

**CHALLENGE OF COMPETITION ON DOMINANT CARRIERS -  
A CASE OF SINGAPORE TELECOM**

by

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(1989)

SUBMITTED TO THE  
ALFRED P. SLOAN SCHOOL OF MANAGEMENT  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF

MASTER OF SCIENCE IN MANAGEMENT  
at the  
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1996

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JUN 14 1996

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## **ABSTRACT**

The worldwide trend in the telecommunications industry is deregulation and competition. The operating environment has undergone tremendous changes and Singapore Telecom faces greater competition both locally and internationally. It is critical for Singapore Telecom to prepare for the impending competition both at home and abroad.

This thesis reviews the history of Singapore Telecom and analyzes the competitive environment in which Singapore Telecom operates using Porter five-force model. In order to assess the effectiveness of Singapore Telecom's strategic thrusts, the thesis reviews the experiences of the dominant carriers of the United States (AT&T), United Kingdom (BT), Germany (Deutsche Bundespost Telekom), France (France Telecom) and Japan (NTT and KDD) and attempts to corroborate the strategic thrusts of these dominant carriers in their quests for sustainable superior performance in the face of greater competition. These strategic thrusts invariably fall into similar categories of restructuring; gobalization and strategic alliances; infrastructure modernization and development; cost rationalization and productivity improvement; continual service enhancement and new service provision; and finally research and development.

An attempt is made to describe the patterns seen in phases of the competition in the developed countries and the lessons which could be drawn. The critical success factors which are important for the dominant carriers to compete effectively in the industry are identified and described using the Value Chain framework.

Against this background, the strategies already adopted by Singapore Telecom are reviewed. It is seen that its strategies follow closely those of the other dominant carriers. The thesis wraps up with recommendations for improvement to existing strategies or new strategies which could be adopted by Singapore Telecom to position itself for superior performance.

Thesis Supervisor: Arnaldo C. Hax

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## ACKNOWLEDGMENTS

I would like to extend my heartfelt appreciation to my thesis supervisor, Professor Arnoldo C. Hax for his guidance and support during the course on this thesis drafting. He suggested a useful framework on which to present my points across to the readers succinctly as well as to make a focused analysis. Equally important, he was very encouraging to me by providing me with positive feedback, constructive comments and advice.

I am very grateful to Ms. Karen Low of the Telecommunication Authority of Singapore (TAS) for her assistance in providing me with reference materials regarding TAS's roles and policies. Special mention is due here to another staff in TAS, who requested for anonymity, for discussing with me some of the regulatory aspects pertaining to the licenses for cellular mobile and paging services.

Last but no least, I am indebted and very grateful to my wife, Kathy, for her love, understanding and patience as well as for looking after our two daughters, Jian Ni and Jian Hui in Singapore while I am away at MIT pursuing the Sloan Fellows Program.

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## 0. INTRODUCTION

### OVERVIEW

The focus of this thesis is on the strategic thrusts of Singapore Telecom in facing increasing competition in the telecommunications industry in Singapore and globally. Dominant carriers are defined as those which have a dominant share of the telecommunications market and usually are the incumbent monopolistic public telecommunications operators (PTOs) or administrations prior to liberalization. Using the experiences of dominant carriers in five developed countries, a common pattern of the liberalization and competitive changes can be discerned. Also, one will discover that the strategies adopted by these dominant carriers in the face of competition are quite similar<sup>1</sup>. But more importantly, the lessons to be learned should be noted by any dominant carriers in those countries which are starting off or are at the early stages of their telecommunications industry's liberalization and deregulation.

The similarity of the strategic thrusts is an assurance to Singapore Telecom's management that it is moving in the right direction. However, there is definitely room for improvement, no matter how meticulously planned or executed are its strategies. An attempt to recommend some improvements and new strategies is made in this thesis to enable Singapore Telecom to achieve sustainable superior performance.

### APPROACH OF STUDY

The perspective adopted in this thesis is from the strategic point of view. Accordingly, the political, economic, social and historical factors driving liberalization and deregulation are not emphasized but only referred to as background information. This thesis is structured into 10 chapters (including this introductory chapter) and their linkage is shown in Exhibit 0-1. A brief description of the chapters is as follow:

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<sup>1</sup> To prevent any misconceptions, there is no intention on my part to imply that Singapore Telecom learns its strategies from the five dominant carriers reviewed in this thesis. I believe Singapore Telecom, independently and also interactively with the dominant carriers and other entities, formulates its own strategies. My intention is to show that Singapore Telecom's strategies are on the right track.

## **1. The Telecommunications Industry in Singapore**

The history of Singapore Telecom, which was previously a government-owned monopoly, and how it has become a listed company (with the government still as majority shareholder) is described. The industry is increasingly being liberalized and in 1997, Singapore Telecom's mobile cellular and paging business will be subject to competition. Likewise in 2007, the telephone service will be open to competition.

Porter five-force model framework is used to scan the industry environment. In order to learn from the experience in the developed countries, the situation in five developed countries will be reviewed in the subsequent chapters.

## **2. The US Telecommunications Experience**

This is mainly a review of the AT&T breakup in 1984 and the strategic responses of AT&T towards the new competition. This review will act as a benchmark to identify the strategic thrusts adopted by dominant carriers in preparing to face greater competition.

## **3. The European Telecommunications Experience**

This is mainly a review of the developments in the European Union and the strategic responses by British Telecom, Deutsche Telekom and France Telecom towards increasing competition. This review will also act as a benchmark to identify the strategic thrusts necessary in the advent of greater competition.

