation. Organizational changes are often a clear statement of commitment to the objectives of international involvement.

A research into Finnish firms (Österberg, 1983) investigated 19 industrial firms and showed that there was a clear response in organizational structure to the demands of internationalisation, but the changes were light and elastic rather than being wholesale adjustments. For example, in the beginning subsidiaries were located under top management but were later moved under the managers of the foreign trade departments of the divisions or strategic business units.

2.5.3 Patterns of Internationalization

At a beginning a "pattern" need to be clarified. An internationalization pattern for a particular firm might be measured in terms of a particular target country, or by summing the patterns for all countries in which it is involved so that an overall company pattern might be obtained. The summation could then be carried through to a country or global level (Luostarinen, 1979, 128-178). Because of situational factors such as host government policy, it could be expected that patterns at the target country level would differ more than those at the firm level.

Target Country Patterns

Typically the growth of foreign establishments is distinguished by a series of small, cumulative steps over time: the setting-up of a sales subsidiary was preceded by an agency operation in about three-quarters of cases. In a study of 250 Finnish sales subsidiaries abroad in 1980 it was found that 84% had been established in markets where parent firms had earlier export experience (Luostarinen, 1979, 12-15). An examination of 59 Finnish production subsidiaries established abroad in the period 1978-85 found that direct investment was preceded by other operations in the target countries in 83% of the cases (Larimo, 1987, 169). A Danish research into 176 direct foreign investments revealed that about 72% were preceded by earlier operations (Schoultz and Vestergaard, 1985, 20).

Even if the stages pattern has been shown to be relatively common, it should be stressed that there is often great diversity in the exact structure of the establishment chain. Luostarinen (1970, 133-134), for example, presents two different four-staged penetration processes leading to the production subsidiary phase.

Company Patterns

At the overall firm level, the evolutionary pattern leading up to the use of direct manufacturing investment seems to at least as valid as at the target country level. The pattern has been most strongly confirmed by the FIBO's project's studies of the internationalization of Finnish firms. In a study of 1006 manufacturing firms with foreign operations of any type, Luostarinen (1979, 122-123) found that 98% had used non-investment marketing operations (direct or indirect exports) as their first operation abroad; 64% had used direct investment marketing operations (sales or marketing subsidiaries) as their second operation method; 44% non-investment production operations (licensing, contract manufacturing, etc.) as their third operation mode abroad and 60% direct production investments as their fourth penetration method abroad.

In another FIBO study it was found that of the 133 mother firms only four (3%) had started their internationalization process by establishing sales subsidiaries without

preceding exports (Larimo, 1987, 46). Larimo's later study of overall firm patterns revealed that "in every firm apart from four (total = 54 firms), the export stage and the sales subsidiary stage. Each of the four firms had exported before making the foreign direct investment" (Larimo, 1987, 170).

3. Malaysian water industry

3.1 Achievements and Outlook

The Malaysian water industry has shown substantial progress as the nation accelerates towards becoming an industrialized country. Intensive efforts have been made in the past years to meet the ever-increasing domestic and industrial water demand and to address various water-related issues. Several measures are also in place to face future challenges and to synchronize the water sector's growth to keep in step with the country's overall industrialization process.

In the Seventh Malaysia Plan, RM 2.746 million was allocated for water supply projects, and RM 2.385 million had been disbursed up to December 2000. The water supply projects included source works, treatment plants, distribution systems as well as rehabilitation and improvement programs. (Malaysia water industry guide 2001, 29)

By the end of the Plan period, four new dams were completed. They were the Kelinchi and Gemencheh Dams in Negeri Sembilan, the Telok Bahang Dam in Penang and the Babagong Dam in Sabah bringing the total number of dams in operation to 69 (See Appendix 1) with the total storage capacity of 29.9 billion cubic meters of water. Another newly planned dam in Pahang is the Chereh Dam, which is expected to commence construction works in the year 2001. Of these, 35 were developed for water supply. 16 for multipurpose use while the remaining were for irrigation and hydropower. (Malaysia water industry guide 2001, 30)

Efforts were also taken to enhance the sharing of water resources through inter-basin and inter-state water transfer. One inter-basin project was the transfer of raw water from the Kelinchi Dam in the Muar River Basin to the Sungai Terip Dam in the Linggi

River Basin in Negeri Sembilan. The study and design for the inter-state water transfer from Pahang to Selangor was also started in 1999 and its construction scheduled to commence in the year 2001 and completed by the year 2007 providing a total of 2.260 million liters of water a day to the Klang Valley. This project involves the construction of the Kelau Dam, 45-kilometer tunnel, intake works, pipeline and mechanical and electrical works.(Malaysia water industry guide 2001, 30)

3.2 Quality of Water and Pipes

Other than developing new water supply projects, measures were also taken to improve the efficiency as well as the water quality of the existing water supply systems. These were taken through the rehabilitation and upgrading of treatment plants and the distribution systems to reduce the rate of *non-revenue water (NRW)* (See Appendix 2). A total of 1.681 km lengths of old asbestos cement pipes were replaced with new pipes under this program.

Active Leakage Control and Revenue Meter Change Program were also undertaken to further reduce the *NRW*. A total of RM 475 million was spent under this program in 20 districts. Consequently, the national *NRW* rate decreased from about 40 percent in 1995 to 37 percent in 1998. With the implementation of the above programs and greater emphasis given to the reduction of *NRW*, it is expected that by the year 2015 the figure will be reduced to a more acceptable value of 20 percent. (Malaysia water industry guide 2001, 30)

During the Seventh Malaysia Plan, several water supply projects were privatized. These included the construction and completion of the Sungai Selangor Phase II project on Build-Operate-Transfer (BOT) basis. The Sungai Selangor Phase III project which involved the construction of the Sungai Selangor Dam and two treatment plants with a total capacity of 1.050 mld were also privatized in year 2000 and currently under construction. (The Seventh Malaysia Plan, (1996-2000), 332)

3.3 Political planning

To meet the ever increasing domestic and industrial water demand due to the population growth and rapid development, various water resources development were undertaken. Efforts were also made to improve management as well as to ensure better distribution of water resources among various river basins both within the states and inter-state water transfer. In this regard, the formation of *the National Water Resources Council (NWRC)* in June 1998 marked a significant milestone in water resources planning and management, which for the first time was supported by both the Federal and State Governments.

Together with the formation of this council, a National Water Policy is being drafted and a new National Water Master Plan covering a planning horizon up to the year 2050 was formulated. The Master Plan lays out the strategic directions and forms the basis for the future development and sustainable development and conservation of the nation's water resources.

The *NWRC*, which acts as a coordinating and integrating body for the planning and management of water resources, will among others formulate a national water policy as well as to establish guidelines on catchments management in order to ensure long term sustainability. As a long-term measure, the National Water Resources Study, Phase I for Peninsular Malaysia was commissioned in February 1998 and was completed in December 1999. With the completion of the study an integrated and long-term sustainable development of the nation's available water resources in Peninsular Malaysia can now be planned to meet the water requirements up to the year 2050. (The National Water Resources Study 1999, 14)

Under the Eighth Malaysia Plan, emphasis will be placed on Water Demand Management (See Appendix 3) as a significant management tool to not only augment, but also more importantly, to "stretch" existing supplies and delay the development of large capital intensive structures. Ample analysis to lower or mitigate the proposed demand in a more socially beneficial manner will also be carried out. A crucial part of demand management is a program to tackle water leakage. This program will be continued during the Eighth Malaysia Plan period via a program to

reduce water losses through the replacement of existing asbestos cement pipelines (See Appendix 4) as well as old pipes that are leaking and the refurbishment of old treatment plants. The target is to reduce the percentage of unaccounted water from the current 37 percent to 20 percent by the year 2015. (The Eight Malaysia Plan (2001-2005), 311)

As for demand management and conservation, more efforts will be directed towards raising the awareness and public education. Campaigns will be conducted to stress the critical importance of water in daily life and the need to conserve even in non-crisis times, including the links between water conservation and environmental quality and the economic savings accruing from conservation. Amendments to building regulations to ensure new homes and industrial facilities are fitted with efficient appliances and devices will also be looked into. (The Eight Malaysia Plan (2001-2005), 315)

3.4 Rural Water Supply

The national water supply coverage is 94 percent, with 98 percent coverage for urban areas and 90 percent for rural areas (See Appendix 5). In addition to providing for increasing urban demands, the Government will continue to emphasize the importance of providing good quality drinking water to small rural communities.

Program to uplift the quality of life and facilitate greater opportunities for economic growth in the rural areas will be implemented despite the huge cost to be incurred in developing such facilities to these areas. It is targeted that the national rural water supply coverage will be increased from the current 87 percent to 91 percent by the year 2005. States like Kedah, Pahang, Perlis, Terengganu and Sarawak with low rural service factor will have their rural coverage improved to 90 percent and for the states of Kelantan and Sabah to 60 percent. (The Eight Malaysia Plan (2001-2005), 321)

3.4.1 Future Outlook

The Federal and State Governments have a long-term national master plan for an integrated approach to the development and management of the limited water resources available for the development of water supply. The study covers a planning horizon for the water needs up to the year 2050. It also assesses the quality and quantity of water available for domestic, industrial, irrigation, hydropower and other uses for the years 2000, 2010, 2020, 2030, 2040 and 2050. The study was also used to prepare for development projects in the Eighth Malaysia Plan and subsequent Malaysia Plans. (Malaysia water industry guide 2001, 32)

3.4.2 Water Resource Development Projects

In the *NWRS (the National Water Resources Study)*, a total of 62 water resource development projects, including the construction of 47 dams to form impounding reservoirs, had been identified for new source works for implementation over the next 50 years. Sites for dams and their catchments areas had also been identified in all the states in Peninsular Malaysia so that the action can be taken by the State Governments to gazette them. The conservation of the proposed sites as identified under the NWRS is essential not only to ensure that source works can be implemented according to plan but also because there may not be any other suitable alternative sites available for the conservation of the water resources and dam sites.

Protection of the rivers and river basins of such water sources are of paramount importance to ensure that they are not polluted. Effective river basin management strategies are needed to include the regulation and protection of rivers, control of pollution discharge, establishment of stream standards, enforcement and monitoring of the river quality. (The National Water Resources Study 1999, 17)

3.5 Legislations Related to Water

Since 1957, the jurisdictions and legislative powers in all aspects of water are distributed between the Federal Government and the State Governments in accordance with the Legislative Lists of the Federal Constitution.

Most of the water-related Federal laws valid in Peninsular Malaysia are generally not applicable to the States of Sabah and Sarawak. However the laws of these two States are not substantially different from those in Peninsular Malaysia.

Water Act 1920 (Revised 1989). Under the Waters Act, the entire property in and control of all rivers in any State is vested solely in the Ruler of such State.

No person may in any manner obstruct or interfere with any river except under and in all accordance with the terms of a license under this Act. A license to divert water from a river in any district for private or domestic purpose, or to use water in the cultivation of rice, industrial and other purposes may be granted by the District Officer of such district with the approval of the state Authority.

This Act only applies to the States of Negeri Sembilan, Pahang, Perak, Selangor, Melaka and Pulau Pinang. For the other States there are similar provisions in the State Enactments. (Malaysia water industry guide 2001, 33)

Geological Survey Act, 1974. The legislation governing the extraction of groundwater is the Geological Survey Act, 1974, which requires that any person who develops a well for the purpose of extracting water have to notify the Director General of the Geological Survey Department. This requirement does not apply to any well, which is less than 30 feet (9.15m) in depth without reaching bedrock or yields less than 500 gallons (2.273 liter) of water per day and is used only for domestic purposes. (Malaysia water industry guide 2001, 34)

Environmental Quality Act, 1974. The Environmental Quality (Prescribed Activities) (Environmental Impact Assessment) Order, 1987 enforced under the Environmental Quality Act, 1974 governs the environmental impacts due to the prescribed activities. One of which is the construction of 200 hectares or more. EIA is also required for the groundwater development for industrial, agricultural or urban water supply for quantity greater than 4.500 m³ per day. (Malaysia water industry guide 2001, 34)

Water Supply Enactments. The Water Supply Enactment 1955 empowers *the State Water Supply Authorities (SWSA)* to supply water to domestic and trade consumers. This enactment also empowers the SWSA to lay water mains and distribution pipes across or under any street and through or under any enclosed land making reasonable compensation for any damage done. This Enactment only applies to the States of Pahang and Perak. For the other States there are similar provisions in the state Enactments.

In Johor, Terengganu and Pulau Pinang, private limited companies were formed to take over the water supply services through the process of corporatization and privatization. These were established under the provisions of the revised Water Supply Enactments to the respective States.

To facilitate the impending privatization of the water supply services in Negeri Sembilan and Selangor, the Negeri Sembilan Water Supply Enactment, 1997 and the Selangor Water Supply Enactment 1997 has also been enacted.

