

Information Technology and the Challenge for Hong Kong

edited by Janice M. Burn and Maris G. Martinsons



Hong Kong University Press
香港大學出版社

Hong Kong University Press
The University of Hong Kong
Pokfulam Road, Hong Kong

© Hong Kong University Press 1997

ISBN 962 209 420 1

All rights reserved. No portion of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage or retrieval system, without permission in writing from the publisher.

Printed in Hong Kong by Nordica Printing Co., Ltd.

Contents

Preface	vii
Contributors	ix
Section 1 Information Technology in Asia: The Role of Hong Kong as a Regional and Global Hub	1
1. Hong Kong as a Hub for Regional and International Business <i>Janice M. Burn</i>	3
2. IT Policies and Information Infrastructures: Comparing Hong Kong to the Singapore Model <i>Maris G. Martinsons</i>	27
3. Hong Kong's Communication Infrastructure: The Evolving Role of a Regional Information Hub <i>Ben Petrazzini & John Ure</i>	61
4. Electronic Commerce and EDI in Asia <i>Janice M. Burn & Ali F. Farhoomand</i>	91
Section 2 Practices, Problems and Productivity in Hong Kong	119
5. The Use of Information Technology: Practices and Problems <i>Eugenia M.W. Ng Tye & Patrick Y.K. Chau</i>	121
6. IT Manpower Issues in Hong Kong <i>Patrick Y.K. Chau & Eugenia M.W. Ng Tye</i>	141
7. Improving Application Development Productivity: A Hong Kong Study <i>Sunro Lee and Roy Schmidt</i>	169

vi	Contents	
8.	CASE in Hong Kong <i>Jahangir Karimi & Chan Wan Kong</i>	193
9.	Business Process Change Enabled by Information Technology: Case Studies and Cultural Constraints <i>Maris G. Martinsons</i>	221
	Section 3 Strategic Application and Exploitation of IT in Hong Kong	249
10.	The Strategic Application of IT in Hong Kong <i>Janice M. Burn</i>	251
11.	Information Technology to Enable Global Banking: The HongkongBank and HEXAGON <i>Maris G. Martinsons</i>	267
12.	Strategic Use of IT for Competitive and Cooperative Advantage by Small-Medium Local Banks in Hong Kong <i>Steve R. Elliot</i>	299
13.	Strategic Approach to Information Technology at the Hong Kong Jockey Club <i>Claudia Loebbecke & Robert W. Blanning</i>	319
14.	SMART Use of Information Technology in Hong Kong <i>Janice M. Burn</i>	341
15.	Strategic Use of IT in Port Management <i>Janice M. Burn & Colonel Kwok Ho Szeto</i>	357
	Index	381

Contributors

Janice M. BURN, Foundation Professor of Management Information Systems, Edith Cowan University, Perth, Australia; formerly Associate Professor, Hong Kong Polytechnic University, Hong Kong.

Maris G. MARTINSONS, Associate Professor, City University of Hong Kong, and Research Director, Pacific Rim Institute for Studies of Management.

Robert BLANNING, Professor, Vanderbilt University; formerly Visiting Professor, Hong Kong University of Science and Technology, Hong Kong.

CHAN Wan Kong, Research Assistant, Hong Kong University of Science and Technology, Hong Kong.

Patrick Y.K. CHAU, Assistant Professor, Hong Kong University of Science and Technology, Hong Kong.

Steve ELLIOT, Associate Professor, University of New South Wales; formerly Senior Lecturer, Open Learning Institute, Hong Kong.

Ali F. FARHOOMAND, Associate Professor, The University of Hong Kong, Hong Kong.

Jahangir KARIMI, Professor, University of Colorado at Denver, USA; formerly Visiting Professor, Hong Kong University of Science and Technology, Hong Kong.

Sunro LEE, formerly Associate Professor, Hong Kong University of Science and Technology, Hong Kong.

Claudia LOEBBECKE, University of Cologne, Germany; formerly Visiting Researcher, Hong Kong University of Science and Technology, Hong Kong.

Eugenia M.W. NG TYE, Lecturer, Institute of Education, Hong Kong.

Ben PETRAZZINI, Strategic Planning Unit, International Telecommunication Union, Geneva.

x Contributors

Roy SCHMIDT, Assistant Professor, Hong Kong University of Science and Technology, Hong Kong.

Colonel SZETO, Research Student, Hong Kong Polytechnic University, Hong Kong.

John URE, Director of the Telecommunications Research Project, Centre of Asian Studies, and Assistant Professor, The University of Hong Kong, Hong Kong.

Section 1

Information Technology in Asia: The Role of Hong Kong as a Regional and Global Hub

Section 1 presents an overview of the social and economic fabric which makes up the dynamic East Asia region.

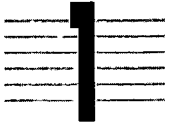
In the first chapter, Janice Burn describes the socio-economic context of the Asia Pacific region and the role of Hong Kong as both a regional and international hub for business. The particular role of Hong Kong as a gateway to China (the world's largest unexploited market) and as a shopfront for China trading is discussed in relation to Hong Kong's economic success. An introduction is given to the role which IT plays in the development of the territory, and comparison is made with IT development and economic growth in the other members of the 'Four Dragons' — Korea, Taiwan and Singapore. This chapter also highlights some of the political and cultural differences which are more fully discussed in following chapters and some of the problems associated with effective IT application in the territory.

Chapter 2, by Maris Martinsons, provides a comparative analysis of the impact of government policy on IT initiatives using Singapore and Hong Kong as examples. The chapter reviews the Singaporean government-led initiative to capitalize on IT driven expansion and contrasts this with the 'laissez-faire' policy adopted by the Hong Kong government. Government policies are analysed and the use of IT within the government itself is explored. The chapter questions the role of governments in IT legislation and provides a backdrop for Chapter 4 where the development of EDI is examined throughout the Asian region.

In Chapter 3, Ben Petrazzini and John Ure describe the communication infrastructure of Hong Kong with extensive regional comparisons. The evolving role of Hong Kong as a regional information hub and its central role for China is discussed in some detail and the effects of forthcoming

deregulation in the communications industry analysed with respect to the competitive challenges which the industry will face. The chapter highlights Hong Kong's reliance on one of the most effective communications' infrastructures in the world today.

Section 1 closes with a chapter by Janice Burn and Ali Farhoomand where the issues related to effective development of electronic commerce are evaluated. Chapter 4 first reports on the results of an Asian-wide study on electronic commerce usage, problems and practices and suggests a model for effective implementation. These issues are then discussed within the particular contexts of Singapore and Hong Kong where EDI developments provide a startling contrast of experiences. The chapter concludes with an analysis of the recent 'Golden Projects' proposed by China to bring electronic commerce from a vision into a reality for the 21st century.



Hong Kong as a Hub for Regional and International Business

Janice M. Burn

A unique situation, one of the greatest success stories, can be found in Hong Kong, once described as 'a borrowed place on borrowed time'. This chapter looks at the development of Hong Kong, the nature of its 'special' relationship with China, the role of the other three Dragons as major competitors, the growing influence of the young but developing 'Lions', and the special threats and opportunities which the next century presents to the region as a whole.

Introduction

The Asia Pacific Region

The rapid and sustained economic growth experienced throughout the Asia Pacific region over the last few decades has led many economists to label the 21st century as the 'Asia Pacific' century. This may originally have been fuelled by the remarkable progress of Japan over the last half century, but, more recently, has referred to 'Emerging Asia': newly industrialized economies (NIEs) — South Korea, Taiwan, Singapore, Hong Kong, China and India — and the remaining members of the Association of Southeast Asian Nations (ASEAN) — Brunei, Indonesia, Malaysia, the Philippines, Thailand and, the most recent member in 1995, Vietnam.

In particular, the progress of the 'Four Dragons' (Hong Kong, Singapore, South Korea and Taiwan) has aroused considerable global interest. These NIEs have encouraged export-driven expansion, developed remarkable transportation and communication infrastructures and facilitated the creation of joint ventures and capital markets. This has coincided with a new political-economic dynamic that has taken root in Asia and most remarkably, the liberalization of economics in China's pursuit of a 'socialist market economy'. The opening up of a vast new market of eager consumers has made China one of the top investment prospects and also promises additional trading growth throughout Asia.