## **4. The Japanese Telecommunications Experience**

Developments in Japan and the responses by NTT and KDD are reviewed. Similarly, this review will act as a benchmark to identify the strategic thrusts necessary to face greater competition.

## **5. Common Patterns of Competitive Changes and their Lessons**

An attempt is made to describe the common patterns seen in the telecommunication liberalization process and the competitive experiences of the dominant carriers in the developed countries. The review of the previous three chapters will act as reference. The trends, competitive changes and challenges are identified and lessons for dominant carriers in other countries going through or at

the start of the telecommunication liberalization process, especially for Singapore Telecom, are listed.

## **6. Critical Success Factors for Dominant Carriers**

Critical success factors which are important for the dominant carriers to compete effectively in the telecommunications industry are described. These factors are identified using Porter Value Chain as the framework. Examples of such factors include advanced technology, human resource expertise, corporate structure, etc.

## **7. Strategies of Singapore Telecom**

Strategies already adopted by Singapore Telecom are described, using Hax Strategic Management framework as a basis for presentation.

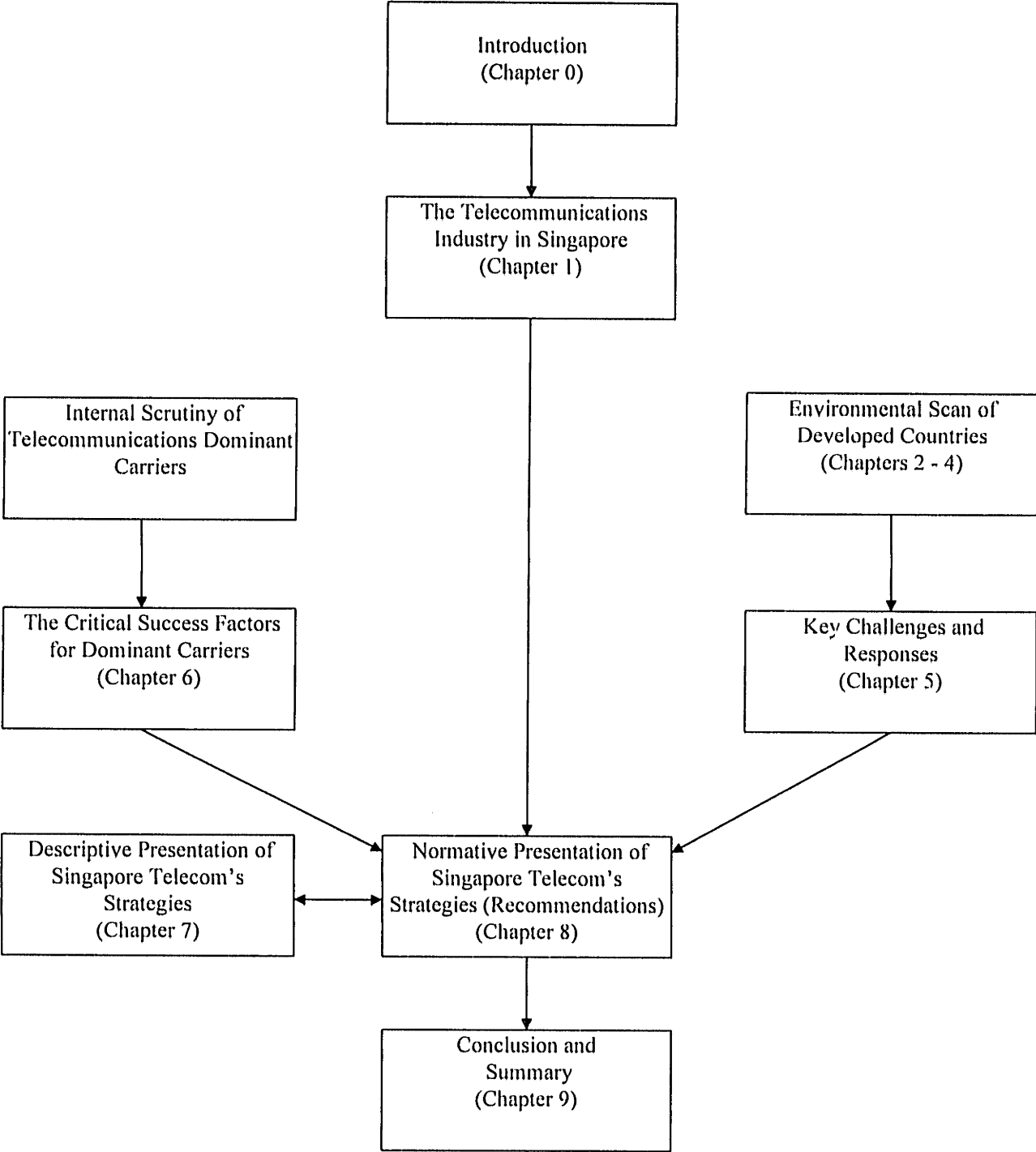
## **8. Improvement/New Strategies Recommendations**

The strategies of Singapore Telecom are analyzed for areas of improvement based on Hax framework on Positioning, Sustainability, Valuation and Flexibility of Strategic Management. An attempt is made to suggest improvements to existing strategies or new strategies which could be adopted by Singapore Telecom to position itself to achieve superior performance.

## **9. Conclusion**

The thesis concludes that Singapore Telecom is moving in the right direction in its strategy for sustainable superior performance. A summary of the recommendations is provided.

Exhibit 0-1: Linkage of Chapters in the Thesis.



## **IMPLICATIONS OF STUDY**

The thesis will have served its purpose if it could act as a preliminary reference for dominant carriers in countries starting or in the early phases of the liberalization and deregulation process. As for Singapore Telecom, the recommendations in this thesis could assist its management in further improvements.