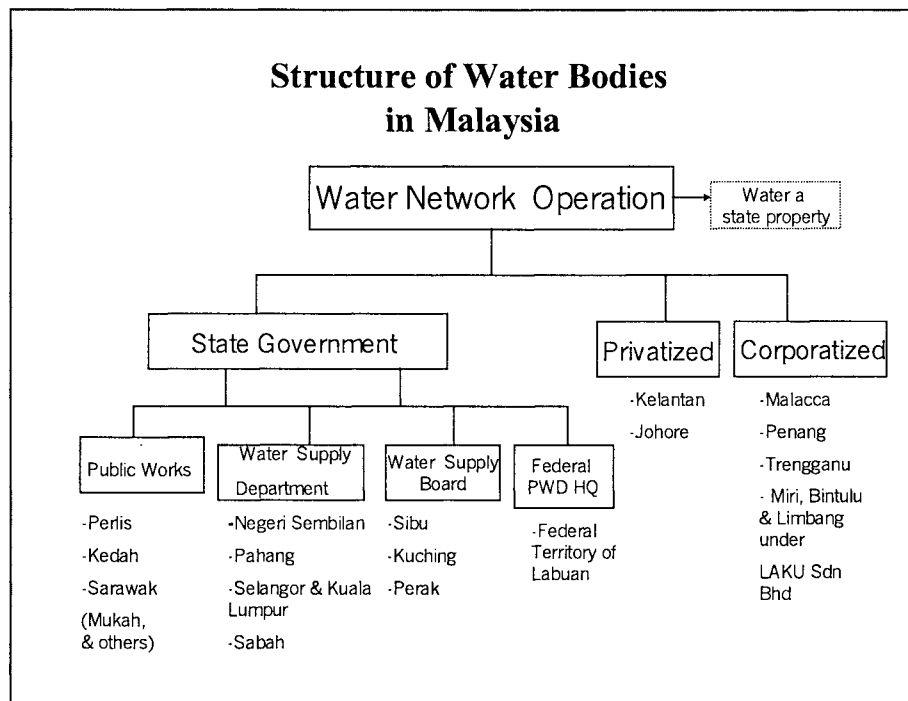
Under the provisions of the Water Supply Enactments of the respective states where the water supply departments had been privatized or corporatized, water supply regulatory bodies have to be set up. The functions of the corporatized or privatized companies and to regulate and enforce the provisions of the enactments to ensure that the state governments as well as the consumer's interests are safeguarded. (Malaysia water industry guide 2001, 34)

The proposed Safe Drinking Water Act. At the present the quality of treated water supplied by the SWSA/Companies is based on WHO standards. To further enforce compliance of quality, the Ministry of Health is in the process of drafting the "Safe Drinking Water Act" to control the quality of drinking water supplied to the public. Under this proposed Act, the supply of drinking water, which does not satisfy specific standards, would be an offence. (Malaysia water industry guide 2001, 34)

3.6 Structure of water network Distribution System

Under the Federal constitutions of Malaysia, water supply is a state matter and comes under the responsibilities of the individual state. Each state government is responsible for the development, operations and maintenance of water supplies. The state exercises this responsibility through either the State *Public Works Department (PWD)*, State Water Supply Department (SWSD), State Water Supply Board (WSB) or State Water Supply Corporation (SWSC). (Seah 2000, 8)

CHART 1 Structure of different water bodies in Malaysia (Seah 2000, 8)



The water supply branch of the Federal *PWD* acts as a federal agency for consultation and technical advice to the state water authorities as well as a coordinating agency for all water supply projects funded by the federal government in the form of both grants and loans. In addition it plays an important role of maintaining engineering standards for water supply practice in Malaysia. As such it is adopting the *Labuan GIS project* as a model for all water bodies to emulate. (Seah 2000, 8)

The State Works department and the State Water Supply department are administered by the State while State Water Supply Board is more autonomous in financial and administrative operations. They practice full accounting and recruit their own staffs. They include states like Kuching, Sibu and Perak. (Seah 2000, 9)

From the mid nineties the water supply department of several states like Johore, Kelantan, Negeri Sembilan, Trengganu, Sarawak and Pulau Pinang has undergone the process of privatization. So far, the states, which have successfully privatized are: *Johore* (under Syarikat Air Johore Holdings Sdn Bhd), *Kelantan* (under Air Kelantan Sdn Bhd which is jointly owned by Thames Water and Kelantan Government), *Trengganu* (under Syarikat Air Trengganu Sdn Bhd) and *LAKU Management Sdn Bhd* (only for Miri, Bintulu and Limbang in Sarawak).

Meanwhile state like *Penang* (under Perbadanan Berkalan Air Pulau Pinang Sdn Bhd) is still in the corporatization stage whereby the State government owns 100% of the organization. Other state like *Negeri Sembilan* have tried to corporatize but failed and have since then reverted back to the state government. (Seah 2000, 9)

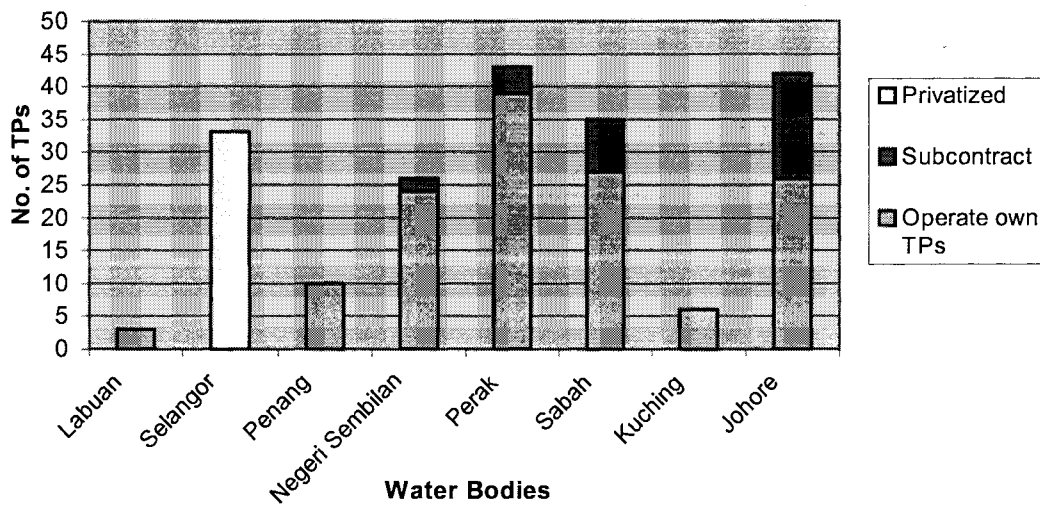
3.7 Local Instances

3.7.1 Structure of Water treatment plant operation

Many of the water treatment plant operators in the country, only eight are either 100% privatized or partially privatized or wholly owned and operated by the water supply bodies themselves.

Here below are the methods, which the treatment plants of the eight water bodies are operated. (Seah 2000, 10)

CHART 2. Operations carried out by the treatment plants (TP) operators in the different water bodies (Seah 2000, 10)



The activities of the treatment plants operators are very simple and at the same time, lucrative. Operators are not involved in the repairs and upgrading neither of pipelines nor in the building of new pipelines. They are in the treatment of water, which they sourced from the rivers. Water from the river is then treated and distributed via a main pipeline (trunk pipe) to the State Water board/ dept., which in turn distributes it to the customers within the state only. Water is allowed to transfer from one state to another unless carried out by the Federal Government. (Seah 2000, 10)

3.7.2 Non-Government Bodies Related to Water Supply

Malaysian Water Association (MWA). MWA was formed in 1988 and has 641 members in a year 2001 (See Appendix 6). The main objective of MWA is to promote synergy and enhance knowledge and good practice within the Malaysia Water and Wastewater Industries to enable them to achieve their corporate goals and hence contributing effectively towards creating national competitiveness and success. (Malaysia water industry guide 2001, 41)

Association of Consulting Engineers (ACEM). The association is made up of consulting engineering firms. While the mainstay of the association is to promote the

interests of consulting engineers, it has also been active in dissemination of knowledge through seminars and training courses. (Malaysia water industry guide 2001, 41)

Institution of Engineers Malaysia (IEM). The IEM is the oldest engineering organization formed to provide a common forum for all engineers in the country. Smaller divisions exist within the IEM, one of which is the Water Resources Technical Division. Seminars and technical visits are organized by the Division to promote a better understanding of water resources among engineers. (Malaysia water industry guide 2001, 41)

Consultants. A consultant engineer is a person possessing the necessary qualification to practice one or more branches of engineering who devotes himself to advising the public on engineering works. A consultant engineer is an independent professional engineer who performs services for clients on a fee basis. He acts in all engineering matters as a professional advisor to his clients whose interests he watches with skill and diligence. The remuneration for his services is solely the fees paid to him by his client. A consultant firm must be registered as a corporate body with the Board of Engineers Malaysia. (Malaysia water industry guide 2001, 42)

Contractors. Contractors play an important role in the water supply industry. State water supply authorities employ the services of contractors to a large extent in construction, operation, maintenance and other specialist services not available in-house. (Malaysia water industry guide 2001, 42)

Suppliers. Manufacturers and Suppliers in the water industry play an important role in supplying chemicals, pipes and fittings, equipment, meters, telemetry facilities etc, all of which are vital for proper water supply operation and maintenance. In line with the Malaysia Incorporated Concept, some of the manufacturers are also incorporated in committees set up by SIRIM Bhd to draft the specifications and standards for materials manufactured in Malaysia for use in the water industry both locally and for export. (Malaysia water industry guide 2001, 42)

Plumbers. State Water Supply Authorities are empowered to appoint and issue licenses to plumbers who are then referred to as registered plumbers. This is mainly to safeguard the water supply system against water contamination and damage by unqualified plumbers. These plumbers can only work in the states in which they are registered. (Malaysia water industry guide 2001, 42)

3.8 Water Resources

Water resources are state matter and the policies on its management, regulation and development are under the jurisdiction of the states. Water resources development and management in Malaysia had traditionally been carried out by various Federal and State agencies, mainly for water supply, irrigation and hydropower generation.

3.8.1 Water Resources and Supply

In Malaysia, the average annual rainfall is 2400 mm for Peninsular Malaysia, 2360 mm for Sabah and 3830 mm for Sarawak. This makes up to about 990 billion m³, out of which 566 billion m³ appears as surface runoff, 64 billion m³ goes to groundwater recharge and the rest returns to atmosphere as evapotranspiration. Of the total 566 billion m³ of surface runoff, 147 billion m³ is found in Peninsular Malaysia, 113 billion m³ in Sabah and 306 billion m³ in Sarawak (National Water Resources Study 1982, 4).

From Study investigations, although groundwater supplies are relatively small in comparison to the quantum of water taken from surface sources, they are still quite significant in terms of yield and availability to make reasonable contribution to the problem of meeting future water demands for public water supplies. Existing and potential groundwater sources should be conserved and protected for use especially in times of need during water crises.

The estimated annual aggregate for domestic, industrial and irrigation water demand in 1999 was about 16.3 billion m³. However, water stresses are still experienced in some of the densely populated and economically developed areas. This is mostly

due to the uneven temporal and spatial distribution of rainfall, which resulted in fluctuating river flows over a wide range. (Malaysia water industry guide 2001, 47)

3.8.2 Present Water Use

Consumptive water use is largely for irrigation and domestic and industrial water supply and to a minor extent for aquaculture and mining. Hydropower is generated utilizing potential energy of water. In stream water uses are navigation and fish rearing.

Streams or rivers with or without impounding reservoirs contribute about 98 percent raw water for water supply in Malaysia. In 1999, the water supply capacity in Malaysia was approximately 10.729 million liters per day (MLD) as compared to the demand of about 9.028 MLD (See appendix 3). 98 percent of the urban population and 90 percent of the rural population were served with pipe water supply and the national overall coverage was 93 percent (See appendix 5).

Hydropower constitutes part of the total energy currently generated. The demand of power has been increasing rapidly over the past years. Potential hydropower projects, which could provide additional benefits such as augmenting low flows in rivers and flood mitigation, had also been identified.

River flow regimes are irregular and safe yield from surface water necessitates the construction of storage facilities. As such, the construction of storage schemes to regulate the fluctuating flows in rivers has long been practiced for the purpose of irrigation, water supply, flood mitigation and hydropower development. Currently there are 53 single purpose and 16 multi-purpose dams (excluding saddle dams) with a total storage capacity of about 29.863 billion m³ in Malaysia. The distribution of the dams and the purposes are as shown in appendix 1. (Malaysia water industry guide 2001, 47)

3.8.3 Water Demand

Annual domestic and industrial water demand in 2000 was 3.8 billion m³. In the year 1998 the demand was 3.1 billion m³. Irrigation areas in Malaysia in 2000 were 535.000 ha resulting the irrigation water demand to be 10.4 billion m³. The aggregate total water demand in year 2000 was 14.2 billion m³, which represents only 2.5 percent of the estimated annual surface runoff of 566 billion m³.

Because rainfall is unevenly distributed and water supplies for domestic and industrial purposes are designed for a reliability to meet the drought severity that occurs once in 50 years, a few states have begun to find that their water resources are not able to meet their mounting water demand. To overcome water stress in the states, inter-state or inter-basin water transfers will soon become an increasingly common feature of water resources development in the future. (Malaysia water industry guide 2001, 50)

3.8.4 Water Resources Planning and Development

Malaysia is undergoing a very rapid pace of socioeconomic and industrial development, progressing towards the attainment of an industrialized nation status under Vision 2020. To support this development, water resources need to be identified, planned, developed and managed to meet their increasing demand. The prospect of increased water stress in high growth areas and abundant water resources, which are unexploited in low growth areas, highlights the need for an overall national perspective to ensure efficient development of water resources. In line with this, the Government recognizes the need to carry out forward planning for water resources development and conservation in the country.

The main emerging principle is to develop an effective policy and delivery environment, such that water resources development and management can be undertaken in a holistic, determined and sustained manner to meet national development goals and protect the environment. The National Resources Master Plan with a planning horizon of 50 years (2000-2050) is therefore fundamental to support such development. (P.F. Low, interview 07.08.2001)

4 Corporate introduction and Xpipe in Malaysia

4.1 Introduction

Tekla Corporation is the leading supplier of model-based software in the world. Three of Tekla's business areas operate in the international arena and are responsible both for product development and selling the software and related services.

Building and Construction develops applications for the building industry. Tekla Xsteel is the world's leading model-based software for steel structure detailing, with thousands of users in more than 50 countries.

Energy Distribution develops solutions to enhance the business and operational efficiency of energy distribution network utilities. More than 70 electricity distribution companies use Tekla Xpower, worldwide.

Public Infra develops applications for municipal information management. The product family includes Tekla Xcity and Tekla Xpipe. Tekla develops the information management technology; all products are easily adapted for the international market.