The expansion of telecommunications facilities throughout the region and national informatization programmes have further advanced the image of Asia as the global hub for the future century. Asia, however, cannot be treated as a global village representing as it does so many different cultures and stages of development. For example, China's mixture of state, collective, private and foreign-owned enterprises stands in contrast to Japan, where big private conglomerates have been at the forefront of economic growth, and Taiwan, where the family business has been perhaps the main contributor to material success (Kohut, 1995).

To some extent, the Dragons can be considered as developed economies, following in the footsteps of Japan, especially when compared with the developing countries in Asia such as Thailand, Malaysia and the Philippines (young 'Lions'), and the emerging countries such as China, India, Vietnam and Indonesia. Table 1.1 shows the current stages of development in the region.

Table 1.1
Stages of Development in Asia

<i>Mature</i>	<i>Newly Industrialized</i>	<i>Fast Developing</i>	<i>Developing</i>
Japan	Hong Kong Singapore	Brunei	Indonesia China Vietnam
	South Korea Taiwan	Thailand Malaysia South China	Philippines India (rural) Cambodia
		India (urban)	
Stagnation	Innovation	Industrialization	Imitation

Hong Kong — A Unique Territory

In 1841 the 19th-century British Foreign Secretary Lord Palmerston dismissed Hong Kong as 'a barren island with hardly a house upon it'.

Hong Kong, a city state on the southern coast of China covering an area of only 1,060 square kilometres (of which 70% is green field) and with a population of around six million, was the first developing economy to become one of the world's top 10 trading communities as of 1991 and in 1994 was number five. A British Crown Colony for over 150 years, it was reverted to Chinese sovereignty in 1997. To better understand its economic success and the opportunities and threats it will face, it is necessary to review some of the major historical events which have made Hong Kong a dynamic and vibrant multi-cultural society.

Hong Kong's development into a commercial centre began in 1841 when British merchants, restricted to a small 'factory' area on the Pearl river near Guangzhou, established a successful trading industry especially in the export of tea. By the end of the 19th century Britain imported approximately 15 million tonnes of tea annually. A shortage of silver bullion in India and Europe led to the use of opium as payment for goods bought in Guangzhou and was to lead to the first Opium War of 1840–41 and the beginning of the British acquisition of Hong Kong.

Hong Kong was acquired by the British from China in three stages: Hong Kong Island by the treaty of Nanking in 1842; 14 years later a second war led to the ceding of the Kowloon peninsula by the Convention of Peking in 1860; and finally, the New Territories — consisting of the mainland area adjoining Kowloon and 235 adjacent islands — were ceded through a 99-year lease under the Second Convention of Peking in 1898. While administered by the British during much of the 19th and 20th centuries, Hong Kong is geographically, ethnically (97%) and culturally Chinese, with an interdependent history and destiny.

Between 1842 and 1950, Hong Kong served as a staging post for trade between China and the West. The Communist take-over of China in 1949 and the Korean War in the early 1950s marked the end of Hong Kong as an entrepôt port with UN trade embargoes on China. However, floods of refugees from China rapidly boosted the colony's population by one million. They included many wealthy entrepreneurs from Shanghai and provided the basis for Hong Kong's industrialization. Initially, textiles and clothing were produced, but later, in the mid-1960s, this was expanded to include plastic, toys and leather goods.

Over the next two decades Hong Kong thrived on its manufacturing base, with textiles surpassed by clothing, and new sectors emerging such as printing, metal goods and machinery, watches and electronic parts and appliances. For consumer goods, the reliance in the earlier years on subcontracting and sales to relatively few major retailers, predominantly in the United States and Europe, was extended to the sale of branded goods to a wider customer base around the world. Support services in the financial sector, transport and telecommunications also thrived. Developments in

tourism (over 11 million visitors in 1994) led to massive growth in the hotel and catering trades as well as in retailing.

The Open Door Policy enacted by China in the late 1970s led to another renaissance of the Hong Kong economy. Trade with China flourished and Hong Kong was transformed from a cheap manufacturing base into a regional service and financial centre, while exporting many of its factories across the border to take advantage of lower costs.

Today Hong Kong is once again a great entrepôt centre for not only the vast trade in and out of southern China but also that with the rest of the world. On an earnings-per-capita basis Hong Kong became the world's top exporter in 1993, exporting goods worth more than US\$20,000 per head. With one of the finest natural deep-water harbours in the world, Hong Kong carried over 100 million tonnes of commercial cargo by sea and river routes and 20 million passengers on international sea routes in 1993. It also now boasts the world's busiest container port with more than 11 million TEUs (twenty-foot equivalent units) being handled in 1994 — an increase of 300% in just a decade. Associated with this are all related trade support services and communications infrastructure. This will be further enhanced with the completion of the new international airport at Chek Lap Kok, which, with 4,500 acres of land reclamation, is one of the world's largest civil engineering projects. This will replace the existing airport, which is the fourth busiest in the world in terms of international passengers and freight.

Organizational Use of IT in Hong Kong

Hong Kong is a prolific user of IT; however, the overall pattern of computerization must be viewed in terms of organizational profiles. In Hong Kong the most striking organizational characteristic is the very small size by number of employees. Very few enterprises apart from government and allied subvented organizations employ more than 200 people. According to government statistics (1994) there are only some 40 businesses with more than 1,000 employees while there are more than 200,000 with fewer than 50 employees. Small organizations are generally operated as owner-controlled companies with close relatives employed in key positions as a direct result of family links rather than professional qualifications. Even larger family-based companies with public capital and acquired subsidiaries still maintain a style of management which is basically owner-centred with increasingly distant concentric circles of family members. Research into business practices of Chinese (Bond, 1991; Redding and Wong, 1986; Tricker, 1991) have identified five characteristics:

- family-centred firms

- closely held control, even with public funding
- centralized decision making
- paternalistic management style
- intuitive strategy formulation

As a result, very few companies have formal IT or indeed formal management expertise at senior management level. IT is often seen as a necessary evil rather than as a strategic tool and the use of advanced Decision Support Systems or Executive Information Systems is confined to a few of the larger IT users. High levels of investment in IT are often impractical and overall the figures for IT investment vary from an average close to 8% of the companies' total revenue for the top 40 IT users to around 3% for medium and small users (King et al. 1992).

Large businesses have readily adopted computer technology as have some government departments and government subvented organizations. However, it is only recently that the government has felt the need to consider a comprehensive IT strategy. Unlike many other Asian countries (Singapore, South Korea, Thailand, Malaysia, India, Taiwan, Philippines), the government in Hong Kong plays a non-directive role with regard to IT policy and gives no preferential treatment to the IT sector (discussed more fully in Chapter 2). Increasingly, this has had a detrimental effect on the coordinated development of an IT infrastructure, particularly in the delayed adoption of EDI (Electronic Data Interchange) where Hong Kong now lags some five years behind Singapore (discussed more fully in Chapter 4).

A Role Model for Change

Although political power was officially concentrated in the hands of the British, it has long been accepted that Hong Kong is actually ruled by the hongs (long-established trading companies), the myriad of financial institutions led by the HongkongBank, the Hong Kong Jockey Club (which not only controls the only legal form of gambling in Hong Kong but also administers profits as charities and donations to improve the educational and social infrastructure of the territory) and then the Governor. As the 1997 change of sovereignty approached, the influence of China was increasingly evident with its involvement in infrastructure and financial decisions as well as its opposition to political reform. Nevertheless, Hong Kong continues to enjoy enviable levels of economic prosperity and personal freedom and to act as the primary gateway between China and the global economy. Hong Kong has facilitated the transfer of technology and management prac-

tices into the awakening socialist giant and provided the main channel for exports and imports. It can also be seen as an economic model for developments in the great cities of China (Young, 1983), acting as a testbed of six million people for the future prosperity of 1.2 billion on the mainland. Indeed, Hong Kong can be considered a vanguard of the dynamic environments which are expected to become commonplace for enterprises around the world (Martinsons, 1993).