An observant reader will note that in the strategic thrusts listed in this thesis, relationship management and influence (or lobbying) vis-à-vis the regulators have been omitted or mentioned in passing. As mentioned in one of the lessons learnt, fixation with the regulators is non-productive. Needless to say, a cordial relationship with the regulators is important. However, this is considered a pre-requisite and therefore it is purposely not included as one of the critical success factors.

## **1. THE TELECOMMUNICATIONS INDUSTRY IN SINGAPORE**

### **HISTORICAL BACKGROUND<sup>1</sup>**

In just three years after Alexandra Graham Bell patented his invention, the telephone was introduced in Singapore in 1879. The first private telephone exchange was a simple standard switchboard of 50 lines. In July 1882, the Oriental Telephone and Electric Company (OTEC) bought over the first private telephone exchange and set up its first public telephone exchange for 60 lines to provide telephone services in Singapore. In 1954, the Singapore government took over the telephone network. The Singapore Telephone Board was formed in 1955 to acquire the assets of OTEC. The Board was responsible for the provision of domestic telephone services while a separate entity, the Telecommunication Department, was responsible for international services.

The Telecommunication Department became a statutory body in 1972 and was renamed the Telecommunication Authority of Singapore (TAS). In 1974, the Singapore Telephone Board was merged into TAS. In 1982, the Postal Department was absorbed into TAS. TAS offered telecommunications and postal services as an operator, while at the same time acted as a regulatory body.

### **INCORPORATION OF SINGAPORE TELECOM**

On April 1, 1992, the operational aspect of TAS was corporatized as Singapore Telecommunications, or Singapore Telecom for short and a reconstituted TAS was formed as the regulator, standards setter, policy maker, developer and promoter of the telecommunications and postal industries under the TAS Act. Singapore Post, a subsidiary of Singapore Telecom, was to operate the postal services in Singapore. On October 1, 1993, Singapore Telecom became a public company after its successful initial public offer.

Singapore Telecom was granted the exclusive license to provide public mobile cellular telephone and paging services until end of March 1997. In addition, it was granted the exclusive license to provide domestic and international telephone

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<sup>1</sup> Source: Singapore Telecom's customers newsletter, Keylines, June 1990.

services until the year 2007. However, TAS's approach was to liberalize as widely as possible those services which were not the exclusive domain of Singapore Telecom.

## **ROLE OF TAS**

TAS is basically a telecommunications regulator and its mission is to ensure that Singapore's telecommunications and postal services, and infrastructure rank with the best in the world. Its objectives are<sup>2</sup>:

- charting the growth of services in Singapore;
- enhancing competition;
- protecting consumers; and
- setting standards.

Singapore aims for an orderly transition from a monopolistic structure to a competitive market environment. If competition is introduced too rapidly, there is risk that long term benefits may not be achieved. Market forces may force the operators to focus on short term profits rather than long term gains or national needs. TAS has to ensure that players are capable of growing and re-investing in new technologies over time. Only then can they contribute towards Singapore's competitive edge. TAS needs to create a level playing field for multiple players. It has formulated interconnection charging principles, transparent arbitration procedures and regular financial reporting mechanism by operators to prevent anti-competition practices.

The government views the global competition in telecommunications as an overwhelming and irreversible trend which cannot be altered nor stopped. To attempt to go against the trend would mean that Singapore could lose its competitive edge as a business and telecommunications hub. TAS is committed to a fully competitive and open market in the long run while taking into account the small size of the domestic market and the need to optimize the use of available resources. It would weigh better consumer choice against the added cost of duplication of services and facilities.

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<sup>2</sup> Source: TAS Annual Report, 1993/94.

## LIBERALIZATION

Even before the 1992 corporatization of Singapore Telecom and the reconstitution of TAS, the trend towards more liberalization of the telecommunications industry had started in Singapore. In January 1986, the government formed the Public Sector Divestment Committee charged with the task of formulating a program to divest government-linked companies (GLCs) as well as the privatization of statutory boards and to make recommendations on the implementation of the program. The reasons for privatization were to<sup>3</sup>:

- withdraw from commercial activities no longer needed to be undertaken by the public sector;
- broaden and deepen the Singapore stock market by introducing new counters and releasing more shares in existing counters; and
- avoid or reduce competition with the private sector.

The Committee noted that the reason for privatization of statutory boards was different. In fact, the privatization raised issues and potential problems which were not encountered in the privatization of GLCs. Unlike GLCs, the statutory boards were monopolies or near-monopolies providing essential services. Hence the Committee recommended a policy of privatization for GLCs where initiatives were decentralized and order was maintained through adequate monitoring, control and direction. However for statutory boards, further study and deliberation were necessary.<sup>4</sup> The Committee noted that privatization of statutory boards raised major issues such as:

- the potential conflict of interests between shareholders and consumers;
- foreign ownership versus local ownership of natural monopolies; and
- cross-subsidization.

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<sup>3</sup> Source: Report of the Public Sector Divestment Committee, February 21, 1987.

<sup>4</sup> Source: Ditto.



The Committee considered the privatization of seven statutory boards and recommended that only CAAS<sup>5</sup>, PSA<sup>6</sup>, PUB<sup>7</sup> and TAS be studied for privatization or liberalization.

Beginning in 1989, the sale and maintenance of customer premises equipment (CPE) were liberalized whereby the market was opened to private suppliers of CPE and subscribers were no longer restricted to Singapore Telecom for the installation of CPE. This meant that customers could select from a wider range of telecommunications products.