The fourth business area, Projects, mainly focuses on the Finnish market, undertaking customer-specific development projects, related to Tekla's technological core competencies. It also plays an important role in product development, with potential likely candidates for the Tekla X product family often resulting from projects implemented for pilot customers.

With headquarters in Finland, Tekla has subsidiaries in Sweden, Norway, Germany, the UK, France, Malaysia, and the United States. The company has also committed to establishing a subsidiary in Brazil. In addition, Tekla has representative offices in China, Japan, and Dubai, as well as a worldwide partner network.

Net sales of the Tekla Group increased by 46.3% for 2000 from the previous year, rising to 26.47 million euros. International operations accounted for 70% of net sales. Tekla currently employs around 300 people. Tekla Corporation has been quoted on the main list of the Helsinki Stock Exchanges since May 2000. (Tekla WebPages 2001)

4.1.1 Building and Construction

The worldwide leader in structural engineering software Building and Construction develops integrated model based applications and services for the construction industry. The Tekla software provides the customers with a competitive edge through real time information exchanges any time and anywhere. The multi-user environment of the structural engineering products allows large teams of detailers and designers to work on the same model, regardless of location and time. Due to the global, professional partner network, customer support is always near to every user - in his/her own language. Building and Construction doubled its investment in product development in 2000, and is expanding the product palette from steel structure to multi material modeling. (Tekla WebPages 2001)

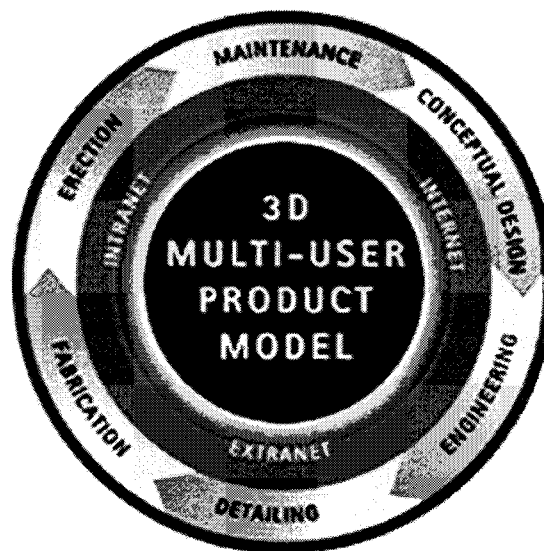
Tekla Xsteel - The leading model based software for steel structure detailing: already over 3000 users in over 50 countries. With 3D Product Modeling, Object-based Technology, Project Collaboration, Interoperability and other features Xsteel represent the latest technology and know-how in Cad software industry.

Xsteel automatically generates all drawings, perspective views and material take-off reports required for the whole project or any part of it - all in a form customized to meet the user's specific standards. After any revisions or modifications to the model, Xsteel automatically revises all related drawings and reports to ensure total consistency and accuracy.

Xsteel's multi-user mode allows several users to access simultaneously the same single Product Model of the Building. This feature makes Project collaboration finally possible in real projects. In big projects particularly, this powerful feature can produce huge gains in terms of teamwork effectiveness and calendar timesaving.

Xsteel is based on the concept of Product Modeling. A 3D Product Model is a digital representation, in the computer's memory, of the real world structures and all the relevant components, parts and equipment within it. In addition to the geometrical information, the Xsteel Product Model contains information that can be used for analysis, design, detailing, fabrication, assembly, transportation and erection. All the information is contained in a single 3D Product Model of the Structures. (Tekla WebPages 2001)

PICTURE 1 3D multi-user product model



4.1.2 Energy distribution

Tekla Xpower - Visualizing for decisions Energy Distribution enhances the business and operational efficiency of distribution network utilities by providing advanced solutions for daily decision-making. The Tekla Xpower system, used by many top electricity distribution companies in Europe, has been specifically developed to fulfill customers' asset management needs.

Xpower spans the entire range of business activities carried out by electricity companies - from network planning, calculations and operations management to flexible network maintenance. The applications provide users with visualized network information and analysis, and thus enable fast and reliable decision-making. Xpower

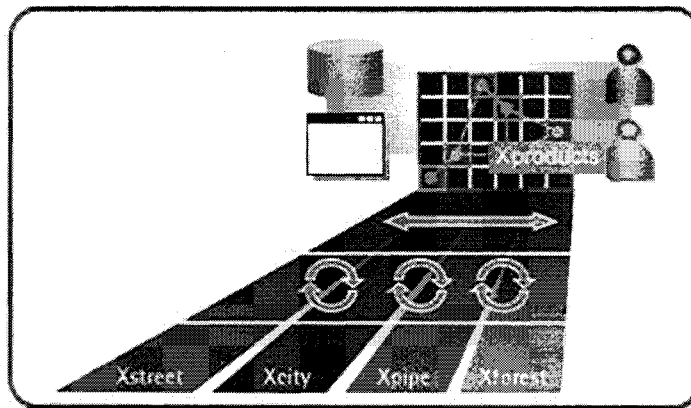
clearly exceeds GIS functionality. Xpower has proven its competitive nature by gaining market leadership in the challenging environment of the Nordic countries, where high standards are set both by electricity network technology and the advanced, deregulated energy markets. More than 70 companies currently use Xpower systems worldwide. (Tekla WebPages 2001)

4.1.3 Public Infra

Public Infra helps local authorities to effectively manage and utilize infrastructure information and provide citizens with services that both save time and enhance their quality of life. The applications developed by this business area provide a platform for improving customer operations and internal efficiency, and also facilitate the creation of e-services for local residents. This municipal information management is based on the Infrastructure Resource Management concept, developed by Tekla - a next generation concept that effectively combines spatial, population and infrastructure data into one database. The creation of this "community model" enables the development of improved applications for core functions, as well as more versatile information services catering to the differing needs of a broad user base.

Flexibility is fundamental to Tekla Infrastructure Resource Management applications, both in terms of functionality and the variety of terminal types through which the application can be accessed, such as desktop PCs, the web, WAP platforms as well as mobile phones and other devices. Tekla municipal information management systems are already market leaders in Finland. Tekla's unique information management technology means that these systems are also easily adapted for the international market. The Public Infra product family includes Xcity, Xpipe and Xstreet. (Tekla WebPages 2001)

PICTURE 2 Vision of the possibilities for integration of the X-Product family



4.1.4 Projects

Tekla's purpose is to provide its customers with increased efficiency, productivity and competitiveness through superior customized information systems. Tekla offers for its customer's top-level consultancy, information system development and long-term commitment.

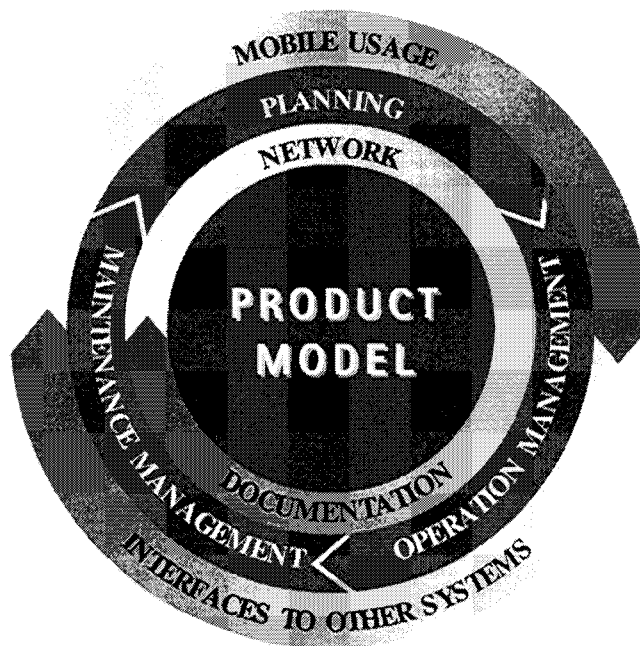
Tekla's assignments cover the following phases in the life cycle of the software development project: technology evaluations and consultancy customer and project requirements the specification, design and production of software systems implementation, training and customer support maintenance and further development. The areas where Tekla is dealing are Forestry, Infocom, Web & Wireless and Defense.

Tekla's key customers in Project department are the Finnish Defense Forces, Stora Enso Oyj, Nokia Oyj, Sonera Oyj, Telecommunication Administration Centre, Forestry Development Tapio, and Fingrid Oyj. The company also participates in several international development projects. (Tekla WebPages 2001)

4.2 Tekla Xpipe – what is it?

Tekla Xpipe is the integrated *Network Information Management Solution (NIMS)* for cost-effective management of assets and resources in Water and sewerage utilities. Tekla Xpipe provides water and sewerage utilities added value and strategic competitive advantage by optimizing the operations of networks, increasing the efficiency in working processes and improving the customer service and the distribution quality. It's advanced modeling technology and integrated application support the utility's business processes throughout the whole network cycle: Network documentation, network planning, network operation management and maintenance management. (Xpipe Product Overview 2001, 3)

PICTURE 3 Tekla Xpipe supports network management processes



Key features

Tekla Xpipe is based on common databases (Oracle, Ingres) and platforms (WindowsNT, Unix). That enables utilities to take advantage of their existing IT investments and know-how. The water and sewerage network data is stored with an enhanced product modeling technology in an open database. Due to the ready made

and yet customizable Tekla Xpipe product models the utility is able to implement a network information management solution faster and more efficiently. It provides the following key features: Multi-user support, 4D database, background maps and built-in network topology and dynamic coloring. (Xpipe Product Overview 2001, 5)

Multi-user support

Several users can simultaneously access the network information in the product model through various internal or external applications. With this feature users throughout the organization are able to view, plan and operate the network without locking the database and the data in it. This multi-user feature is a basic requirement for spreading out the system through out the water utility, and by spreading the network information system through out all activities; one can achieve maximum cost savings. The database management can master several planning sessions even though they are related to the same network area. (Xpipe Product Overview 2001, 5)

4D database

The 4D database masters both the geographical coordinates (x, y, z) and the time. The time management in the database means Tekla Xpipe product model can handle the past, current and future status of the distribution network. The feature is useful for example in the maintenance management. The historical data about network condition and water distribution is also very valuable in customer service situations. (Xpipe Product Overview 2001, 5)

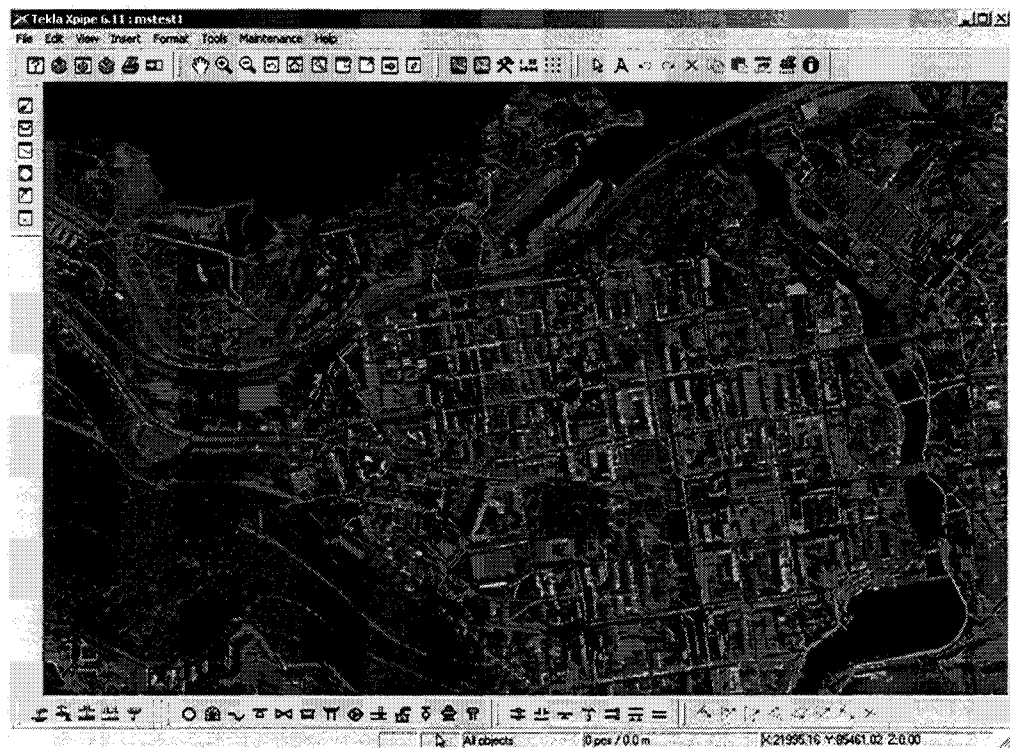
Background maps

The network information is presented on top of background maps, which can be based on raster, vector or hybrid maps. Satellite and aerial photos are also widely used as background maps in the Tekla Xpipe system.

It is possible to define the automatic change of a background map based on the used scale. This means that maps change automatically, when the user zooms in/out. Maps can also be automatically pre selected depending on your working task. This

means that the user directly get the map information needs for his current working task, for example maintenance planning. This feature, with automatically selection of background maps depending on your current task and your zoom level speeds up the working. (Xpipe Product Overview 2001, 6)

PICTURE 4 an example of background maps



Built-in network topology

The built-in network topology with the dynamic coloring provides the personnel a quick, clear and reliable tool to check flow directions, affects of closing valves and a method to optimize the closing of water distribution during maintenance works. The network topology also tells how the network is connected and where the water is federates into the pipes. To built-in network topology enables tracking of customers via the network. This feature is important for accurate pre-noticing of customers about planned distribution interruptions due maintenance works.

The built-in network topology also supports and speeds up customer service, at the counter or in the phone, due to the possibility to fast find the customers connecting

point to the network, and find out information about the distribution network. Information available is distribution situation, network condition, planned or on-going maintenance works etc.