The economic success of Hong Kong has been based on, and stabilized by, its proclivity for entrepreneurship. The steady demand for innovation as a response to change contrasts with the typically cyclical prices of the commodities on which many emerging economies are dependent. Nevertheless, a vulnerability to the vagaries of export markets has also endowed Hong Kong with a built-in resilience and a capacity to readily adjust to international economic fluctuations. Akin to a learning organization, the territory has gained enormous collective experience from both its successes and failures. Hong Kong has learnt to thrive on change. The result has been some amazingly swift transitions in the underlying economic structure of Hong Kong which reflect both the territory's pursuit of materialistic goals and the dynamism which is a feature of Hong Kong life.

Hong Kong Economic Infrastructure

Resource-Limited Economy

Due to its limited natural resources, Hong Kong has to depend on imports for virtually all its needs including food and other consumer goods, raw materials, capital goods, fuel and even water. It must, therefore, export on a sufficient scale to generate foreign exchange earnings to pay for these imports and the volume of exports must continue to grow if the population is to enjoy a rising standard of living (currently second only to Japan in Asia and with low unemployment).

The externally oriented nature of the economy can be seen from the fact that in 1993 the total value of visible trade amounted to 250% of GDP. Over the last decade Hong Kong's total exports grew at an average annual rate of 17% in real terms, roughly twice the growth rate of world trade. The relative importance of the various sectors can be assessed in terms of their contributions to GDP and to total employment. The most notable change is in the manufacturing sector with a continuous decline in GDP from 31% in 1970 to 13% in 1992 and in employment from 47% in 1971 to 22% in 1993. Concomitantly, the tertiary services sector contribution rose from 60% in

1970 to 76% in 1992 with a rise in employment from 41% to 69% over the same period. Manufacturing firms in Hong Kong are characterized by their small size — of close to half a million establishments, more than half employ less than 50 people (Hong Kong Government Statistics, 1994).

The scarcity of land in Hong Kong also means that most manufacturing industries operate in 'flatted factory' units. These are multi-storeyed factory units which favour only light manufacturing industry. These form the basis of an extensive subcontracting system which allows the manufacturing sector greater flexibility in coping with frequent changes in demand patterns. However, it also inhibits the development of high-tech manufacturing facilities and costs are directly related to escalating wages. As a result there is increasing use of labour outsourcing using China production for labour-intensive processes. In fact, most of the value-added component is actually added across the border, where 80% of the territory's manufacturers have built plants (Asia 1994 yearbook). There are now 30,000 Hong Kong factories in China employing almost three million people (Trade Development Council, 1994). Faced with rising labour costs, Hong Kong also exports service jobs across the border. This is particularly the case for software production and standard data-processing activities with both Cathay Pacific (Hong Kong's airline) and Citicorp outsourcing IT staff in Shenzhen and many other groups establishing 'software factories' with the cooperation of the Chinese government. Citibank and IBM are also in the process of moving their China headquarters from Hong Kong to Shanghai.

Hong Kong as an International Financial Centre

The favourable geographical position of Hong Kong, which provides a bridge in the time gap between North America and Europe, together with strong links with China and other economies in Southeast Asia and excellent communications with the rest of the world, has helped the development of the territory into a major international financial centre. With an average daily turnover of around US\$61 billion in 1992, Hong Kong is the second largest stock market in Asia after Tokyo.

Foreign banks in Hong Kong tend to be the premier banks in their countries of incorporation and in 1993, 81 of the top 100 world banks had operations in the territory. In total there were 172 licensed banks with HongkongBank the largest local bank and 10th in the world market. A substantial proportion of the transactions in the banking sector are international in nature with more than 60% of the sector's aggregate assets and liabilities external. This ranks Hong Kong fourth largest in the world.

The stock market also serves as an important source of capital with 477

public companies listed as at the end of 1993. Total market capitalization of HK\$2,975 billion places Hong Kong sixth in the world after the US, Japan, Britain, Germany and France.

As a result of increasing cooperation between Hong Kong and China, Hong Kong is now the largest source of investment in China, accounting for two-thirds of the total. This comes not only from the developing manufacturing base but also from hotels and tourist-related facilities and property and infrastructure developments.

Economic policy in Hong Kong is to a large extent dictated, and constrained, by the special circumstances of the economy. Owing to its small size and open nature, the economy is vulnerable to external factors, and government actions designed to offset unfavourable external influences are of limited effectiveness. Moreover, the government considers that the allocation of resources in the economy is best left to market forces, with minimal government intervention in the private sector. This basically free-enterprise, market disciplined system has led to Hong Kong's economic success over the last 100 years. A new government, however, came into operation in 1997 and it remains to be seen whether a 'laissez-faire' policy can support the continued development of Hong Kong as an international centre while integrating it into China. Under the terms of the Sino-British Joint Declaration (1984), Hong Kong became a 'Special Administrative Region and the existing capitalist system and way of life shall not be changed for 50 years' (Article 3 of Basic Law, 1990). There are, however, many possible interpretations of the guarantees which the Basic Law enshrines and how these might be implemented.

Industry and Trade

Hong Kong's trade policy seeks to promote a free, open and stable multilateral trading system where government neither protects nor subsidizes industries. As a result Hong Kong has always participated in the General Agreement on Tariffs and Trade (GATT) and in 1986 became a separate contracting party. This status, which underlines Hong Kong's autonomy in the conduct of its external relations, is intended to continue after the handover to China with membership participation in the World Trade Organization (WTO) which replaced GATT in 1995. China sought unsuccessfully to regain membership of GATT in 1994 but still actively strives for membership of WTO and, in July 1995, was awarded observer status. Having risen from 31st trading nation in the world in 1980 to 11th in 1993 with an average annual economic growth rate of 10%, China nevertheless still has to achieve considerable growth to provide a trading infrastructure to support WTO

membership and full participation. Hong Kong is also a member of the Asia-Pacific Economic Co-operation Council (APEC) which actively seeks to identify a range of practical common economic interests to further the development of the Asia Pacific region. One problem, however, relates to trade relations between China and the US, as the annual uncertainty of the renewal of China's Most-Favoured Nation (MFN) trading status with the US (which is linked to both economic and social change) has a direct impact on the economic well-being of Hong Kong.

China is the principal supplier of imports to the territory, the largest single export market and the major contributor to and beneficiary from the re-export market (approximately 80% of the combined total of domestic exports and re-exports). Table 1.2 shows the most recent figures on Hong Kong's imports, exports and re-exports.

Table 1.2
Hong Kong (1993) Trade Statistics (HK\$ million)
External Trade by Major Trading Partners

<i>Market</i>	<i>Domestic Exports</i>	<i>Re-exports</i>	<i>Imports</i>
China	63,367	274,561	402,161
US	60,292	180,349	58,837
Germany	13,969	40,798	24,918
UK	10,771	24,530	21,438
Japan	9,677	44,160	178,034
Singapore	11,344	17,430	47,835
Taiwan	6,261	21,910	93,968
Korea	*	15,538	48,220
Total Figures for 1993 (all trading partners)			
Total	223,027	823,224	1,072,597

Source: HK government statistics (1994).

The major industries supported by the manufacturing sector in Hong Kong are (in order of contribution) clothing, electronics, textiles, watches and clocks, and plastics. Faced with increasing competition from the low-cost economies in the region, rising labour costs at home and demand for higher levels of quality, manufacturers are moving away from labour-intensive production and into value-added products. The government, which supports this restructuring, gives strong encouragement to quality assurance programmes and ISO 9000 is now the de facto standard to be applied for award of certification.

In support of the industrial and trading sectors the use of Electronic Data Interchange (EDI) has expanded considerably (although the territory

is well behind Singapore in this respect). A consortium of 11 leading trade-related organizations with a substantial government shareholding established Tradelink. Tradelink will fund and manage a Community Electronic Trading Service (CETS) and act as the gateway between the community and relevant government departments. The initial launch of the service was in 1997. This year will also see the further liberalization of the telecommunications industry with all services, data, fax and voice, within Hong Kong, open to competition. Hongkong Telecom International will maintain an exclusive licence until 2006 to provide a range of public services for international telecommunications.