After the corporatization and public listing of Singapore Telecom, competition is being introduced at three levels<sup>8</sup>:

- TAS is liberalizing as widely as possible services which are clearly not exclusive to Singapore Telecom e.g., mobile data and private automatic branch exchange (PABX);
- For services currently exclusive to Singapore Telecom, TAS will introduce competition when exclusivity ends. The government would permit another cellular mobile operator and three more radio paging operators when Singapore Telecom's monopoly ends in April 1997. In 2002, TAS may also permit other operators to provide fixed telecommunication services as long as these services are not the core business of the service providers; and
- TAS has adopted a narrow definition of the scope of Singapore Telecom's exclusivity to pave the way for more competition. For example, it announced that it would permit more operators to provide satellite uplink and downlink services for broadcasting.

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<sup>5</sup> Civil Aviation Authority of Singapore whose principal activities are promotion of air services and aviation safety and management and development of Singapore's international airport, Changi Airport.

<sup>6</sup> Port of Singapore Authority whose principal activities are provision and maintenance of port services and facilities in Singapore.

<sup>7</sup> Public Utilities Board whose principal activities are provision of water, gas and electricity.

<sup>8</sup> Source: Speech by Mr. Mah Bow Tan, Minister of Communication, at license award ceremony for Public Mobile Data and Location Tracking Services, June 9, 1994, TAS's publication, VISTAS, June 1994.

The process of liberalization is being accelerated to ensure Singapore maintains and improves its position as both the telecommunications and commercial hub of the region.

## **RECENT INTRODUCTION OF COMPETITION**

In June, 1994, in a major step towards liberalization, TAS awarded a license to ST Mobile Data to run a network in competition with Singapore Telecom. ST Mobile Data is a joint venture between Singapore Technologies and BellSouth Mobile Data. This was the first time that TAS licensed an operator to provide an island-wide service in direct competition with Singapore Telecom. ST Mobile Data's new network was based on Ericsson's Mobitex and would offer such services as electronic mail, field service, transport and telemetry applications. The system was fully operational in early 1995. (Earlier, Singapore Telecom had launched DataRoam, the island first mobile data service which would support two way wireless data and text communication and would provide customers on the move with fast and efficient means of sending and retrieving information).

Since August 5, 1994, TAS had opened the 1900 audiotex service market to allow operators to provide audiotex services through the access code 1900 in Singapore. Accessed via the telephone by dialing a 1900 code, this VAN service provides quick and timely audio information on entertainment, sports and financial matters. Singapore Telecom and Singapore Press Holdings previously operated the services jointly on a trial basis to gauge public response and reaction to the service. As TAS was satisfied that the 1900 access audiotex service would benefit the consumers, it had decided to license interested parties to provide this service in Singapore.

To enable audiotex service operators to provide different and innovative packaging of information services at competitive prices to consumers, TAS has directed Singapore Telecom to give operators the flexibility to charge in blocks of six

seconds of usage after the first minute or in blocks of a minute. The following general conditions are to be met by audiotex service operators granted licenses<sup>9</sup>:

- call charges and other fees are made known to the users in a clear and unambiguous manner;
- the number of attempted calls to their services does not significantly exceed the number of call-in lines installed by the operators; and
- other standards in delivery of the audiotex program are kept, e.g., no delay in starting the program, no interruptions during the announcement or services and setting the minimum period of each call to 10 minutes with option for a caller to extend the call if he/she desires.

Parties keen to provide audiotex access services could apply for a license from TAS after obtaining clearance from the Ministry of Information and the Arts on the proposed content of their information services.

TAS liberalized the resale of telecommunications services by allowing the shared use of Private Automatic Branch Exchange services effective from August 1, 1994<sup>10</sup>. For an annual license fee of S\$1200, PABX service providers would be able to subcontract or share their PABX services with occupants in the same building. TAS had taken various measures to safeguard the interests of the shared PABX users e.g., PABX service providers had to comply with the terms and regulations stipulated in their licenses which included giving occupants a choice to use either Singapore Telecom's services such as PhoneNet or shared PABX services. They were also required to issue printed statements of accounts, listing separately all charges imposed by them and call charges levied by Singapore Telecom. The service providers were also solely responsible for the telecommunications services provided to the occupants and should report any faults to Singapore Telecom on occupants' behalf.

Shared use of PABX will benefit the businesses as not only will there be cost and space savings, but there will be better management of the telecommunications

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<sup>9</sup> Source: TAS publication, VISTAS, September, 1994.

<sup>10</sup> Source: TAS publication, VISTAS, September, 1994.

network and cabling within the building. Also there will be better utilization of allocated Direct in Dialing numbers as service providers are now able to resell spare capacity of extensions to other occupants within the same building.

Besides the resale of PABX services, TAS had liberalized the resale of public switched telecommunication services<sup>11</sup>. Companies would be able to buy telecommunications services from Singapore Telecom and resell them to other customers. Such services included telephone services, telegram, telex, facsimile, electronic mail, etc. This resale policy opened up competition of services currently under Singapore Telecom's exclusive license at the retail level. TAS believed that such a policy would lead to innovative variety of services to be made available to the general public as well as encourage better utilization of network capacity. In line with the resale policy, TAS had asked Singapore Telecom to develop a bulk discount scheme for resellers to facilitate the resale of telecommunication services from January 1, 1995. Under this scheme, any reseller who had an annual billing of S\$150,000 and above would enjoy discounts ranging from 2% to 8%.