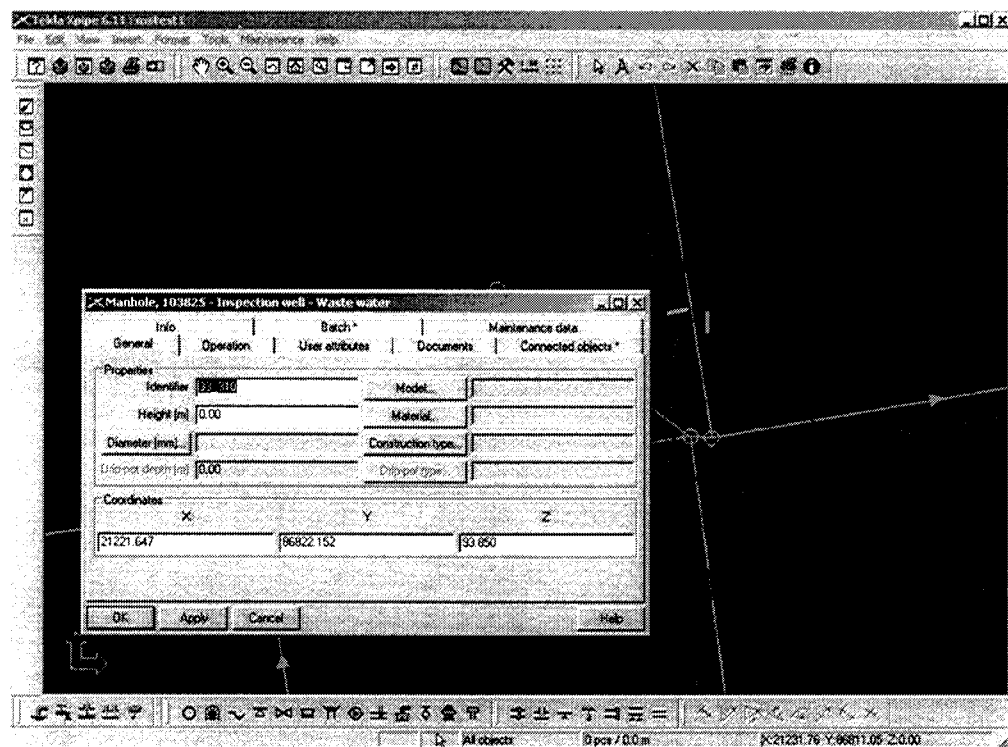
Adding remote controlled equipments or sensors to the Tekla Xpipe system turns the built-in topology into a real-time state. The states of valves and water flow, and thereby also the topology, follows automatically in real time the indications and values fed by the remote controlled or sensed information. The real time network situation and network topology is an excellent indicator for leakage and damage detection. The built-in network topology is automatically created, when entering data to the system, so no special actions are required by the user to establish the network topology. (Xpipe Product Overview 2001, 7)

Network documentation

Network documentation is the basic part in Tekla Xpipe for initializing and maintaining the water distribution, sewerage and drainage network data. Customer specific network structures are easy to configure and manage in the ready-made product model. With Tekla Xpipe it is necessary to store the network data only once. Due to the advanced data management, all data is available in various presentations, e.g. valves data can be viewed and edited in different scales.

Furthermore, the documented data can be used throughout the whole network life cycle: planning, construction, operation and maintenance. For example, the following network presentations are possible: Different network maps (distribution, sewerage, drainage) in diverse scales, location maps in diverse scales, maintenance and fault maps, sections of pipes. Network component related data is entered, edited and stored in the database by digitizing and using dialogues, which appear by clicking and object symbol in the graphical network presentation. (Xpipe Product Overview 2001,8)

PICTURE 5 an example of a properties dialogue

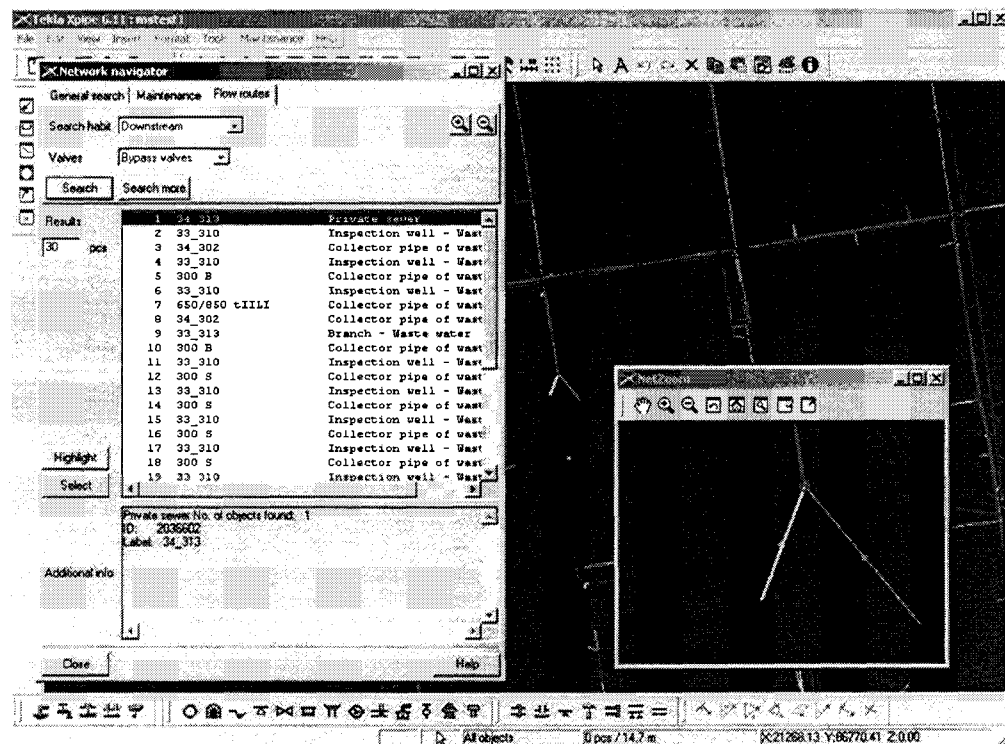


Simulation of distribution interruptions and flow routes

The application can be used for planning distribution interruptions for maintenance interruptions and abnormal situations by recording the appropriate actions into the database. During the planning process alternative feedings can be simulated and customers affected automatically listed.

The simulation state is used for testing out the impact of feeding state changes. Various emergency plans can be simulated beforehand to make the restoration time shorter, and the utility can optimize planned interruptions and inform its customers in advance. Also flow in the sewerage can be traced up streams and down streams. Situations like oil spill etc. can be traced. (Xpipe Product Overview 2001, 8)

PICTURE 6 Water flow routes with Xpipe



Maintenance

The maintenance of the existing network is essential in order to provide high distribution quality at moderate prices. Tekla Xpipe assists utilities in managing their maintenance cost-efficiently and to maximize network operability by enabling well-timed and well-targeted inspection programs and providing more efficient ways to collect condition data.

According to the customer's maintenance policy, different inspection programs can be implemented based on time and age, condition, location, combination of the previous alternatives. Simultaneously with the inspections all missing or changed device data can be stored in the database, thus completing the network documentation. (Xpipe Product Overview 2001, 8)

The Xpipe Maintenance application provides graphical tools for managing: Inspection orders and plans, work orders, condition data, historical data and maintenance costs. The planning of inspection orders can be adjusted to meet the utility's maintenance policy. The condition data and tasks are defined at the office and are then either printed out as work orders, or transferred to a field computer by using the Mobile MMS application. (Xpipe Product Overview 2001, 10)

The Mobile Maintenance application installed in a field computer displays inspection instructions and provides a tool for recording the condition data, as well as missing components and attributes. Later the collected data is transferred to the central database for further analysis and maintenance task planning. With this application inspection are more straightforward and efficient compared to the traditional maintenance, which requires masses of plotted printouts and forms for ticking the collected condition data. It also reduces redundant administrative work and eliminates extra data entering in the office. (Xpipe Product Overview 2001, 10)

Reports

Tekla Xpipe provides comprehensive reporting and analyzing possibilities. The system includes ready-made reports for network properties, maintenance works, condition data and costs. The reported issues are for example: Monthly maintained amount of pipelines per category, total costs for planned maintenance activities per month, the length of pipes in poor condition and number of reported leaks during the last month.

The reports help you to manage and follow up activities related to the network. The reports are also an excellent support for budgeting. The reports are presented in text or tabular format. All data in the database is available for reports in standard MS Office tools. (Xpipe Product Overview 2001, 13)

Xpipe Web

It is important to implement the network information system through out the whole water utility in order to achieve full benefits from the system, benefit from cost savings, effective the workflow and remove unnecessary work steps. Of course different officers needs different kind of information. Tekla Xpipe includes a Web-based client for Intranet use, i.e. to use inside the water utility providing an easy and fast access to the data. Utilizing the Web –technology makes it fast and cost effective to expand the system on the corporate base to all those, who are connected to the corporate network. (Xpipe Product Overview 2001, 15)

Through Tekla Xpipe Web one can browse all the data managed by the Tekla Xpipe Network information system, for example, browsing network maps and component data, maintenance works, easy and fast to use by the officers at customer service counters and basic customer data. Tekla Xpipe Web has high-level data security, both data access and client functionality are based on the user profile. This means that every user must log on the system, and depending on his user profile he get access to certain data and certain functions in the system. (Xpipe Product Overview 2001, 15)

4.2 Survey study for Tekla Xpipe in Malaysia

The corporate management does international decisions. Their plans and purposes are tried to follow as well as possible. In this stage researcher can also use its own experience in planning and strategic thinking. In this thesis the writer had two possible approaches to follow when researching Malaysian water industry. These were qualitative and quantitative approaches. Studying the survey and analyzing its results could have done quantitative approach. In this approach, the writer could have study the entire water industry and find facts about the industry. In qualitative approach, the information is collected more practically by interviewing the people working in the industry. The problem in qualitative approach is normally, how to measure the results. This can be done by nominal or ordinal ways. (van Maanen, 1979; Bryman, 1988; Marshall & Rossmann, 1989).

By using concise materials is closely related to field- and case studies. (Kaplan, 1986). The goal is to get deeper and more overall understanding about the topic studied than in quantitative approach, where you have plenty of different material to go through to get an overall idea. The idea in using qualitative method is to get closer relation between the material and the topic writer is surveying. The problem is to do general rules by the results and therefore these rules are not created in this thesis. (Hägg & Hedlund, 1979; Mäkinen, 1980; Yin 1984; McKinnon, 1988)

When writer started to write constructive survey based on the reasons mentioned above, first can be stated that constructive survey can include both quantitative and qualitative material. Constructive survey is typically based on case studies and therefore material is concise. It is important to understand that the definition "case survey" can be descriptive (analysing, describing) or normative (modelling, recommending) survey. The constructive survey is especially the normative survey.

According to Neilimo & Näsi (1980) definition, the constructive survey

- Produces the innovative and theoretically proved solution for practical problem
- The results are proved to be practically used
- The result is proved to be useful in another problem

With these definitions the constructive survey differs significantly from following surveys:

- *Analytical model-building*, where it is unclear how it can be used in practice
- *Theoretical problem-solving function*, which is produced by using theoretical approach, but only to serve as disposable solution and,
- *Consulting*, where the solution for practical problem is created, but without the theoretical reasons and prove.

Constructive survey tries to connect these three problem-solving models. According to Susman & Evered (1978) the goal is to be problem-solving normative survey, where the problem is solved innovative way, empirical solution, which is proved by testing it in practice and to survey the size of the solution.

Research questions and problems in this thesis are discussed by using qualitative method. Qualitative method is forming a theory and analyzing the results. This survey is an analysis of qualitative material, which is collected with interviews. This is general way to gather information like Holt-Jensen (1988, 129) has explained.

More detailed statistical methods are not reasonable to use in this context since the results wanted from the interview questions are needed to explain certain topics in this thesis, not try to connect the results to each other. Because of this, the qualitative research method is clear enough for the purpose of this study. Explanatory and understandable hermeneutical method gives a better understanding of company's goals and methods of doing business than complicate quantitative analysis. People do the decisions in the company. Their decision will be analyzed in an understandable way. From their action are tried to find out similarities and build models. The results are compared to previously explained context and writers own experience. With these results the thesis tries to describe how Tekla should differentiate and compete in Malaysian market with Xpipe software.

The empirical material consists of three parts:

1. Discussions with company experts
2. Interviews with the consultants and engineers working in the Malaysian water industry
3. Statistical information of the Malaysian water situation.

The writer interviewed in year 2001 the company experts in Finland and Malaysia while working with them in Tekla. The local consultants and engineers were interviewed during the summer 2001 in Malaysia. The interviews are discussion types, where interaction was essential part of the meetings. This made the free atmosphere possible and opinions were mentioned freely. Based on the discussions and own experience, writer has done the recommendations for the market entry.

The purpose of the interviews were to find out what were the peoples opinions of the Tekla Xpipe products possibilities to succeed in Malaysia, how to differentiate and to gather general information about the competition in Malaysian water markets. From the company experts the writer got information how the Xpipe differs between Malaysia and Finland, how customer service are done in Malaysia and what is

helpdesk. Training, technical requirements and security issues are also discussed based on expert's interviews.

The following questions were asked from the Tekla's experts:

1. How long is the training period and are there any training offered after the basic training?
2. Where the training is organized and offered?
3. What is the purpose of Help Desk and how it works?
4. How the customer service works between Finland and Malaysia? How the services are dealt when the customer needs help from Malaysia?
5. How the security issues are handled?