Infrastructure Growth

Hong Kong had the world's first fully digitized telephone system and has one of the highest per capita ownership of telephones at approximately 65:100 population (Trade Development Council, 1994). This is further reinforced with the highest per capita ownership of cellular phones and pagers, and the largest cable network, television set and VCR ownership. The transportation system is one of the cheapest and most efficient in the world with four million commuters using public transport daily. The multiple transportation services — rail, bus and ferries — implemented the world's largest smartcard system in 1996. Hong Kong roads are also some of the busiest in the world and carry some of the most expensive cars. The original harbour tunnel, which carries 120,000 vehicles per day will, on average, see one Mercedes Benz out of every six cars, one Jaguar in every 60 cars and one Rolls-Royce per 250 cars (representing the world's highest per capita ownership).

Apart from sustained growth in the economic development of Hong Kong over the next decade, Hong Kong has also approved two major projects for expansion requiring massive investment in infrastructure. These are part of the Port and Airport Development Strategy (PADS). The first is the development of a new airport which will span 10 different projects and build a base for economic expansion well into the next century. Apart from the airport itself this will involve six road and rail projects, two major land reclamations and the creation of a new town. The airport is scheduled to open the first of its runways in 1998 and will handle 35 million passengers and 1.5 million tonnes of air cargo yearly. Planned expansion will allow for 87 million passengers and nine million tonnes of cargo by the year 2040. The second project is the expansion of the port handling capacity by one million TEUs per year (the equivalent of building, every year, a port the size of Oakland, California or Felixstowe, Britain's biggest container port).

Hong Kong's present port has 15 berths with another seven to be built. The new project will involve the development of a completely new port with 17 berths initially and planned capacity of 24 berths in operation by 2011.

These new projects are not only some of the largest civil engineering projects in the world but will also involve major information systems development. The Master Systems Integration project planned for the airport offers a contract worth approximately HK\$8 billion. The system shown in Figure 1.1 presents a massive integration challenge to develop a database capable of interfacing with all the airport-related systems. In this way, all the separate islands of information such as the Flight Information Display Systems (FIDS), closed-circuit television, building management systems and trunk mobile radio will share access to the same information and the new airport authority will have control not only over the baggage handling system but also interface with all other airlines' systems.

MASTER SYSTEMS INTEGRATION

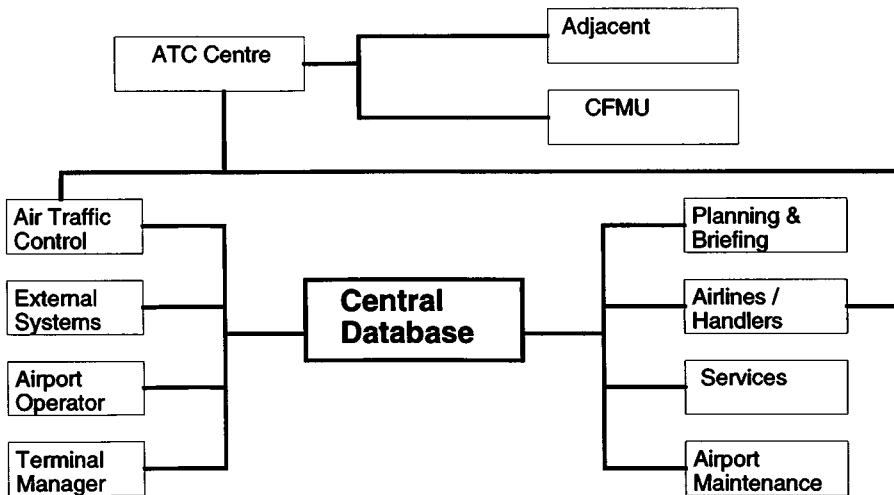


Figure 1.1 PADS Systems

Both of these developments are designed not only to benefit Hong Kong but also China, particularly developments in the south. However, given the completion dates it must be recognized that financing of the project may run into problems after the 1997 change of sovereignty and may also be challenged by separate developments in China such as the expansion of Shanghai's port which threatens Hong Kong's position as gateway to China. The planned expansion in China between 1996 and 2000 will include a new airport to accommodate 25 million passengers, major road and railway de-

velopments (including a tunnel beneath the Yangtze River) and the development of the metropolis as the major connection in China's international and domestic telecommunication network. This is only a small part of the ambitious upgrade planned in China over the next decade. Plans to virtually double the nation's power generation capacity by the year 2000 will cost between US\$65 billion and US\$200 billion, and a further US\$100 billion to provide 10 telephone lines for every 100 households. Equally large sums are required to build or upgrade 100 airports, develop expressways, railways and mass transit systems.

Hong Kong is still China's most important entrepôt for the majority of its trading partners including the US, the European Union and other Asian countries, but it is inevitable that, as China's infrastructure grows, exports will increasingly go from the country of origin directly to the country of consumption. As such, the level of re-exports through Hong Kong will naturally decline as China's port capacity improves, although at the same time the opening up of the China market will also stimulate trade and increase the need for provision of services. Hong Kong's history would suggest that an advanced infrastructure, special relationship with China, adaptability to change and a highly entrepreneurial work ethic would guarantee continued economic advancement and position the territory as a central hub not only for the Asia Pacific basin but also globally in the 21st century. There are a number of other factors, however, which must be considered when forecasting the development of Hong Kong into the next century. The first of these relates to Chinese sovereignty.

Political and Cultural Influences

The Confucian Connection

It is obvious that some societies have less difficulty absorbing new business methods and accepting new technologies than others. Reasons for this have been related to economic factors but also societal ones. Tung (1993) suggests that the economic factors include five components: stage of economic development, type of economic system, per capita GDP, home market demand and presence of a developed infrastructure. While this might satisfactorily explain the lack of development in the previously closed economies of China and Vietnam it does not totally support the development of the Four Dragons where economic systems and home demand are quite different.

Hofstede and Bond (1988) suggest that the differences in cultural values 'are ultimate determinants of human organization and behaviour and thus

of economic growth' and use five dimensions: uncertainty avoidance, individualism vs collectivism, masculinity vs femininity, power distance and Confucian dynamism. Based on statistical analysis, they found that the latter more than any other appears to account for and explain differences in economic growth around the world. These values are an intrinsic part of Asian life and emphasize persistence, perseverance and thrift. In addition there will be a high value on education and learning (included as part of the government programme in each of the Four Dragons). It would seem however, that the extent to which these values may apply have been modified by political and societal changes. In China some of these values were weakened by the Cultural Revolution of the 1960s and confusion rather than Confucius reigns. In Hong Kong a strong cultural identity has been maintained but it no longer favours tradition over progress. Nevertheless, a very strong achievement orientation remains along with high levels of family solidarity, respect for, and loyalty to, authority and overriding concerns for conflict avoidance. Proponents of Asian values (Bond, 1986, Hofstede, 1994, Tung, 1993) also speak of the emphasis in the region on collective as opposed to individual interests. The specific manifestations of collectivism are, however, very different. In China, it is based on the party and the state, and, often, has to be forced on the people by the central government. In Japan, the collective good tends to centre on the corporation and the family.

These aspects can all be found to varying degrees of intensity in the Asian success stories but there are as many differences as similarities in specific interpretations and practices: India with its caste system, Japan with a vast middle-class majority, Indonesia with a Muslim society and Thailand predominantly Buddhist. There has also been a trend to see modernization as 'Westernization' and a weakening of traditional values, resulting in the emergence of different patterns of economic and social development (for more detailed discussion of this see Chapter 9). Of particular interest is a merging of values such as will take place between Hong Kong and China and which is intended to be resolved by the 'One country two systems' concept.

One Country Two Systems

'Hong Kong is linked to China but, in another important sense, separate from it.'

— David Wilson, Governor of Hong Kong, 1989.

In 1984, the Sino-British Joint Declaration was signed in Beijing. Under this agreement Hong Kong reverted to China on 1 July 1997. Hong Kong

became a Special Administrative Region (SAR) of China and it was intended that it would retain a high degree of autonomy with the capitalist system and lifestyle guaranteed to remain unchanged for 50 years. Needless to say, the implementation of the 'one country, two systems' concept will not be easy. Interpretations of the general principles such as that embodied in Article 5 — 'The Hong Kong SAR safeguards the rights and freedom of the residents and other persons in the Region in accordance with law' — can be very different and this has given rise to much concern with regard to how the Basic Law may be implemented after 1997.