TAS had issued a VAN license for the operation of facsimile service in hotels. The system, called InnFax, allows hotels to install facsimile machines in guest rooms by using the same telephone lines as room extensions thus doing away with rewiring and expansion of the PABX<sup>12</sup>. Further liberalization of VAN services from July 1995 would allow VAN-to-VAN interconnection via leased circuits. This would allow VAN operators to provide a wider range of services by having easy access to information databases. There are currently more than 52 VAN operators in Singapore providing international news and financial information, electronic mails, remote computing services etc.<sup>13</sup>

The Singapore government had laid the foundation for the emergence of a strong cable television operator which would compete with Singapore Telecom. In return Singapore Telecom would be given the opportunity to compete in multimedia

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<sup>11</sup> Source: VISTAS, Issue 1, 1995.

<sup>12</sup> Source: VISTAS, September 1993.

<sup>13</sup> Source: VISTAS, Issue 2, 1995.

services. A consortium called CableVision had been set up to invest in an island wide network. The partners were Singapore International Media, Singapore Technologies, Singapore Press Holding and Continental CableVision, the third largest cable television company in US. By excluding Singapore Telecom from CableVision, the government hoped that the two companies would eventually become full competitors in telephony, television and a host of information and multimedia services.

Prior to July 1994, Internet access in Singapore was fairly restricted usually to the domain of research and educational institutions. Although access could still be achieved by taking long distance route and dialing up to overseas Internet service providers, these methods tended to be expensive. However with the recent liberalization of Internet access through Singapore Telecom's SingNet service and that offered by Pacific Internet competing in the market, the general public had an easy and relatively cheap way to surf the Internet cyberspace. A third service provider, Cyberway would offer service in March 1996<sup>14</sup>.

In August 1994, TAS liberalized the licensing of satellite uplink/downlink operators. The aim of the liberalization was to establish Singapore as a regional broadcasting hub<sup>15</sup>. This could only be achieved by making Singapore a more attractive venue for foreign broadcasters to base their operations by providing them with a greater choice of uplink or downlink facilities. The number of licenses was not pre-determined but would depend upon the availability of suitable earth station sites and potential for frequency interference. The license for uplink/downlink services was for broadcast services only in order not to infringe on Singapore Telecom's license. Related to the liberalization of satellite uplink/downlink services was the liberalization of the use of Very Small Aperture Terminals (VSATs) for intra-corporate international leased circuit services. VSAT users are required to access satellites via space segments leased from Singapore Telecom which currently has exclusive rights to provide international leased circuit services in Singapore. In

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<sup>14</sup> Source: The Straits Times, Singapore, November 27, 1995.

<sup>15</sup> Source: VISTAS, September 1994.

applying for a VSAT license, companies must also certify that there is a policy of reciprocity by the foreign authorities for VSAT services.

In May 1995, TAS announced that MobileOne (Asia) Private Limited had won the tender for the license to provide public cellular mobile telephone services in Singapore and that three operators - MobileOne, ST Paging and Intrapage - were awarded the public radio paging licenses<sup>16</sup>. All these operators would launch their commercial services on April 1, 1997 when Singapore Telecom's exclusive rights for these services expire. These operators are consortia comprising local and foreign partners. For example, Cable & Wireless and Hong Kong Telecom are in MobileOne, Bellsouth Worldwide Holdings is in ST Paging, and Hutchison Telecommunications of Hong Kong is in IntraPage.

In November 1995, a second licensee was awarded the license by TAS to operate public trucked radio service in competition with Singapore Telecom's subsidiary Pagelink. The service allows users to share radio channels and is designed for group users such as bus or taxi fleet operators. The licensee was a consortium comprising ST Telecommunications and Sapura of Malaysia<sup>17</sup>.

After an initial period of ambivalence, TAS had announced that it would not ban call-back services in Singapore. Call-back service providers allow a client anywhere in the world to dial up a computer in US which within 30 seconds calls the customers back and connects them to their destinations via US lines. The savings are substantial as tough competition in US telephone companies as well as the bulk leasing of international lines by the service providers keeps international rates very low. In Singapore, at least a dozen call-back companies had sprung up over the past couple of years. Industry estimates put the annual growth rate of call-back service providers at 20-30% in Singapore.

## **STRINGENT SERVICE QUALITY STANDARDS**

TAS, being the regulator, had put great emphasis on the reliability and availability of the telecommunications network as service outages, especially major

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<sup>16</sup> Source: TAS's Press Release, May 8, 1995.

<sup>17</sup> Source: The Straits Times, Singapore, November 2, 1995.

ones, would disrupt the economic and social activities of the country and undermine Singapore's image as a business and telecommunications hub. When a major breakdown affecting over half of the country's telephone lines occurred in October 1994, TAS was very unhappy with Singapore Telecom and formed a review panel to investigate the cause of the breakdown and to come out with preventive measures against recurrence. Following the panel's recommendations, TAS proceeded to commission Bellcore as the consultant to audit Singapore Telecom's network and to recommend improvements to the design and management of the network to prevent a recurrence of such major network breakdown.

In July 1995, TAS introduced a penalty system for major breakdown in the fixed line telephone network and international direct dial services<sup>18</sup>. For domestic fixed line services, Singapore Telecom would incur a penalty of S\$5000 (US\$1 approximately equaled S\$1.40) if there was an outage of 10,000 lines or more in one telephone exchange for more than half an hour. The penalty would increase progressively depending on the duration and extent of the outage, subject to a cap of S\$500,000. Similar penalties would be imposed for total service disruption to an international direct dial destination countries. Singapore Telecom was expected to be more pro-active in preventing outages and improving the reliability of the network so that customers could be assured of quality telephone services.