The following questions were asked from the Malaysian consultants:

1. In what condition are the water pipes and sewing systems in Malaysia in general?
2. Can you explain the structure of the water utility sector? Some of the water bodies are under Federal authorities and some Government owned.
3. How would you see the water markets in Malaysia?
4. There have been some discussions that the Malaysian water sector will be privatized. How would you see the water markets in Malaysia when you think about the future?
5. Are there any third party involved in water business for example outside consultants who the water bodies report their information or who deals with the maps?
6. How do the local water bodies store their data, for example information about the customers or pipe network? What about any records of how the water system has been controlled?
7. What kind of methods the water bodies use for planning, construction and keeping their information up-to-date?
8. What is your view on Xpipe?
9. What are the areas Xpipe should improve further?
10. What is best strategy to promote and market Xpipe?
11. What is the range of price level should Xpipe label?
12. Are there some legal issues that should be concerned about in the field of Xpipe?
13. Who currently compete in this market with Tekla?
14. Who could be the most potential customers for Xpipe?
15. What kind of customer service would be needed?
16. Who would be the potential local customers for Xpipe?

The following questions were asked from the Malaysian engineers:

1. What kind of organization is the JKR and what is the structure?
2. How many employees and how the people are divided to the different departments?
3. In what condition are the water pipes and sewing systems in Malaysia in general? And in Selangor?
4. Can you explain the structure of the water utility sector? Federal Government vs. State Government owned.
5. Why the Territory of Labuan is a special case?
6. How would you see the water markets in Malaysia?
7. There have been some discussions that the Malaysian water sector will be privatized. How would you see the water markets in Malaysia when you think about the future?
8. Are there any third party involved in water business for example outside consultants who the water bodies report their information or who deals with the maps?
9. How do the local water bodies store their data, for example information about the customers or pipe network?
10. What about any records of how the water system has been controlled?
11. What kind of methods the water bodies use for planning, construction and keeping their information up-to-date?
12. How do you handle the invoicing in Selangor? How you collect the money from the customers?
13. Do you have any information about how much water is supplied yearly?
14. What are the total costs for the JKR in yearly basis in water branch?
15. What is your view on Xpipe?
16. What is best strategy to promote and market Xpipe?
17. What is the range of price level should Xpipe label?
18. Are there some legal issues that should be concerned about in the field of Xpipe?
19. Who currently compete in this market with Tekla?
20. Who could be the most potential customers for Xpipe?
21. What kind of customer service would be needed?
22. Who would be the potential local customers for Xpipe?

The discussions with the people and results from the interviews are analyzed in different themes, which will be shown in next chapter.

The interview-questions for the consultants and engineers were sent earlier via e-mail so they could be better prepared for the actual interview. It was relatively difficult to find local Malaysian people for the interview, since in Malaysian culture unknown person is treated as a not trusted person when he/she writes something down while interviewing people. They are more open, once the papers are put aside and they can be sure that the discussions are conversational. If writer tried to have an

appointment as a student, he had difficulties to meet experts in water industry, but when someone from Tekla's office called them and said writer is working for Tekla and writing his thesis, everything went fine and appointment was organized easily.

There are approximately 200 hundred engineers working in water industry in Malaysia. There are numbers of consultants working in water industry too, and their background is similar than actual engineers so it is hard to clarify whether the number 200 includes also the consultants. The research questions were sent for 40 of them but only ten replied. Most of the questions were not completed in a way that writer could use them but the people who were ready to meet him (four people) gave valuable information about the Malaysian water situation.

The Malaysian water industry section has been written by using the qualitative survey. The writer gathered information by interviewing with people but also spent time in government libraries studying the statistical information related to water industry. The following section of the thesis will describe the results based on the questions showed earlier and discussions with different participants related to Xpipe and Malaysian water industry. The following sub-categories are dealing with differentiation, competition, service and security. After described these topics, the recommendations for Xpipe market entry is introduced based on the writers experience and results gathered from different sources.

4.3 Development

How to differentiate?

To be able to succeed in competition, Tekla have to be able to build corporate image that reflects reliability, professionalism and trust. By building mutual rapport with the customers and providing personalized services Tekla will be able to create more value to their customers than the competitors. All this requires extensive marketing activities and personal commitment from all the participants to achieve these goals. In all operations Tekla are strongly focusing on high quality and customer service. Tekla is continually seeking greater challenges with Xpipe and pursuing high performance level.

Tekla owns the GIS software, which it has developed and for that reason is not dependent on the other companies at their pricing. The competitors are more dependent on partners in their pricing policy, since they use different partners in different product development phase. Due to this the total price may change (rise) a lot from the price offered at the beginning.

Xpipe is used only for managing the water and wastewater utilities when the competitors systems may be the same used for manage for example energy, steel or electricity utilities, but with different variations. The programs cannot work very effectively, when they are not planned for special purpose. When the competitors program works at the same time for different purposes it is not very effective and there will always be problems with updating the program.

Tekla's products are always planned for a certain specified purpose. Xpipe is for the water and wastewater utilities, Xcity is for the city planning; Xpower is for the electric providers and so on. This makes the programs more users friendly because, now you can choose only that management program what you really need and which is developed especially for your purpose.

Competitors management solution software is often built up so that they use some widely used programs for example AutoCAD as their platform. Often there is also a third part, which creates application for the program; for example water or electricity system.

Because the same platform is used in other applications too, the program editing is difficult later when all users with different applications want to develop that same platform. When a new AutoCAD version is launched, Tekla's competitors need to update all their software again since they are relying on that program. In practice, it means that every time when new AutoCAD version is launched they need to update their current versions to work like new AutoCAD version.

Tekla X-family products provides a complete package, which includes all the necessary parts needed for managing the software, and when the company updates the software there will be no hassle in either Tekla's or customer side.

Once the customer has bought the first product from Tekla, for example Xcity system, other software (Xpipe) packages can be easily installed to work together at the same environment.

In the network information management market, Tekla is one of the leading companies even though products are more expensive than the competitors has. In a long run, customer will save expenses when purchasing Tekla product, since they avoid using the third party's and product development is much more easier than if they choose competitors product. (T. Ray, interview 25.04.2001)

"Tekla products are like Mercedes in car markets and it does not want to sell any Nissan Micra's". (T.Ray, interview 25.04.2001)

Competition

One very challenging task for the Xpipe is, how to convince the customer that the program is better than competitors. ESRI, who is the biggest competitor in Malaysia, competes against Tekla's Xpipe with his or her own program called ArcView. The ArcView is based on the AutoCAD methodology, which is very highly used in Malaysia. The story behind all is that the Malaysians started to copy the AutoCAD program. Piracy is very common in overall Asia where all kinds of CD's are copied and sold out for just a few Malaysian Ringits where the original version costs thousands of Ringits. But instead of starting to accuse the people for using pirate versions, the AutoCAD company let the people use the pirate programs and wanted the people learn how to use the program.

The both parts were happy; the Malaysians that they could learn the worldwide known program for cheap price and for the universities it was even offered free of charge. The AutoCAD software producers were happy since they got the locals hooked for the program. For this reason it is hard to convince people that the Tekla's

own GIS software is better than the already used AutoCAD. If the customer wants to switch to the Tekla system, they need to do lot of adaptation. If one department out of ten from the state owned bureau switch to the Tekla system the other nine need to follow, since it doesn't make sense to have two different systems inside the same bureau.

ESRI has done a great deal in taking care of the local authorities. In every state there are about 10 to 15 director with different task and focuses. ESRI sales people have contacted these authorities directly and sold their product well after convincing them. They have a competitive advantage while their product ArcView is based on the AutoCAD technology, which is well known around the country for the reason earlier mentioned. Their price is also much lower than the Xpipe is and the Xpipe (based on GIS technology) is not really so much different than the ArcView (based on the AutoCAD technology). (A. Mohd, interview 30.07.2001 & ESRI Webpages)

Xpipe differences between Malaysia and Finland

Basically the product is the same worldwide. The format and how the product operates are similar. The data stored inside the program differs because of the different ways of managing water utilities and different ways of storing the data. In Finland all the documents are stored nowadays to the computer database, but in Malaysia the data is mostly stored to the manual files and folders. (P. Kokkonen, interview 26.06.2001; E. Mäkinen, interview 27.04.2001)

Potential customers for Xpipe

Based on the conversations with local water bodies and consultants the Malaysian Water Association, Water Supply Branch of Public Works Department Malaysia and Mr. A. Mohd, the states of Selangor, Perak, Pahang and Johor would be the most potential customer candidates, since they are the states that have been planning to privatize.

Customer Service in Malaysia

The customer service department is established in 1999. The department is responsible for training, conversion, installation, and efficient customer support. After the customer has bought Tekla product, the relationship between the customer and Tekla will continue. The service department will train the new users to use Xpipe. The training includes some test projects and implementation as learning tools. Tekla Helpdesk, where client and trainer communicate via e-mail or telephone in a certain date and time, provides additional help when learning the new system. The service department takes care also of development- and improvement planning.

One of the advantages of Xpipe is that when you update the software; all the old information remains the same in a database for years. The so-called conversion development means that the data is edited and brought to the Xpipe database from the customer's own data files. Moreover, the program is not dependent on the background map.

Before taking the program under operation, it will be checked once more even though it has been checked already in production assembly. The reason for this is simple that Tekla wants to make sure no mistakes occur.

The communication is essential part of the Service Departments work. The department visits potential customers showing them demo version of the Xpipe and try to convince them about the benefits that Tekla products can offer for the customer. (P. Kokkonen, interview 26.06.2001)

Helpdesk

Purpose and features - The helpdesk is established to support those customers who have the maintenance contract with Tekla. For the maintenance operation Tekla service department has recruited the professional staff, which have background from the application field and skills to work in a technical environment.

The Helpdesk is a 24 hour “self help forum” so the customer can contact Tekla always when any problems occur. Tekla is required to response for the questions asked about Xpipe and they are required to advise the customer to find a solution for the problem as fast as possible. You may contact the Helpdesk via e-mail, intranet, phone and fax.

Tekla saves all the maintenance requests to the SAP-system so the historical data of the customer are always up-to-date in Tekla office. Due to the maintenance contract, Tekla is responsible for find a way to solve the occurring problems. Also the possible mistakes in manuals need to be fixed. If it is obvious that the mistake force to put the work on hold, the company is required to start the reparations within five days and continue to repair the problem until fixed that. (E. Mäkinen, interview 02.08.2001)

Helpdesk between the Malaysian and Finnish offices - Tekla has local helpdesk service called first line in every country, which serves local customers. Tekla Espoo has a function as a second line help desk i.e. they support the local Tekla office or partner that deliver the solutions to the local customers. Through the SAP system the local customers worldwide put their maintenance requests into the same global database. From there Tekla can see all the requests worldwide and know which office should respond to the requests.

Helpdesk stands for helping customer with the problems they have in using Tekla’s product. In Malaysia the support is based on the people in the office who are helping the customer in their problems. It has been noticed that is not wise to help Malaysian customer from the Finland when you have office at present where your customer is located. If some problems occur that the Malaysian office cannot solve straightaway they communicates with the head office in Finland to solve the problem. (E. Mäkinen, interview 02.08.2001)

Training for Xpipe

After customer has bought the product its staff has to be trained for using the new program. By doing so Tekla wants to guarantee that new customer learns to use the program correctly. Normally the training is divided to basic training days and to advance training days.

The Finnish Xpipe seller A. Kivelä says that at the beginning it is convenient to have three to four days' basic practice with the customer to get them familiar with the program. The next two weeks after this the customer can study the program without supervision and afterwards there will be some extra training offered. This is proved to be a good method since after the two weeks client has more detailed questions to ask and they can be easier advised. If client feels that more advisory is needed it can be arranged for example in next two weeks. The client support is excluded from the price of the product. For practical reasons client normally buys the client support since without proper training it is hard to start using the Xpipe. The client pays license fee, which is 15% of the total price yearly. (A. Kivelä, interview 27.04)

The length of the training session for the new customers depends on the modules the customer has bought. The Xpipe has been divided into different modules and based on how many modules you have bought, you will get training. The training has been categorized as follows using the skills and size of the organization as the measurement:

- The main-user training *2 days*
- Xtools training *1 day*
- Basic database user training *2 to 3 days*
- Maintenance training *2 to 3 days*

The advanced training is offered for the customer at a time when the software is taking in use. Normally the advanced training provided lasts 3 to 5 days and is given within a six months from the date the software is installed.

The one-day is normally spent for teaching the advanced features in software development i.e. updates in newer Xpipe version. Normally the module-based training is organized in certain dates of the year for all the customers together. (A. Kivelä, interview 27.04)

As following you can find an example of the training days Tekla offers for new users.

User training part 1 – 2 days on site - To ensure that the staff is able to use the system correct, Tekla gives two (2) software user-training periods, each period including two (2) days of hands-on training on the site. Tekla will also follow up the usage by visits and with discussions.

The part 1 of the user training covers

- Data entry
- Network editing
- Network object queries
- Map printing.

User training part 2 – 2 days on site - The part 2 of the user training covers

- Maintenance and condition data entry
- Network condition queries and analyses
- Maintenance planning
- Planning of network inspections
- Work orders and maintenance work follow up

The training is held either at the customer's facility or at Tekla office. Some customers appreciate the environment that Tekla office has for organizing the training. The environment is calm, network conditions are working properly and all the course material needed is easily reached when practicing with the Xpipe software.