The differences between the two systems are not only political but cultural and economic, with vast disparities in technological advancement creating a 'communications' divide between the two regions.

Hong Kong has one of the most advanced telecommunications networks in the world with an all-digital telephony network and substantial deployment of optical fibre transmission to support a wide variety of voice, data and wideband applications. There are 2.8 million exchange lines and local calls are free. All other forms of communication are equally popular with the highest per capita use of cellular phones and pagers; the world's first mobile telephone network operative underground (for the tunnels and subway system) and use of communications for fax, voice and data of over two billion minutes in 1992 (a 50% increase over 1990).

Hongkong Telecom is now developing the basis of the information super highway with two programmes — the Advanced Fibre-optical Telecommunications Systems (AFT) and Super Business Infrastructure (SBI). Both use optical fibre technology and recent developments in customer access technology and represent a significant departure from the traditional approach for providing telecommunications (for a more detailed discussion see Chapter 3). This is reflective of growth in the Asian region. In the period 1993–6 the optical fibre capacity within the Asia Pacific region will have increased by a factor of 10 (15 billion bits) and the number of satellite transponders by a factor of five. Virtually every major country in the region will be serviced by three optical cable systems and for the first time optical diversity will be available to Europe and the US on both east and west routes.

China, on the other hand, is very far behind in its use of communications and computers even for basic business applications. This is partly due to the economic system but also reflects the COCOM (Coordination Committee on Multilateral Export Controls) agreements (abandoned in 1984) which limited the import of advanced computer technology into China. China is, however, undergoing a socio-economic revolution and appreciates that economic development will be closely linked to the widespread application of IT and the development of a nationwide IT infrastructure. As part of this development, the central government initiated the 'Three Golden Projects' in 1993. These comprise the 'Golden Bridge' which will be the

National Public Economic Information Communication Network, the 'Golden Custom' which aims to interconnect all the foreign trade enterprises' information systems and to exchange data using EDI, and the 'Golden Card' project which will build up a uniform card issuing system to realize national electronic currency flow. The scope of these three projects is enormous with the latter two relying on successful implementation of the superhighway implied by the 'Golden Bridge'. This network would have to link 500 central cities, 12,000 large- and medium-sized enterprises, including major projects such as the Daya Bay nuclear plant, as well as the networks of the banking and financial institutions being set up under the 'Golden Card' project. It is estimated that the whole backbone would include the use of 19 satellites, 3,600 kilometres of optical fibre cabling, and 34 million kilometres of microwave transmission — all fully integrated into one network system to provide the link to all other networks. This in a country where the commercial application of computers (mainly PCs) has a history of less than 10 years and few networks are in operation. Current estimates are one million PCs with growth rate estimates varying widely from 140,000 to 500,000 units yearly. These figures need to be considered against the population of approximately 1,112 million people (a ratio of 200:1 compared with Hong Kong). It has also recently become apparent that the cultural, social and economic values of China are at odds with those of Hong Kong with considerable disputes relating to the financial arrangements for the new airport, the awarding of contracts for a new container terminal and land reclamation projects. These disputes threaten to disrupt Hong Kong's economic stability and the development of crucial infrastructure projects. Without such development Hong Kong will certainly lose its competitive supremacy in Asia.

The Fire of the Dragons

The main competitive threat is posed by the other three Dragons — Singapore, Taiwan (ROC) and South Korea, and some of the other Asian countries which are now entering a period of rapid growth and development such as Thailand, India, Malaysia and the Philippines. Statistics related to their populations and GNP per head are shown in Table 1.3, and their share of world trade in Table 1.4.

Of all these countries, Hong Kong now has one of the highest labour costs and the highest land costs, suggesting that office and accommodation rental costs are among the highest in the world (*South China Morning Post*, April 1995). The average rental for accommodation was quoted as the world's highest at HK\$64,680 or approximately US\$9,000 in 1995, although that

Table 1.3
Population Comparisons

	<i>Million</i>	<i>GNP (per capita US\$)</i>
Hong Kong	5.9	13,430
Singapore	2.8	14,210
Taiwan	20.6	8,788
South Korea	43.3	6,330
China	1,149.5	370

Source: Far Eastern Economic Review Asia Year 1994.

Table 1.4
Share of World Trade

	<i>1992</i>	<i>1994</i>
South Korea	2.1%	2.1%
Singapore	1.7%	2.0%
Hong Kong	3.2%	3.6%
China	2.2%	2.5%

must be measured against the fact that more than 50% of the population in Hong Kong have government housing provision and Hong Kong has the world's largest government-funded housing project. As costs rise and infrastructure deteriorates Hong Kong's competitive advantage dwindles and major rivals such as Singapore are quick to exploit their advantage. The battle between Hong Kong and Singapore to run the world's busiest port has been ongoing over the last decade. While Hong Kong regained the title in 1992 after two years in which Singapore reigned (*Far Eastern Economic Review*, 1994), the difference in throughput between the two is so small that the balance can quickly shift in favour of the other.

Singapore has two distinct advantages over Hong Kong. Unlike Hong Kong, Singapore's economic growth has occurred with a very low inflation rate (1993 estimates of 2.5% compared to 9.5% in Hong Kong). Singapore is also showing higher growth rates when the other three Dragons are experiencing lower growth more in the pattern of 'mature' industrialized economies (MIEs) than NIEs. This may be a product of their 'golden triangle' policy where cheaper land and labour from Indonesia and Malaysia were used to underpin capital and skilled labour from Singapore. A second and more important factor is the interventionist policy of the Singapore government and the influence the government can bring to bear on the economy and free market operations. For example one policy decision in 1986 when Singapore was experiencing a recession was to reduce the wages of the workforce by 15% (Soh et al., 1993).

Nowhere can this influence be seen more strongly than in relation to computerization. The focus of the 1980 national development plan was 'informatization' with the establishment of the National Computer Board and the development of the first five-year plan, followed in 1985 by the second. The most recent plan, IT2000, developed in 1992, aims to turn Singapore into an 'intelligent island' (for more detailed discussion see Chapter 2). The success of such planning can be seen by Singapore's becoming the first country in Asia to have a nationwide EDI service in the form of TradeNet, established in 1989. Hong Kong, on the other hand, has been debating the issue of EDI since the early 1980s but due to lack of commitment from government and industry was still in a position where actual implementation had not taken place by 1996 (for more detailed discussion see Chapter 4).

Singapore has only recently realized the importance of developing an external economy and is now targeting China for aggressive expansion. One example is the decision to build an entire city near Suzhou (dubbed Singapore II) modelled on the 'Lion City', as Singapore is called. This is only the start: it will take 10 years to see whether Singapore can capitalize on the China market and the extent to which this may threaten Hong Kong. South Korea and Taiwan are the other two members of the 'Dragon club' and both have governments which have given strong support to building up an effective technology infrastructure, while also maintaining tight control over the economy. In South Korea, growth has been focused on the electronics industry as a whole. In 1970 South Korea sold US\$55 million worth of electronics to the world market and in 1992 that figure skyrocketed to US\$20.7 billion (over 6% of the world market) to become the world's third largest industry (Yoo, 1993). During the period from 1962-91 per capita GNP increased from US\$87 to US\$6,498 and gained South Korea its veritable membership of the Four Dragons. This growth came as a direct result of the South Korean government's decision in the mid-1960s to develop a solid technological base and includes extensive investment in telecommunications. Investment in telecommunications over the period 1978-90 as a measurement of GDP was 1.73 in Korea compared to 0.66 for OECD countries. With 13.5 million lines in its telecommunication network South Korea was also well-placed to introduce EDI. Its KTnet is now in the expansion stage and will be fully expanded in 1997 to cover the whole community.

Korea does, however, have specific problems on the political front with the possible unification of North and South seeming to move closer to reality after the collapse of communism in Eastern Europe in the late 1980s. Beset by major economic problems and with loss of Soviet-bloc patronage North Korea may well see unification as the only route to economic salvation although the impact on the South Korean economy and growth rate could be significant.

Taiwan also faces problems of a political nature but in the international arena. The ongoing dispute with China referred to as the Peoples' Republic of China (PRC) and Taiwan referred to as the Republic of China (ROC) has prevented Taiwan from playing an active role in world politics or international trade agreements. With no diplomatic relationships with any Asian country, 1993 saw its first participation (even only at observer level) in APEC. Like China, Taiwan is also seeking membership of the WTO. Relaxation of trading restrictions would offer a vast opportunity to Taiwan in China, with capital investment in the PRC flowing from the ROC estimated as high as US\$15 billion.