To ensure that service quality would remain high, TAS had imposed a set of minimum standards for mobile service licensees to comply with. The standards had been deliberately set higher than the previous one applicable to Singapore Telecom. All licensees would be subject to the new standards by April 1, 1997. Consumers could look forward to better service such as low average call set-up time, etc. (see Exhibit 1-1). Thus, one sees that Singapore Telecom would not only face stiffer competition in the liberalized environment but would also expect to meet other regulatory requirements in such an environment.

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<sup>18</sup> Source: TAS Press Release, July 10, 1995.

<b>NEW STANDARDS FOR MOBILE SERVICES</b>	
Average set-up time for calls	Less than 5 seconds
Service activation time for dealers	Within 4 hours of applications
Success rate for public switched telephone network and mobile originated calls	Greater than 95%
Drop out rate	Less than 5%
Street coverage	
- on street level	Greater than 95%
- in-building coverage (central business district)	Greater than 85% for public access

Exhibit 1-1: New Standards for Mobile Services<sup>19</sup>.

In a related move to ensure continuance of high standards of telecommunications services in Singapore, TAS announced a tightening of regulations relating to the wiring of telecommunications equipment. From September 1995, only TAS registered telephone wiring contractors and installers would be allowed to carry out wiring work for complex equipment such as PABX, Key Telephone Systems, Intercom Telephone Systems and Voice Response Systems within their customers' premises. With the increasing demand for more complex wiring, registered contractors and installers have been required by TAS since March 1993 to attend and pass advanced courses which train them to carry out work in accordance with TAS code of practices for telephone wiring installations. This code defines the quality of wiring workmanship and practices. Suppliers and dealers who fail to engage TAS registered contractors for wiring complex equipment from September 1994 may risk having their licenses suspended or revoked<sup>20</sup>.

### **INDUSTRY ENVIRONMENTAL SCAN FOR SINGAPORE**

I would like to wrap up this chapter with an environmental scan of the telecommunications industry in Singapore using the Porter five-force model<sup>21</sup> with respect to Singapore Telecom. Porter's model is shown in Exhibit 1-2 with the arrows showing the interaction amongst the forces. The key players are new entrants, industry competitors, buyers, suppliers and substitutes.

<sup>19</sup> Source: TAS' publication, VISTAS, Issue 1, 1995.

<sup>20</sup> Source: VISTAS, September 1994.

<sup>21</sup> Source: Michael E. Porter, Competitive Advantage, 1985.



As the telecommunications industry encompasses many different service segments, differing detailed analysis should in fact be made on the different industry segments or strategic groupings which are groups of industry players having similar characteristics. However, in the following paragraphs, I give only a broad discussion on the overall telecommunications industry but provide a summary of the detailed analysis for the cellular mobile service industry as shown in Exhibits 1-3 and 1.4. (Note that the analysis on cellular mobile industry could differ from the analysis of the overall telecommunications industry).

### **Threat of New Entrants**

As seen above, the barriers to entry and government actions are against the interest of Singapore Telecom. It is the government's intention to liberalize the market and to encourage competition. New products and services are being developed and marketed to create new businesses that do not exist before. Thus they are not covered by Singapore Telecom's exclusive license and are open to competition. However, I do not foresee that the government will allow a free entry of carriers in the future for the domestic market although the number of VAN operators like Internet service providers allowed could be more than a handful. The reason is that Singapore is a small country state and the industry will suffer the law of diminishing returns if more than a handful of carriers are allowed to offer public switched or cellular mobile network services. Thus the number of licenses for mobile and paging services would be one and three respectively (not counting the license to Singapore Telecom) for a foreseeable period of time after TAS's commitment period of three years of operations in which TAS would not issue new licenses. As regards the domestic telephony network, a duopoly situation is most likely after 2007. However, because of the possibility of resale and competition from foreign carriers in terms of international calling cards or virtual private networks, the provision of international services, be they for telephony or data could see more than two players.

Except for the regulatory policies of the government, the barriers to entry are low as there are many well-financed companies in Singapore (some with

governmental links) eyeing the chance to offer telecommunications services. As seen earlier, they not only have the capital to invest in the expensive network, but they also have the means to form partnership or alliances with foreign experienced carriers for the technology.

As a dominant carrier, this factor is thus negative for Singapore Telecom.

### **Rivalry among Competitors**

Competition from MobileOne and the other two paging operators, come 1997, is expected to be intense. MobileOne has expertise from Hong Kong which is reputed to have an advanced mobile cellular and paging network. Mobile cellular and paging services are among the top revenue generating streams of Singapore Telecom and it has been bracing itself for the upcoming competition.

Although Singapore Telecom has till 2007 before worrying about competition for its telephony and international services, it has been facing competition from foreign carriers all along for the MNC business services and other new services offered by foreign carriers e.g. international calling card services. International Direct Dial is the top revenue stream for Singapore Telecom and actions to brace for such competition have been undertaken.

Another interesting aspect is the expectation of TAS that Singapore Telecom assists its competitors by sharing its infrastructure with the competitors e.g., radio towers and providing interconnection and access to its public telephone network. In fact Singapore Telecom and Singapore CableVision would share Singapore Telecom's optical fiber trunk lines under the streets of Singapore but they would compete by offering services through their respective lines. The interconnection and access charges for mobile cellular and paging were fixed by TAS for the first three years of competition and the economic compensation would be mutually agreed upon after that period with TAS as the arbitrator.

In addition to domestic rivalry, Singapore Telecom also faces international as well as domestic competitors in its globalization drive in countries which are opening up their markets to foreigners e.g., in India, Indonesia, Belgium and Ireland.