Some customers are taught at their own office. In these cases a person from Tekla goes to the customers facilities and gives the training lessons they're using the companies own material. The consultation and advanced trainings are most often to be given at the customer's place. (E. Mäkinen, interview 02.08.2001)

Technical requirements for the Xpipe in Malaysia

Hardware proposed

Servers

- 2x 800MHz processors
- 1,2GB RAM
- The hard disks should be 2 x9GB raid level 1 for the operating system and 3x18GB raid level 5 fort the database (Recommended)
- Hot swap disks are to prefer
- Powerful Ultra160 Raid controller
- Double power supply
- CD-ROM
- 19" display, mouse, keyboard
- WinNT 4.0 Server (Service Pack 5 or higher)
- The web Publishing Software MS Internet Information Server is also required for publishing the Tekla WebMap service within MBKS Intranet. (S.Y. Yong, interview 23.07.2001)

Clients

- 600 MHz Pentium III processor
- 128 Mb RAM (256 Mb is recommended)
- 500 MB disk space
- CD-ROM
- Display driver resolution 1024*768 minimum
- 21" display, mouse, keyboard
- WinNT 4.0 (Service Pack 5 or higher)

- Noted: Web Map clients are running on any PC, which is capable to run Internet Explorer 5.0 or newer. Clients can be operating on Win95, Win98, WIN NT or Win2000. Netscape can also be used, but it requires that the plug-in software that enable Netscape to run ActiveX-components. (S.Y. Yong, interview 23.07.2001)

Other hardware, operation system and database

- | | |
|---|-------------|
| • UPS, APS smart (1400VA) for servers | Recommended |
| • UPS APC back for client work stations | - OPTION |
| • A0 size plotter HP DesignJet 1005CM | - OPTION |
| • Printer, HP Color LaserJet 8500N | - OPTION |
| • Software for hardware: | |
| -Windows NT required | |
| -Oracle DB licenses required | |

Xpipe program is based on the Oracle 8.1 version or Ingres 2.0 version as its database. Operating system is Windows NT or Windows 2000 version (M. Syrakki, interview 20.07.2001; S.Y. Yong, interview 23.07.2001).

It is necessary to inform the customer what is the minimum requirement needed for using the programs. For example, with an old PC's cannot be used for new versions that require more memory capacity to work properly (S.Y. Yong, interview 23.07.2001).

Customer Support

The following can be offered for end users who are on maintenance contracts:

- Free upgrades and releases each year. We are able to guarantee one major upgrade and at least one minor upgrade per year free of charge for end users on maintenance contracts;
- Unlimited access to Tekla's technical personnel for technical queries and on site support (available for Malaysian Users only);

- Unlimited access to Tekla's Extranet (a global network of Xpipe users where you will be able to post technical queries or assist other global users through discussions in this "self-help" forum - available 24 hours a day);
- Attendance at the Annual Xpipe User Days held for Malaysia

These form the basis of some of the basic quantifiable deliverables for being on maintenance. The most important of all is the value of having the manufacturer located right here in Malaysia to offer unparalleled and attentive technical support when it comes to highly personalized issues. (S. Chong, interview 19.07.2001)

Security

Tekla has secured the X-family products in the following ways: First, they are based on the Oracle platform. With the Oracle you will get your own password that you need before you can even enter to the system. Secondly, the X-family programs have own passwords that are needed to get in to the actual program. This password is used also for limiting the access for different files or databases for different users. Thirdly, the customer is responsible for securing its own computer system for denying incorrect accesses and making sure that only certain people can use the X-family products. Tekla holds no responsibility for the customers system.

Tekla has some parts in their program that denies the possibility to use for example Xpipe-software efficiently. Even though you can use the product as an unauthorized user you cannot get a printout of your job because of the secured parts in the program. This does not guarantee that the security is 100 percent sure. As for an example can be mentioned a case where a customer bought one program from Tekla and installed it to the many computer and when the printout was needed, the data was transferred to the computer, which had the licensed software. (T. Ray, interview 27.04 2001; M. Syrakki, interview 06.08.2001)

Especially here in Asia you need to think about the company security of the products, unless you do not want to see your products has been copied and sold out by some local companies. The moral and the ethics here in Asia is not as high as in Finland what comes to piracy and this can harm your company name and the brand if the

copies in any case gets to the markets and the customer use the pirate version as he think it is the original one. The pirates versions normally do not work as well as the original ones do and of course they do not have any guarantee from the company side.

4.4 Recommendations for Xpipe market entry

At a moment Tekla offers the solution for managing the water utilities. Before Tekla can efficiently take Xpipe in use they should have the data of the pipes, their condition and the location. There are only 20 to 40 percent of all the data of the pipes available currently. The digitized and paper land maps of the country should be available before you can efficiently start using Xpipe in Malaysia.

Based on this study, two kinds of solution can be recommended for getting more information about the data of the pipes. First, Tekla or its partner can go to the fields and really start doing the maps and at a same time find information of the pipes. This will take time and can be costly, but on the other hand Tekla will get the overall and detailed information about the situation in Malaysia.

The second possibility is to find the already existing geographical maps and data of the pipes and convert or digitize them to the Xpipe database. This is less expensive method compared to the first choice, but Tekla will also have less information like earlier mentioned; the current data available is only 40 percent at the most. The basic fact is that Tekla need to have data before they can start use the software efficiently. Tekla need to find a certain compromise between the data and the expenses they are willing to pay for getting the data.

In states Sarawak and Sabah the population is sparsely inhabited and that's why it is difficult to built in an efficient pipe system to those areas. Geographically that southern part of Malaysia is poor. In rural areas they do not even have the toilets or water pumps to pump up the water from the wells.

In Malaysia it is important to find a solution to fix the pipes and find a way to offer fresh and clean water for every one. In general the condition of the pipes is in poor

shape and in next five years the country will put huge sums of money for the pipe renovation.

61% of the water pipes are made from asbestos (See appendix 4), which is not good for people health, since its ingredients may cause serious health problems. 40% of all water, which goes through the pipes and is meant to go for households, is wasted to the ground. The government has not tried to clean the wastewater. They have just put chlorine to the drinking water and let the water be like that without being scared of any consequences that costs for humans.

Only in the state of Selangor there are estimated that the cost for repairing the water pipes will cost 1.5 billion RM. If the state has 20 billion RM in their yearly budget for dealing with all their costs, it is hard to think that they will put so much money from their budget for the pipe fixation.

There are basically two groups in water industry that need to be met: First, since every state government is responsible for the development, operations and maintenance of water supplies, it is important for Tekla to create good relationship with them. The state government officials should be met and told how the Xpipe would help them to manage their water utilities and to make them familiar with the product. Once the relationship has been created, there is a better chance to get them to buy Xpipe.

Important authorities in water business are *JKR* (Water Supply Branch, Public Works Department Malaysia) and *MWA* (Malaysian Water Association). These organizations are interested to talk more about the opportunities with Tekla.

In the wastewater field there is only one company that needs to be reached and that is *IWK* (Indah Water Konsortium). They are responsible for every states wastewater systems. In water supply, every state has to be contacted one by one. There are totally 13 states so it is easier to start with the wastewater since only one company needs to be convinced.

Secondly, the non-governmental bodies such as consultants, contractors, suppliers and their own associations like *ACEM* (Association of Consulting Engineers Malaysia) and Institutions like *IEM* (Institution of Engineers Malaysia) should be met in order to get people, who are dealing with the similar functions as Xpipe has, to become interested in and familiar with the Xpipe.

When dealing with the potential customer references are important to convince that the other customer organizations are satisfied with having Xpipe. Since the Xpipe does not have the customer in Malaysia yet, references are vital.

At a moment the main competitor in Malaysia for the Xpipe is AutoCAD based software's from ESRI. While ESRI products in Malaysia are very popular, Tekla should think about how to prove to be different in a way that the local customers are willing to change their current system to Xpipe.

A big challenge is to convince the customer, who already uses the competitor's software, that why they should change the software from currently used one for Tekla's product, for example, what benefits GIS based system can offer in order to beat the competitor.

The Universities play essential role when playing against the competitors. Currently ESRI for example provides their software freely for the Universities to get students to learn how to use their products. Tekla should think about this as one of their strategic plan as well.

Tekla should create a pilot project with some water supplier in Malaysia. In that way they learn how the water treatment plant works in Malaysia and can better find the solution for the demand. Tekla should spend money for the project in order to get a first customer for Xpipe. Also the potential customer should be tied to the project by billing them for the project as well.

Tekla should market Xpipe for local water associations who publish for example magazines related to water industry either internally or externally by making their name more familiar in Malaysian water market. Sponsoring some local events would

serve the same purpose. An example of this is the sport events in Bukit Jalil Stadium, Kuala Lumpur.

The local Web page for Malaysian office should be created, which shows a brief introduction about the company and the products. Though the English is widely spoken in Malaysia, there are still plenty of people especially in government offices whose English skills are not very good and they prefer to get information in Malay language.

For getting to know the local players in Malaysian water industry it is important to take part in local exhibitions or conferences. In exhibitions you can see the competitors latest products and get their brochures as well as find some potential partners for Tekla.

5. Conclusion

Firms do not come experienced in international business overnight, but rather progress gradually through an internationalization process. The process is triggered by different motivations to go abroad. The motivations can be proactive or reactive. Aggressive management initiates proactive motivations, whereas reactive motivations are the defensive response of management to environmental changes and pressures. Firms that are primarily stimulated by proactive motivations are more likely to enter international business and succeed.

Apart from indirect and direct exporting and importing, there are plenty of alternatives for international business entry. The basic advantage of *licensing* is that it does not involve capital investment or knowledge of foreign markets. Its major disadvantage is that licensing agreements typically have time limits, are often proscribed by foreign governments, and may result in creating a competitor. The use of *franchising* as a means of expansion into foreign markets has increased dramatically. Franchisors must learn to strike a balance between adaptation to local environments and standardizing to the degree necessary to maintain international recognizability.

By using *management contracts* for the market entry, longer-term benefits must be worked for and justified to the local firm's owner. In addition, the greatest benefits of its use may be received through the opportunity to develop capable and internationally experienced managers for the contractor's future foreign operations. Varieties of strategic uses and benefits in *subcontracting and contract manufacturing* have contributed to their wider adoption especially cost and risk reduction. With growing number of competitors, *project operations* have become a far more demanding form of international business since the 1980's. By effective use of the project form of international business as a long-term penetration process, many companies have been able to generate continuing, substantial returns beyond the project itself.

The establishment of a foreign subsidiary, in whatever form, may be a defensive move by the firm to maintain its market share and competitive ability in a foreign target market. It might also be part of a defensive strategy, as a way of coping with

increased imports and competition. On the other hand the subsidiary investment could be an aggressive measure aimed at defeating competitors in host or home country markets. The investment might also be viewed as an adaptive strategy, when the firm is following the leader in the industry.

Taken overall the concept of internationalization has yet to be clearly developed as a research object. Nevertheless, considerable progress has been made in establishing its conceptual and empirical foundations, while the emerging debate about the stages thesis or gradual internationalization can be considered a healthy step in clarifying the subject. Given the focus of the concept, a development process through time, much research remains to be conducted that are responsive to its longitudinal character.

After studying the Malaysian water industry it can be said, that the industry has shown substantial progress as the nation accelerates towards becoming an industrialized country. Intensive efforts have been made in the past years to meet the ever-increasing domestic and industrial water demand and to address various water-related issues. Several measures are also in place to face future challenges and to synchronize the water sector's growth to keep in step with the country's overall industrialization process.

Tekla Corporation is the leading supplier of model-based software in the world. Three of Tekla's business areas operate in the international arena and are responsible both for product development and selling the software and related services. Tekla Xpipe provides water and sewerage utilities added value and strategic competitive advantage by optimizing the operations of networks, increasing the efficiency in working processes and improving the customer service and the distribution quality. Malaysia is a potential market for Xpipe and with Tekla's technology and know-how there is an opportunity to become a successful player in Malaysia.

Based on the writer's empirical study, it can be said that Malaysian water markets differ significantly from the Finnish. The competitor's actions must be followed and the market must be known well in order to succeed in Malaysia. This means that company should have subsidiary office in Malaysia in order to be close to the

customers. Another important conclusion is that once the company has gained market share in Malaysia, licensing can be taken into consideration. By generating royalty income, licensing provides an opportunity to exploit research and development already conducted. After initial costs, the licensor can reap benefits until the end of the license contract period. Licensing also reduces the risk of expropriation because the licensee is a local company. This can provide leverage against government action.

The final important conclusion is also that companies who expand their operations abroad should do it in proactive way. Then they have better opportunity to succeed because the expansion is intentional. This study shows, that Tekla's proactive motivation is certainly a unique product. Even though there are competitors in the industry, Tekla's product is unique and therefore the company wants to expand heavily abroad. What needs to be taken under consideration is that how long will such an advantage sustain. Another benefit is naturally the tax benefits. Because the company is listed in Helsinki stock exchange, the shareholder's are expecting continuous growth for their investment. When a company can take advantage of the tax benefits abroad, they can increase their profit, which can lead to an increase in Tekla's share.

References

Books and Articles

- Arpan, J.S. & Radebaugh, L.H. 1985. *International Accounting and Multinational Enterprises*. John Wiley & Sons. New York.
- Aydin, N. & Kacker, M. 1990. International Outlook of U.S.-Based Franchisers. *International Marketing Review* 7, 43-53.
- Boddewyn, J.J. 1979. Foreign Disinvestment: Magnitude and Factors. *Journal of International Business Studies*. Vol. 10, 22-24.
- Brooke, M.Z. 1985a. International Management Contracts. *Journal of General Management*, Vol.11, No. 1, 15-17.
- Brooke, M.Z. 1985b. *Selling Management Services Contracts in International Business*. Holt, Rinehart and Winston, London.
- Bryman, A. 1988. *Quantity and Quality in Social Research*. Unwin Hyman. London & Worcester.
- Buckley, P.J. & Matthew A.M. 1980. Dimensions of the Market Entry Behaviour of Recent U.K. First Time Direct Investor in Australia, *Management International Review* Vol. 20, No. 2, 45-49.
- Cohen, S.S. & Zysman, J. 1986. Countertrade, Offsets, Barter, and Buybacks. *California Management Review* Vol. 28, No 2, 9-11.
- Czinkota, M.R. & Kotabe M. 1992. America's New World Trade Order. *Marketing Management* 1, 49-56.
- Czinkota, M.R., Ronkainen, I. A. & Moffett, M. H. 1999. *International Business* (5th edition). The Dryden Press. Orlando.
- Fram E. H. & Ajami R. 1994. *Globalization of Markets and Shopping Stress: Cross-Country Comparisons*. Business Horizons. New York.
- Gabriel, P.P. 1967. *The International Transfer of Management Skills: Management Contracts in Less Developed Countries*. Harvard University, Division of Research. Graduate School of Business Administration, Boston.
- Guisinger, S. 1987. *Attracting and Controlling Foreign Investment. Economic Impact*. United States Information Agency. Washington D.C.
- Hackett, D. W. 1979. *The International Expansion of U.S. Franchise Systems in Multinational Product Management*. American Marketing Association. Chicago.