In the meantime Taiwan has put major efforts into the development of the information industry and in 1993 ranked the sixth largest IT product supplier in the worldwide computer market (Yun, 1993) and top in Asia. While this concentrates on hardware, the government has also recognized the need for software products to keep pace and launched a five-year information industry development programme in 1992. This will aggressively attack the whole information industry worldwide with a target of US\$28 billion in production value by the year 2000.

In support of the millions of export declarations made annually Taiwan has also developed an EDI system called Trade-van with initial implementation in 1992 and is now at the stage of integrating a number of other VAN services nationwide.

The 'Lions' Awake

Such proactive government intervention is not just confined to the NIEs. Developing economies in Asia have also embraced nationwide government informatization programmes. Thailand declared 1995 the 'Year of IT', with a three-point agenda:

1. invest in an equitable information infrastructure: to empower human ability and enhance life quality;
2. invest in people: build a literate populace and an adequate IT manpower base;
3. invest for good governance.

Part of the governing principle to be applied to all three points is to ensure the distribution of wealth to the rural regions. A similar programme is underway in the Philippines with the formation of the National IT Policy (NITP) 2000, with a vision of a SMART Philippines through information and computing empowerment for global competitiveness and people empowerment. The five targeted structural components are:

Telecommunications, Industry, Government, Education, Research (TIGER).

In Malaysia, developments are somewhat behind but again focusing on the development of an information-rich society in the context of Vision 2020. Within the context of this is the challenge of 'establishing a society that is innovative and forward looking, one that is not only a consumer of technology but also a contributor to the scientific and technological civilization of the future'.

As noted at the beginning of this chapter, the ASEAN bloc plus China and Taiwan are heralded as the 'emerging Asia', replacing Japan as the role model for the 21st century. Yet, if the conventional measures of markets are used, they jointly represent less than half the size of Japan in terms of GDP and less than one-third the size of the United States. When related to different purchasing powers the story is, however, very different. According to bankers J P Morgan (Heath, 1995), the total GDP of emerging Asia for 1994 was US\$6.7 trillion compared to America's US\$6.74 trillion and Japan's US\$2.67 trillion.

The members of emerging Asia have pursued a policy of reliance on each other where possible rather than dependency on the traditional mega-markets of East and West. In 1994 more than 35% of imports in the region were from a fellow Asian country (excluding Japan) and cross-border Asian investment from the NIEs is four times that of Japan and 10 times that of Japan in China. Japan has suffered from the effect of the rising Yen 'super endaka', as it is known. Rising costs have forced Japanese companies to move offshore and have led to a 'hollowing out' of Japanese industry. Firms which have relocated include Toshiba, Aiwa, Hitachi, NEC and Toyota. This in turn has led to an increase in Japanese investment to Southeast Asia, China and Hong Kong. Asian countries have also benefited from the appreciation of the Yen giving increased access to the Japanese market. In 1990, Hong Kong exports to Japan grew by 3.3%, in 1992 by 17.5% and in 1994 by 21.1%.

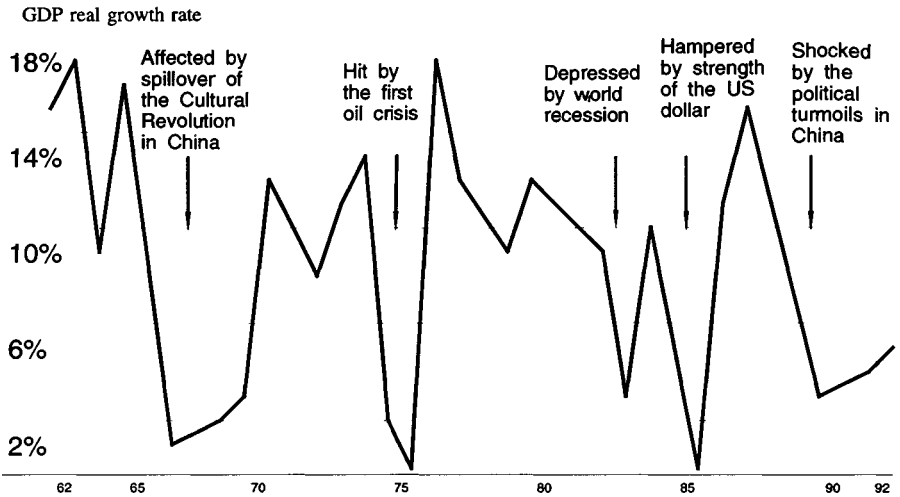
As Japanese dominance in Asia diminishes so emerging Asia will become a real force, and Hong Kong will yet again face the challenge of change — a challenge it is well qualified to meet.

Threats and Opportunities

Change as a Friend

Volatility has been a significant factor in the recent economic development of Hong Kong. Average GDP growth rates of 8% since the 1960s conceal a

pattern of turbulence. This is illustrated in Figure 1.2 for the 30-year period from 1962 to 1992, and demonstrates the sensitivity of a small economy in which home demand is almost irrelevant and external factors have shock effects. In order to secure the Hong Kong economy against such swings, positive efforts were made in the 1980s to develop a stronger international structure (unlike others in Asia). This may also be viewed as an effort to obtain not only economic but political independence from China.



Source: Booz-Allen & Hamilton analysis, Government statistics.

Figure 1.2 A Resilient Hong Kong Economy

The manufacturing and industrial sectors in Hong Kong have also faced many challenges. With the rising costs of land and labour they have outsourced much of their production not only to China but to Thailand, Indonesia, the Philippines and increasingly Vietnam (Redding, 1994). Hong Kong has been reluctant to compete against its more developed Asian competitors in areas of high-technology manufacturing. Rather it has retained its flexible and low-cost manufacturing by outsourcing. There has also been a consequent shift to servicing as the major economic sector with an emphasis on the supply of human expertise in management and development.

Internationalization has also led many multinationals to establish regional headquarters in Hong Kong with an increase from 174 in 1980 to 602 in 1991. These companies have brought with them international business practices which have helped to reshape the business culture in Hong Kong and created a more open society. They have also taken advantage of the communications infrastructure to develop strategic IT applications which

are now commonplace in the working environment in all sectors of industry and commerce. Such applications have taken longer to impact on the public sector but the government has given priority to IT developments within its own departments and these are now extending through the public sector into areas such as healthcare, police and education.

The Role of Information Technology

The development of a sound IT infrastructure is accepted as vital for national economic progress in the 21st century. With the exception of EDI, Hong Kong has one of the most advanced systems of telecommunications in place. As such, many companies employ the most sophisticated IT to provide on-line facilities for the whole population. This ranges through telephone banking systems, computer input terminals for betting, smartcards for a range of services and extended private EDI systems. As a result, it also has another advantage and that is a highly qualified and service-oriented labour force. It has been suggested that the vast undertaking of the 'Three Golden Projects' in China presents problems which are only 30% technological and 70% human factors (*IT Magazine*, September 1994). Hong Kong is well placed to supply that expertise and as the major investor in China, is already fully aware of their interdependence via a successful and rapid transition of China to a market-oriented model.

The lack of an effective IT infrastructure in China is being addressed with massive international investment in the drive for informatization. The estimate is US\$55 trillion — or, three years of the world's GNP (*Window Magazine*, 4 November 1994). This is obviously too great a commitment of the world's investment even with substantial guarantees from the Chinese government and will have to be scaled down substantially. Informatization may therefore be significantly slower than expectations. Experience in other NICs shows that countries can rapidly leapfrog stages of IT growth particularly when they can redesign the whole societal infrastructure to take advantage of such radical change. Normally developing countries would seek to improve basic needs such as housing, food and transportation first and only after that embark on more ambitious projects such as computerization.