As regards barriers to exit, I see the main barrier as the terms and conditions of the license issued by TAS. For example, the license for the mobile cellular (and paging) operators stipulated that the license would be valid for twenty years (ten years) commencing April 1, 1997 and renewable thereafter subject to such terms and conditions specified by TAS. No transfer of the license is allowed except with prior approval of TAS. The licensees were guaranteed that no further licenses would be issued within the three year period from April 1, 1997. If the operators cease operation before March 31, 2000, their deposits would be forfeited. They are also required to pay an annual license fee of a certain percentage of their gross turnover subject to a minimum fee<sup>22</sup>. Thus barrier to exit is definitely not low.

As a dominant carrier, this factor is therefore against Singapore Telecom.

### **Power of Buyers**

With competition, the power of customers would be strong especially since the switching cost involved is minimal. With TAS's desire for number portability as its goal, there would be no inconvenience for customers who change operators since their existing numbers could be used when they transfer to a different operator's network. Customers will be able to shop around for services which offer better value for money. The challenge facing Singapore Telecom is the prevention of its services from becoming commoditized. Thus this factor is to the disadvantage of Singapore Telecom.

### **Power of Suppliers**

Suppliers of telecommunication equipment know that carriers are wary of them if they are at the same time telecommunication operators. As doing this has the potential of competing against their customers, they usually would refrain from forward integration. The recent splitting up of AT&T is a case in point where a reason put forward for the splitting up was for the equipment corporation to achieve its full fledged potential with carrier customers. At the same time, Singapore Telecom has experienced no problem to attract tenderers offering attractive bids

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<sup>22</sup> Source: TAS tender documents for cellular mobile and paging licenses.

both economically and technologically all this while as the competition amongst the suppliers is also intense. Thus this factor is attractive to Singapore Telecom.

### **Threat of Substitutes**

This factor is attractive to Singapore Telecom as telecommunications is widely acknowledged to be a sine qua non for the future information age which will be the engine of growth for the national economies of modern nations.

### **Overall Evaluation**

Notwithstanding the threat of rivalry from existing and potential competition, the telecommunications industry in Singapore is a lucrative one for Singapore Telecom especially since it is Singapore's goal to be the financial, broadcasting, telecommunications and information hub in the region. As long as the internal competitive factors of Singapore Telecom are focused on best serving the customers, not just domestically but also globally, the growth potential for Singapore Telecom is bright.

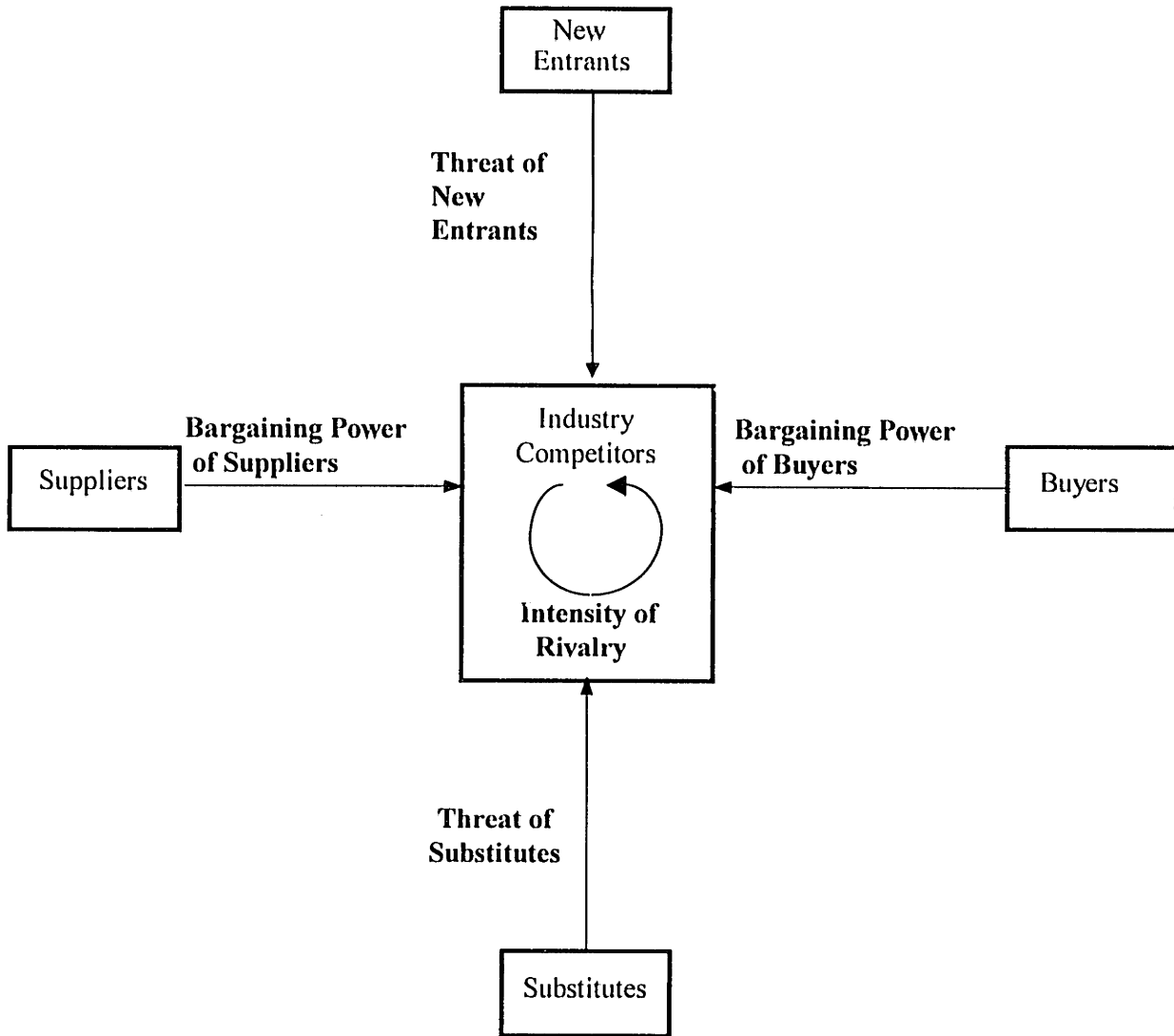


Exhibit 1-2: Industry Structure: Porter Five-Force Model.