- Hedlund, G. 1984. Organization In-Between. *Journal of International Business Studies*, Vol. 15, 33-38.
- Holt-Jensen, A. 1988. *Geography, History, and Concepts*. Paul Chapman Publishing Ltd. London.
- Håkanson, H. 1979. *International Marketing and Purchasing of Industrial Goods*. New York, J. Wiley, 1982. Helsinki 1979.
- Hägg, I. & Hedlund, G. 1979. Case studies in Accounting Research. *Accounting, Organizations and Society*. No. ½, 1979, s.135-143.
- Jones, G. 1996. *The Evolution of International Business*. Routledge. New York.
- Johanson, J. & Vahlne, J.E. 1977. The Internationalization Process of the Firm. *Journal of International Business Studies*, Vol. 8, Spring/Summer, 14-18.
- Juul, M. & Walter, P. 1987. The Internationalization of Norwegian Firms: A Study of the U.K. Experience. *Management International Review*, Vol. 27, No.1, 30-32.
- Kaplan, R.S. 1966. *The Role for Empirical Research Institute for Business Economics* 31, Helsinki.
- Khoury, S.J. 1984. Countertrade: Forms, Motives, Pitfalls, and Negotiation Requisites. *Journal of Business Research* Vol. 12, No. 3, 19-27.
- Kohls, J. & Buller, P. 1994. *Resolving Cross-cultural Ethical Conflict: Exploring Alternative Strategies*. The Dryden Press. Orlando
- Kotabe, M. & Czinkota M.R. 1999. State Government Promotion of Manufacturing Exports: A Gap Analysis. *Journal of International Business Studies*. Vol. 5, No. 1. 637-658.
- Krugman, P. 1992. A Global Economy Is Not the Wave of the Future. *Financial Executive* 8, 10-13.
- Krugman, P.R. 1993. *What Do Undergraduates Need to know about Trade*. AEA Papers and Proceedings. New York.
- Larimo, J. 1987. *The Foreign Direct Investment Decision Process*. Vaasan Korkeakoulun Julkaisuja, Tutkimuksia No. 124, Vaasa.
- Lorange, P. 1986. Human Resource Management in Multinational Cooperative Ventures. *Human Resource Management*, Vol. 25, No. 1. 74-81.
- Luostarinen, R. 1970. *Foreign Operations of the Firm*. Helsinki School of Economics, Helsinki.

- Luostarinen, R. 1978/1. Internationalization Process of the Firm: Different Research Approaches. FIBO Working Paper. Helsinki School of Economics, Helsinki.
- Luostarinen, R. 1979. The Internationalization of the Firm. Helsinki School of Economics, Helsinki.
- Luostarinen, R. & Welch, L. 1990. International Business Operations. Helsinki School of Economics, Helsinki.
- Maanen, J. van 1979. Qualitative Methodology. Sage. Beverly Hills.
- Malaysia Government Publications 1982. The National Water Resources Study. Minister of Finance, Kuala Lumpur.
- Malaysia Government Publications 1996. The Seventh Malaysia Plan (1996-2000). Minister of Finance, Kuala Lumpur.
- Malaysia Government Publications 1999. The National Water Resources Study. Minister of Finance, Kuala Lumpur.
- Malaysian Water Management Sdn. Bhd.1996. Malaysia water industry report. The Malaysian Water Association, Kuala Lumpur.
- Malaysian Water Management Sdn. Bhd.2001. Malaysia water industry guide. The Malaysian Water Association, Kuala Lumpur.
- Marshall, C. & Rossmann, G.B. 1989. Designing Qualitative Research. Sage. Beverly Hills.
- Mattsson, L.-G. 1980. Design of Supply Systems for Technology Transfer. Working Paper 1980/2, Centre for International Business Studies, Uppsala.
- McKinnon, J. 1988. Reliability and Validity in Field Research: Some Strategies and Tactics, Accounting, Auditing and Accountability Journal, No.1 s. 34-35.
- Michalet, C.A., 1980. International Sub-contracting: A state-of-the-art. International Subcontracting. OECD. Paris.
- Minister of Finance Malaysia 2001. The Eighth Malaysia Plan (2001-2005). Minister of Finance, Kuala Lumpur.
- Mäkinen, V. 1980. Yrityksen Toiminnan Tutkimisen Lähestymistavoista. Toimintanalyttisen Tutkimusstrategian Kehittelyä. Tampereen yliopisto. Yrityksen taloustieteen ja yksityisoikeuden laitoksen julkaisuja A:1-17, 1980.
- Naisbitt, J. 1994. Global Paradox. William Morrow. New York.

- Neilimo, K. & Näsi, J. 1980. Nomoteettinen Tutkimusote ja Suomalainen Taloustiede, Tutkimus Positivismin Soveltamisesta. Tampereen yliopisto. Yrityksen taloustieteen ja yksityisoikeuden laitoksen julkaisuja A 2: Tutkielmia ja raportteja 12, 1980.
- Oravainen, N. 1979. Suomalaisten Yritysten Kansainväliset Lisenssi- ja Know-How-sopimukset. Helsinki School of Economics, FIBO Publications, No. 3, Helsinki.
- Porter, M. E. 1990. The Competitive Advantage of Nations. The Free Press. New York.
- Pugh, R.C. 1961. The Promotion of the International Flow of Private Capital. U.N. Report, E/3492. New York.
- Ramirez, A. 1985. The Big Chill At Fluor. Fortune 13.05.1985 Vol. 109. 37-44.
- Reid, S.D. 1981. The Decision-Maker and Export Entry and Expansion. Journal of International Business Studies, Vol. 12.
- Ronkainen, I. A. 1997. "American Politics, Global Trade," The Economist. 27.09.1997, 23-26.
- Schoultz, P. & Vestergaard, H. 1985. Danish Foreign Direct Investments. Paper presented at the Annual Conference of the European International Business Association, Glasgow, Scotland.
- Seah A. 2000. Tekla (M) Sdn Bhd Xpipe. Finpro, Kuala Lumpur.
- Sharma, D.D. 1983. Swedish Firms and Management Contracts, Acta Universitatis Upsaliensis (16). Uppsala.
- Sharma, D.D. 1984. Management Contract and International Marketing in Industrial Goods. International Marketing Management, Praeger, New York.
- Solberg, C.A. 1997. A Framework for Analysis of Strategy Development in Globalizing Markets. Journal of International Marketing 5, 9-30.
- Susman, G.I. & Evered, R.D. 1978. An Assessment of the Scientific Merits of Action Research. Administrative Science Quarterly 4, 582-603.
- Tekla Marketing Material 2001. Xpipe Product Overview. Tekla Marketing Department, Espoo.
- Terpstra, V. 1983. International Marketing, 3rd ed. The Dryden Press. Orlando.
- Thomas, T. 1988. "Brambles' Golden Return-on-Assets Rule", Business Review Weekly, July 29.

- Thornton, E. 1992. Will Japan Rule a New Trade Bloc? *Fortune*. 5.10.1992, 131-132.
- Toyne, B. & Walters, P.G.P. 1989. *Global Marketing Management: A Strategic Perspective*. Allyn and Bacon, Boston.
- Turnbull, P. 1985. Internationalization of the Firm a Stages Process or Not? Paper presented at the conference on Export Expansion and Market Entry Modes. 15-16.10.1985. Dalhousie University, Halifax, Canada.
- U.N. Centre on Transnational Corporations, 1983. *Features and Issues in Turnkey Contracts in Developing Countries*. U.N., New York.
- Vihma, P. 1993. Trading Blocs: Opportunity or demise for International Trade? *Multinational Business Review* 1, 1-9.
- Waelbroeck, J. 1980. *Measuring Degrees of Process in Economic Integration. Economic Integration, Worldwide, Regional, Sectoral*. Macmillan, London.
- Welch, L.S. 1983. *Licensing Strategy and Policy for International and Technology Transfer. Export Promotion: The Public and Private Sector Interaction*. Praeger, New York.
- Yang, Y.S., Leone, R.P. & Alden D.L. 1992. A Market Expansion Ability Approach to Identify Potential Exporters. *Journal of Marketing* 56, 82-96.
- Yin, R.K. 1984. *Case Study Research, Design and Methods*. Sage. Beverly Hills.
- Österberg, R. 1983. *Kansainvälistyvien teollisuusyritysten organisaatorakenne ja sen kehitys*. FIBO-Publications 23, Vientikoulutussäätiö, Helsinki.

Interviews

Chong Solomon, Regional Sales Manager (Asia Pacific Region), Tekla (M) Sdn. Bhd. Kuala Lumpur, Malaysia. Bhd. 19.07.2001

Ir. Low Poh Fee, Senior Superintendent Engineer, Water Supply Branch, Public Works Department Malaysia. Kuala Lumpur, Malaysia. 07.08.2001

Ir. Mohd Adib HJ. Awang Noh, Chief Executive Officer, InterWater Industries (M) Sdn. Bhd. Kuala Lumpur, Malaysia. 30.07.2001

Kivelä Are, Sales Engineer, Sales Department, Tekla Oyj. Espoo, Finland. 27.04.2001

Kokkonen Pauliina, Software Specialist, Service Department Tekla Oyj. Espoo, Finland. 26.04.2001

Mäkinen Erkki, Customer Service Manager, Service Department Tekla Oyj. Espoo, Finland. 27.04.2001 and 02.08.2001

Nässi Ari, Managing Director (Asia Pacific Region), Tekla (M) Sdn Bhd Southeast Asia. Kuala Lumpur, Malaysia. 31.07.2001

Ray Tomas, Senior Consultant, Public Infrastructure Department, Tekla Oyj, Espoo, Finland. 25.04.2001 and 27.04.2001

Syyrakki Matti, Research and Development Manager, Tekla (M) Sdn Bhd. Kuala Lumpur, Malaysia. 20.07.2001 and 06.08.2001

Yong Sun Yong, Area Manager, Xcity Products Malaysia, Tekla (M) Sdn Bhd. Kuala Lumpur, Malaysia. 23.07.2001

Websites

Asianinfo.org, WebPages 2001. <http://www.asianinfo.org>, 21.08.2001

ESRI, Environmental Systems Research Institute, WebPages 2001. ESRI Co.: <http://www.esri.com>, 14.08.2001

Tekla WebPages 2001. Tekla Oyj: <http://www.tekla.com>, 27.04.2001

Appendices

Appendix 1

Table 1.1 Number of single-purpose dams

Table 1.2 Number of multi-purpose dams

Appendix 2

Table 2.1 Percentage of non-revenue water (%NRW) 1999

Figure 2.1 Percentage of non-revenue water by state 1999

Appendix 3

Table 3.1 Water supply capacity and demand in Malaysia 1992-1999

Figure 3.1 Water supply capacity and demand in Malaysia 1992-1999

Appendix 4

Table 4.1 Total lengths of pipes (>100mm) and types of pipes in 1999

Figure 4.1 Types of pipes by percentage in 1999

Appendix 5

Table 5.1 Percentage of population served in urban and rural areas in 1999

Figure 5.1 Percentage of population served in urban and rural areas in 1999

Appendix 6

Table 6.1 Waterworks staff employed in 1999

Figure 6.1 Percentage of categories of waterworks staff employed in 1999

Appendix 1

Table 1.1 Number of single-purpose dams

	Single-Purpose	NOS.
1	Water Supply	37
2	Hydropower	8
3	Irrigation	3
4	Silt Retention	3
5	Recreational	2
	Total	53

(Malaysia water industry guide 2001, 48)

Table 1.2 Number of multi-purpose dams

	Multi-Purpose	NOS.
1	Water Supply + Irrigation	6
2	Water Supply + Flood Control	5
3	Water Supply + Irrigation + Flood Control	2
4	Hydropower + Flood Control	2
5	Hydropower + Water Supply	1
	Total	16

(Malaysia water industry guide 2001, 48)

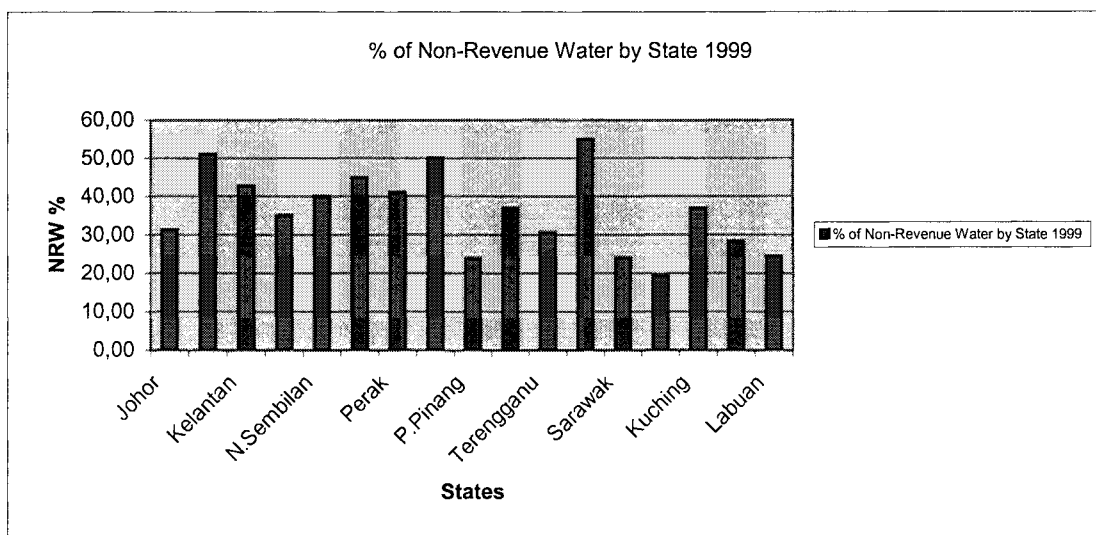
Appendix 2

Table 2.1 Percentage of non-revenue water (%NRW)1999

States	Given% NRW 1999
Johor	31,33
Kedah	51,12
Kelantan	42,80
Melaka	35,00
N.Sembilan	40,00
Pahang	45,00
Perak	41,08
Perlis	50,10
P.Pinang	23,80
Selangor	37,00
Terengganu	30,65
Sabah	55,00
Sarawak	24,00
Laku	19,30
Kuching	37,00
Sibu	28,38
Labuan	24,43
Total	36,23