In China, however, the government has recognized that provision of basic needs will have to move in parallel with the development of IT (*IT Magazine*, September 1994). For China's industry to develop there are two main problems which must first be solved: people and resistance to change, which are interrelated. There is a great lack of people in China with both IT and business skills and a need for people who can transfer their IT skills

into business strategies. The Ministry of Electronics Industry has publicly declared that there is a need for people with business process re-engineering skills to help users change working habits that are no longer efficient or effective in a modern Chinese economy. Hong Kong people have these skills and considerable experience of business change and sharing a common culture and the ability to overcome language barriers makes them ideally placed to spearhead the IT revolution. Chinese workers, however, fear the unemployment that could result from large-scale automation, while Chinese managers are reluctant to share their power. For the latter, information is a personal asset rather than a shared resource. The government is also aware of the problems which rapid informatization may carry with it and is attempting to manage controlled change. This could be said to be the new 'cultural revolution' although hopefully a peaceful one.

Turning Challenge into Opportunity

The World Bank's (1994) study of economic growth and public policy in the miracle economies of East Asia proposed four key elements as the basis for their success:

1. macroeconomic stability;
2. human capital formation;
3. openness to international trade;
4. an environment encouraging private investment and competition.

However, on closer examination of these factors Hong Kong has survived a highly volatile economy and there is no policy of government intervention either to stabilize the economy or to subsidize the development of certain critical industries. EDI is a case in point where the lack of government intervention has seriously inhibited development of a public highway (see Chapter 4 for an explanation of the private sector EDI). There has been a large investment in education but there is also an annual outflow of professional talent and high wages demanded by skilled labour have threatened the competitiveness of Hong Kong products (Burn and Ma, 1990). Nevertheless, Hong Kong has not only survived but thrived. Hong Kong is the most international of all Asian countries and perhaps one of the few truly international cities of the world. It is also highly competitive with a society strongly motivated to succeed and unafraid to invest capital in new enterprises or new opportunities such as those which China presents. The Asia Pacific region as a whole is undergoing enormous change and Hong Kong may be better prepared to cope with this than any of its competitors.

The challenge for Hong Kong is apparent and the following chapters

will discuss in greater detail some of the issues briefly highlighted here. Section 2 will examine ways in which Hong Kong is trying to leapfrog stages of IT growth through the application of more productive methods and the development of strategic systems. Finally, in Section 3 we take a closer look at some applications which are highly dependent on effective application of IT and provide leading-edge service. A number of chapters provide comparative studies with other Asian countries to emphasize the significant cultural differences which can exist even in a society which can be identified as 'Confucian' and the impact that may have on globalization in the next century.

References

General Sources

Asia Yearbook, Far Eastern Economic Review, 1994.

Basic Law of the Hong Kong Special Administrative Region of the People's Republic of China: Decree of the President of the PRC No 26, adopted by the Seventh National People's Congress, April 1990.

China Daily, 1994 editions.

Far Eastern Economic Review, 1994 editions.

Hong Kong Government. 1994. *Hong Kong Yearbook*. Hong Kong Government Information Services.

Hong Kong Government. 1991. *Hong Kong IT Environment*. Government Report for IT Committee.

Hong Kong Government. 1994. *Hong Kong Monthly Digest*. Hong Kong Government Information Services.

Hong Kong Government. 1994. *Hong Kong Trade Development Reports*.

IT Magazine (Hong Kong editions), March-September 1994.

South China Morning Post, 1994 editions.

Sunday Morning Post, 1994 editions.

Window magazine — Focus on China. Hong Kong, 1993-4 articles.

World Bank. 1993. *The East Asian Miracle*. New York.

Specific References

Bond, M.H., ed. 1986, *The Psychology of Chinese People*. Oxford University Press.

- Bond, M.H. 1991. *Beyond the Chinese Face*. Oxford University Press.
- Burn, J.M. and L. Ma. 1990. Computing careers in Hong Kong: short term solutions for long term problems. *Hong Kong Computer Journal* (May).
- Heath, R. 1995. Emerging Asia's inner energy. *Sunday Morning Post*, 23 July.
- Hofstede, G. 1994. *Cultures and Organisations*. Harper Collins.
- King, J.L., K.L. Kraemer, V. Gurbaxani and J. Dedrick. 1992. Government policy and information technology in Asia-Pacific countries: a conceptual overview. *Informatization and the Public Sector, Special Issue: Government Computerization Policy on the Pacific Rim* 2 (2): 97-110.
- Martinsons, M.G. 1993. Cultivating the strategic use of information technology: lessons from Hong Kong. *Technology Analysis and Strategic Management* 5 (2): 179-86.
- Redding, S.G. 1994. Competitive advantage in the context of Hong Kong. *Journal of Far Eastern Business* 1 (Autumn).
- Redding, G. and G. Wong. 1986. The psychology of Chinese organizational behaviour. In *The Psychology of Chinese People*, ed. Bond, M.H. Oxford University Press.
- Soh, C., B.S. Neo, M.L. Markus. 1993. IT2000: a critical appraisal of Singapore's state-wide strategic planning process for information technology. *Journal of Strategic Information Systems*.
- Tricker, R.I. 1991. Corporate governance: a ripple on the cultural reflection. In *Contracts in Capitalism*, ed. Redding. Berlin: de Gruyter.
- Tung, R. 1993. Human resources issues and the assimilation of foreign know-how. *Proceedings of Pacific Economic Co-operation Council, Technology Transfer Workshop* (November), Hong Kong.
- Yoo, Soo Hung. 1993. Leveraging technology for strategic advantage in the global market: case of the Korean electronics industry. *Proceedings of Pacific Economic Co-operation Council, Technology Transfer Workshop* (November), Hong Kong.
- Young, A.J. 1983. *China and Hong Kong: The Economic Nexus*. Hong Kong: Oxford University Press.
- Yun, Kuo. 1993. Achievements and future potentials of the information industry development in ROC. *Proceedings of Pan Pacific Conference on Information Systems*.

Section 2

Practices, Problems and Productivity in Hong Kong

An overview of the social and economic fabric which makes up the dynamic East Asia region was presented in the previous section, and Hong Kong was identified as an international business hub and a gateway for China trade and investment. This section provides a more detailed look at some of the practices and problems associated with the productive use of information technology in Hong Kong.

The first two chapters in this section were contributed by the team of Eugenia Tye and Patrick Chau. Chapter 5 flashes out some of the general themes mentioned in Section 1 to provide the reader with a sharper picture of the extent to which businesses make use of computer systems in Hong Kong. Given the extensive telecommunications infrastructure discussed in Chapters 3 and 4, it is perhaps a bit disappointing that computer-based information systems have not added more business value to the Hong Kong economy.

Chapter 6 hints at perhaps the largest bottleneck to realizing the technology potential. Like other rapidly developing economies, Hong Kong has experienced its share of human resource shortages. The situation has become particularly acute within the IT field as a result of the political and economic uncertainties related to the change of sovereignty in 1997. Large numbers of IT specialists emigrated from Hong Kong in the late 1980s and early 1990s. Meanwhile, many private businesses wanted to maximize profits in the years leading up to the handover, and therefore have been reluctant to make longer-term investments, such as training new staff. In this chapter, Tye and Chau identify the critical skills required in the IT field and the training programmes provided by the public sector, and profile the career prospects and job expectations of those in the IT field.

Chapters 7 and 8 address the issue of how IT applications in Hong Kong can be more effectively developed. In Chapter 7, Lee and Schmidt discuss both micro- and macro-level interventions to boost the productivity

of applications development. They also report that it is the macro-level methods, reforming the entire development life-cycle, that have significantly raised productivity.

In Chapter 8, Karimi and Chan present a survey of Computer Aided Software Engineering in Hong Kong. They note that only a small minority of Hong Kong firms are using CASE tools and that the overall CASE market is still at an immature stage. However, they have provided a solid road map for Hong Kong managers who want to use CASE tools, by identifying the potential benefits of these tools and also offering constructive ideas for overcoming several different types of implementation obstacles.

Chapter 9 considers the business process re-engineering phenomenon in the Hong Kong context. Martinsons discusses the potential role of IT as an enabler for radical process redesigns. He presents two case studies, of a bank and the Immigration Department, to demonstrate that re-engineering can be successfully applied in both the private and public sectors. However, he suggests that the predominant Confucian culture limits the applicability of radical initiatives, like re-engineering, in East Asia.