(Malaysia water industry guide 2001, 65)

Figure 2.1 Percentage of non-revenue water by State 1999



(Malaysia water industry guide 2001, 65)

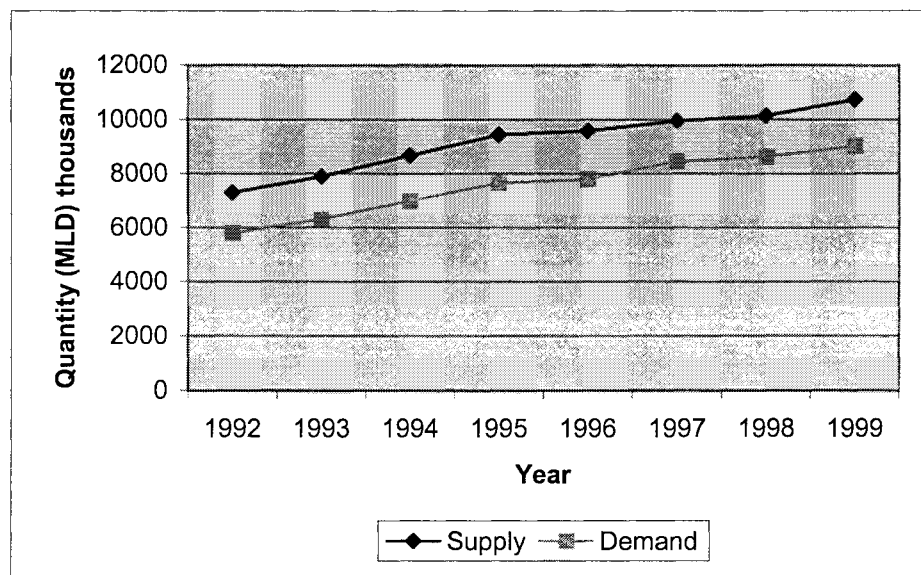
Appendix 3

Table 3.1 Water supply capacity and demand in Malaysia 1992 - 1999

Year	Supply (MLD)	Demand (MLD)
1992	7299	5796
1993	7897	6317
1994	8670	6989
1995	9442	7662
1996	9580	7800
1997	9948	8457
1998	10141	8623
1999	10730	9029

(Malaysia water industry guide 2001, 58)

Figure 3.1 Water supply capacity and demand in Malaysia 1992 - 1999



(Malaysia water industry guide 2001, 58)

Appendix 4

Table 4.1 Total length of pipes (>100mm) and types of pipes in 1999

States	Length of Pipes (km)	Types of Pipes							
		AC	MS	DI	CI	PE	uPVC	Others	
Johor	9000	5477	880	329	200	315	1761	38	
Kedah	7257	3940	917	151	115	623	1511	-	
Kelantan	4179	3687	89	143	12	18	200	30	
Melaka	3280	2551	100	45	36	25	33	490	
N.Sembilan	5516	3656	371	32	32	101	110	1214	
Pahang	12166	8308	1641	110	42	1590	474	1	
Perak	7502	5349	657	55	223	387	830	-	
Perlis	1594	1059	149	4	4	375	3	-	
P.Pinang	3337	1750	351	42	142	-	93	959	
Selangor	11578	6325	3587	240	254	309	863	-	
Terengganu	4506	2229	398	150	16	193	1520	-	
Sabah	5642	2819	560	375	29	685	937	237	
Sarawak*	3000	1281	-	574	-	1142	1	1	
Laku	894	523	26	176	1	167	-	1	
Kuching	1461	612	78	396	254	-	-	122	
Sibu	654	35	15	328	95	137	-	44	
Labuan	342	237	18	32	-	54	-	1	
Total	81908	49838	9837	3182	1455	6121	8336	3138	

*Excluding Laku, Kuching and Sibul

AC = Asbestos Cement

MS = Mild Steel

DI = Ductile Iron

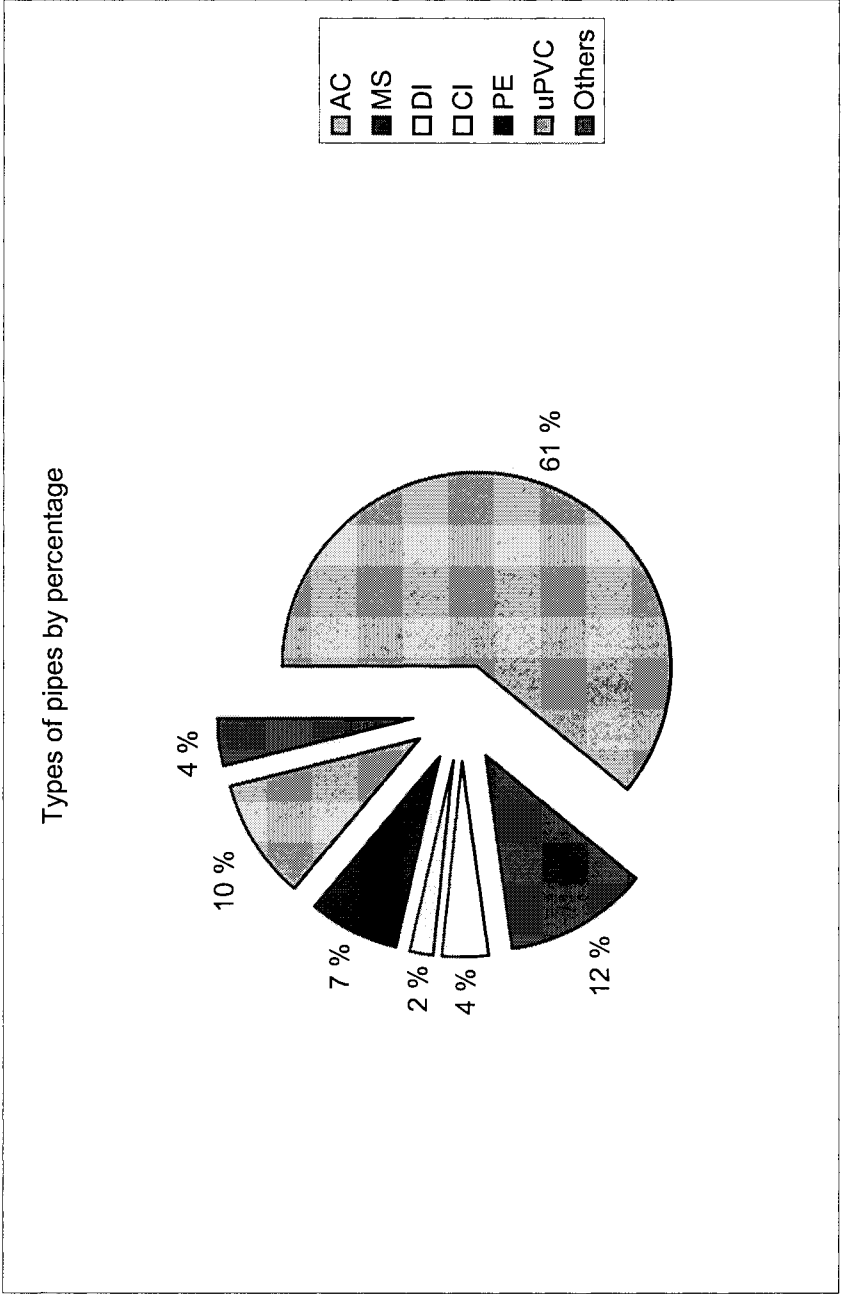
CI = Cast Iron

PE = Polyethelene

uPVC = unprestigtise Polyvinylel Choride

(Malaysia water industry guide 2001, 61)

Figure 4.1 Types of pipes by percentage in 1999



(Malaysia water industry guide 2001, 61)

Appendix 5

Table 5.1 Percentage of population served in urban and rural areas in 1999

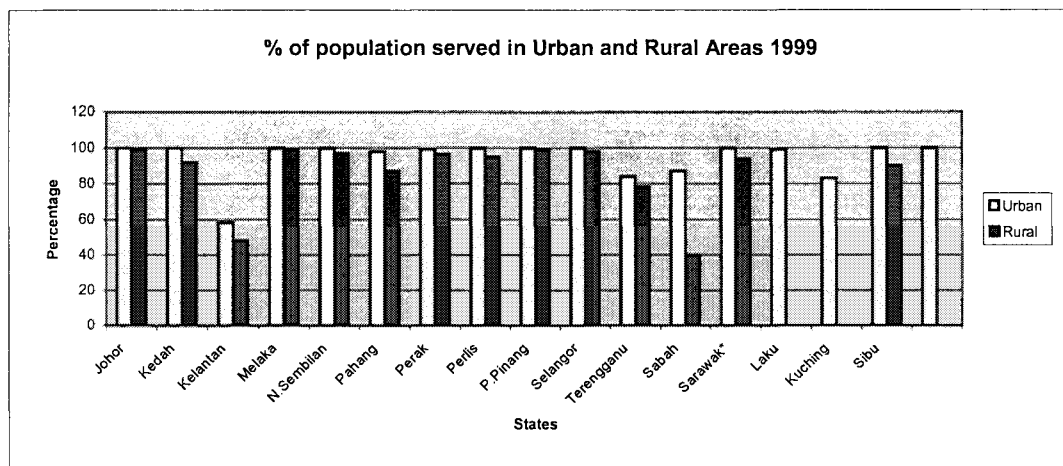
States	% Population Served		
	Population served	Urban	Rural
Johor	2665256	100	99
Kedah	1639826	100	92
Kelantan	739510	58,3	48
Melaka	N.A.	100	99
N.Sembilan	903100	100	97
Pahang	1326000	98	87
Perak	1943938	99,4	96,6
Perlis	218500	100	95
P.Pinang	1486653	100	99
Selangor	5036233	100	98
Terengganu	874456	83,9	78,2
Sabah	1567707	87	40
Sarawak*	1956000	100	94
Laku	254000	99	N.A.
Kuching	507276	83	N.A.
Sibu	239863	100	90
Labuan	70000	100	N.A.
National Average	21428318	98	90

*Excluding Laku, Kuching and Sibu

N.A.= Not Applicable

(Malaysia water industry guide 2001, 63)

Figure 5.1 Percentage of population served in urban and rural areas in 1999



(Malaysia water industry guide 2001, 63)

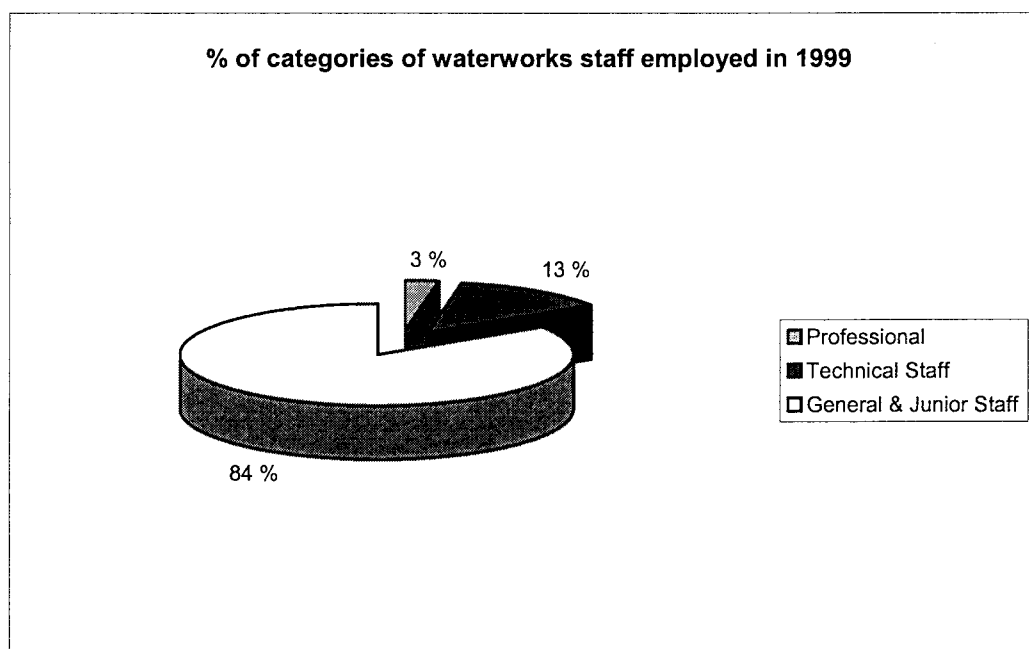
Appendix 6

Table 6.1 Waterworks staff employed in 1999

States	Professional	Technical Staff	General & Junior Staff
Johor	47	307	1139
Kedah	23	134	763
Kelantan	21	79	373
Melaka	15	53	583
N.Sembilan	13	50	533
Pahang	21	192	1825
Perak	37	161	958
Perlis	2	19	110
P.Pinang	21	101	877
Selangor	35	137	1014
Terengganu	33	187	371
Sabah	43	45	1320
Sarawak*	18	74	560
Laku	16	151	164
Kuching	14	41	520
Sibu	7	29	146
Labuan	7	6	108
Total	373	1766	11364

*Excluding Laku, Kuching and Sibu
(Malaysia water industry guide 2001, 64)

Figure 6.1 Percentage of categories of waterworks staff employed in 1999



(Malaysia water industry guide 2001, 64)