Section 3

Strategic Application and Exploitation of IT in Hong Kong

Section 2 looked at IT applications in Hong Kong from a macro perspective, but it ended with a preview of the way two organizations have implemented business process re-engineering. In Section 3, we continue to use our microscope to consider the way information technology is being applied at the organizational level. The particular organizations selected are all critically dependent on IT for strategic advantage and so show examples of IT in the world today.

In Chapter 10, the scene is set as Janice Burn reports on a study of over 200 Hong Kong organizations which examines the extent to which IT has been used strategically over the last six years. This general overview suggests that while there is a clear movement towards greater dependence on IT, few regard IT as more than a support for business strategy. The chapter does, however, provide some evidence to support the theory of leapfrog development using IT, with a discussion of the role of IT in the establishment of stock exchanges in China (a very recent phenomenon) and throughout East Asia. The application of IT in the development of the Hong Kong Stock Exchange provides an interesting contrast, suggesting that early IT investment can be an inhibitor of future innovation.

Chapter 11 and the four following chapters all describe specific case studies of successful IT innovation in Hong Kong organizations. Chapter 11 looks at the HongkongBank which has sustained a high level of investment in IT in order to maintain its industry leadership position, not only in Hong Kong but throughout the world. In this chapter, Maris Martinsons applies the competitive strategy models developed by Michael Porter to examine Hexagon — a global electronic banking system. This system benefits both the bank and its customers by effectively leveraging many of HongkongBank's traditional strengths.

By contrast, Chapter 12, authored by Steve Elliott, looks at the other side of banking in Hong Kong. He examines the strategic use of IT which

the smaller local banks have used to remain competitive in an industry which is dominated by three major players — the HongkongBank, the Standard & Chartered Bank, and the Bank of China group. Here the discussion centres on the collaborative use of IT as a collective strategic weapon — an example which may be applicable to many smaller organizations under threat from larger competitors.

In Chapter 13, Claudia Loebbecke and Robert Blanning consider one of the favourite leisure pursuits of Hong Kong society — horse racing. Despite the fact that the Hong Kong Jockey Club has a monopoly on legal gambling in the territory, it has worked very hard to develop and implement an innovative, secure and reliable computer-based system for administering all betting activities. This has led them into areas of IT innovation which offer opportunities outside the field of horse racing, with sophisticated customer input terminals which can be applied to several other industries, and smartcards which may challenge the other service industries, allowing goods and services outside betting to be obtained, and in the long term a situation where they may even challenge the banking community.

Sophisticated input devices are also the theme in Chapter 14, where Janice Burn examines one of the world's largest smartcard projects, under development by a Hong Kong transport consortium. Creative Star is a contactless card system which will come into full operation in 1997. The impacts on participating organizations and on Hong Kong society are reviewed using Venkatraman's model of business transformation. The implications are also examined in the context of proposed developments in China.

Finally, Chapter 15 presents an overview of one of Hong Kong's most successful industries — the container terminal operators. Hong Kong boasts the busiest container port in the world, but in one of the smallest physical areas. Janice Burn and Colonel Szeto look at the industry as a whole before examining the strategic use of IT by the container port operators to facilitate operations and gain competitive advantage. These companies also have global expansion programmes and they use IT to sell their services as port managers, with management of the UK's largest port already secured.

Index

- ASEAN 3, 21
- Asia 4
- Asia Pacific Region 3

- Bank of China 116, 274, 302, 306
- Bank of East Asia 274, 305, 307, 309
- banking 9, 268
- brain drain 36
- Britain 4, 5, 7
- Brunei 3
- business process re-engineering (BPR) 221, 222
- business strategies 256
- business transformation 262

- CASE 135
- cellular phones 12
- CETS 69, 107, 111
- Chekiang First Bank 197, 305
- China 3, 4
- Citibank 9, 270, 275, 290, 304
- communications hub 28
- Community Electronic Trading Service (CETs) 69, 97
- competitive advantage 300
- competitive forces 290
- Confucian 14, 25, 237
- container ports 28
- cultural values 14, 17
- Customer Input Terminals (CIT) 325

- data communications 42, 64, 66, 151, 349
- Database Management Systems 180, 330
- Decision Support Systems 7, 372, 374

- Dragons (Hong Kong, South Korea, Singpaore, Taiwan) 3, 4, 17, 63, 151, 251

- economic forum 33
- economic infrastructure 8
- economic policy 10
- electronic commerce 46, 91, 93
- electronic data interchange (EDI) 7, 11, 17, 19, 33, 44, 46, 51, 91, 92
- electronic document imaging 278
- EMV 341

- Features 212, 213
- Fortune 48

- gambling 7
- globalization 25
- Golden Bridge 16, 49, 105
- Golden Card 17, 49, 105, 352
- Golden Custom 17, 49, 105
- Golden Projects 113
- government IT policies 34, 37, 44

- Hang Seng Bank 274, 304, 306
- HEXAGON 70, 229
- HKSAR 48, 49
- HKTI 76
- Hong Kong 3, 5, 27
- Hong Kong economy 6, 22, 34
- Hong Kong government 41, 122, 137, 198
- Hong Kong Hospital Authority (HKHA) 252
- Hong Kong Industrial Technology Centre (HKITC) 39, 40, 47

- Hong Kong Industrial Technology Centre Corporation 198
 Hong Kong Jockey Club 7, 319
 Hong Kong Productivity Council (HKPC) 39, 40, 198
 Hong Kong Stock Exchange (HKSE) 71
 Hongkong International Terminals (HIT) 109
 Hongkong Telecom 12, 16, 70
 Hongkong Telecom International [HKTI] 73
 HongkongBank 7, 9, 70, 229, 252, 263, 267–296, 302, 304, 306, 344, 347, 353
- Immigration Department 233
 Immigration Record Information System (IRIS) 234
 India 3, 4, 7
 Indonesia 3, 4
 Industry and Technology Development Council (ITDC) 37
 information highway 62, 64
 information hub 81, 82
 information infrastructure 27, 28, 31
 initiatives 52
 ISO 9000 11
 IT education 38
 IT planning 32
 IT policies 27, 29, 35, 36
 IT professionals 154
 IT skills 158, 159, 162
 IT training 153
 IT2000 31, 32, 66
 ITDC 39
 ITSD 122
- Japan 3, 4, 63, 104
 JETCO 70
- Korea 5
 KTNNet 102, 112
- legislation 40
 Lions 3, 20, 251
 Liu Chong Hing Bank 307, 309
- Malaysia 3, 4, 7, 21, 104
 manpower 141, 142, 150
 mobile telecommunications 77, 78
 Mondex 341
 multinational companies 62
 multinational corporations (MNCs) 32, 45, 46, 48, 76
- National Computer Board (NCB) 30, 53, 152
 newly industrialized economies (NIEs) 3, 4, 20, 91
- Open Door Policy 6, 34
 organizational change 242
 organizational profiles 6
 organizational transformation 342
 outsourcing IT 9
- personal communication networks (PCN) 62
- Philippines 3, 4, 7, 20
 political and cultural influences 14
 Port and Airport Development Strategy (PADS) 12, 13
- satellite 16
 Shanghai 130
 Shanghai Commercial Bank 305
 Singapore 3, 7, 17, 27, 29, 31, 32, 65, 99, 123
 Sino-British Joint Declaration 10, 15, 34
 skills 161
 small and medium-sized business enterprises (SMEs) 91, 97, 98, 112, 117
 Smartcard 343
 South Korea 3, 7, 17, 65, 102, 123
 SSADM 198
 stock market 9
 strategic alignment 252
 strategic IT applications 254
 strategies 257
- Taiwan 3, 4, 7, 17, 66, 103

- Telebet System 330
- telecommunications 4, 29, 35, 61, 62, 72
- telecommunications infrastructure 33
- telecommunications networks 16
- tertiary educational institutions 148
- Thailand 3, 4, 7, 20
- Three Golden Projects 16, 23, 49, 105
- trade statistics 11
- Tradelink 12, 44, 69, 97, 106
- TradeNet 19, 33, 46, 92, 100, 112
- TradeVAN 103, 112
- value chain 286
- Vietnam 3, 4
- Vocational Training Council (VTC) 124, 148, 149
- Wing Lung Bank 305, 307, 309
- World Trade Organization (WTO) 10