Exhibit 1-3: Cellular Mobile Industry Analysis.

		LE	H U	M U	N T	M A	H A	RE
Barriers to Entry	Economies of scales Product differentiation Licensing barrier Switching cost Access to distribution channels Capital requirements Access to latest technology Experience effect	Small Little Low Low Ample Low Ample Unimportant						Large Big High High Restricted High Restricted Important
Barriers to Exit	Asset specialization One time cost of exit Strategic interrelationship Emotional barriers Government/social restrictions	High High High High High						Low Low Low Low Low
Government Actions	Industry protection Industry regulation Consistency of policies Foreign ownership Assistance provided to competitors	Low Unfavorable Low Unrestricted Substantial						High Favorable High Restricted None
Rivalry among Competitors	Number of equally balanced competitors Industry growth Fixed cost Product features Capacity increases Strategic stakes	Large Fast High Commodity Little High						Small Slow Low Specialty Large Low
Power of Buyers	Number of important buyers Availability of substitutes Buyer switching cost Buyers' threat of backward integration Industry threat of forward integration Value to customers	Few Many Low High Low Small						Many Few High Low High Big
Power of Suppliers	Number of important suppliers Availability of substitutes Supplier switching cost Suppliers' threat of forward integration Industry threat of backward integration Value to industry	Few Low High High Low High						Many High Low Low High Low
Substitutes	Availability of close substitutes User switching cost Substitute producers' aggressiveness Substitute value	Large Low High High						Little High Low Low

Note: LE: Left end extreme    HU: Highly unattractive    MU: Mildly unattractive    NT: Neutral  
 MA: Mildly attractive    HA: Highly attractive    RE: Right end extreme

	Industry Attractiveness		
	Low	Medium	High
Barriers to entry		x	
Barriers to exit	x		
Government actions			x
Rivalry among competitors	x		
Power of buyers		x	
Power of suppliers		x	
Substitutes			x
Overall assessment			x

Exhibit 1-4: Summary of the Cellular Mobile Industry Environmental Scan.

## 2. THE US TELECOMMUNICATIONS EXPERIENCE

### **HISTORICAL BACKGROUND<sup>1</sup>**

Until the end of World War II, US telecommunications policy was based upon the premise that telecommunications systems were natural monopolies. When the Federal Communications Commission (FCC) came into existence, it found in existence a long established private monopoly, the American Telephone and Telegraph Company (AT&T) which dominated US telephone service. It was vertically integrated with Western Electric, its manufacturing arm and Bell Laboratories, its research and development arm, and both were well established in their respective sectors. It was thus offering an end to end service including the equipment to be attached to the telephone lines.

Today, the US system has drastically changed. The policy thrust is to rely upon competition and deregulation. In a series of decisions (the 1956 Hushaphone decision, the 1968 Carterphone decision and the 1977 Certification ruling), the FCC opened customer premises equipment (CPE) to all providers who met the technical requirements. In 1980, in the Computer Inquiry II decision, the FCC deregulated the CPE business.

Value added networks (VANs) enhance communication systems through data processing techniques. The FCC in its 1971 Computer Inquiry I decision sought to regulate carriers supplying such services if the transmission predominated the enhanced element. Such differentiation was difficult in light of technology and in its 1980 Computer Inquiry II decision, it deregulated the VAN services. Furthermore in its 1986 Computer Inquiry III ruling, it sought to promote such services provided by the divested Bell Operating Companies (BOCs).

New technology such as microwave and satellite made competition feasible in the long haul communications. In 1959, the FCC allowed large users to construct their own microwave networks to meet their own long-distance telecommunications needs. In 1969, the FCC authorized the first competing toll carrier, MCI, to provide

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<sup>1</sup> Source: US Telecommunications Policy; Increasing Competition and Deregulation, Henry Geller, Restructuring and Managing the Telecommunications Sector, A World Bank Symposium, November 17-19, 1987.



private line services for large users and in 1971, it permitted other common carriers to enter the market. In 1972, it adopted an open skies policy for domestic common carrier satellite operations, permitting all financially and technically qualified parties to launch private line satellite services. The FCC thought it was confining competition to only private line service and thus would not undermine the basic message toll service. However, competitors maneuvered to enter the message toll service, whose endeavors were sustained by court rulings. In 1979 - 1980, the entire long haul toll business was opened to competition.

During the 1970s, AT&T waged all-out war against the new Other Common Carriers (OCCs) via price reduction and administrative or court challenges. It took advantage of its control of the local exchange facilities which the OCCs needed to complete their toll calls. AT&T refused interconnection to the OCCs or delayed such service or offered inferior interconnection. As a result of these, the US Department of Justice instituted an antitrust suit in 1974 against AT&T and in 1982 obtained the relief it sought - the divestiture of the BOCs.

## **LIBERALIZATION**

With the advent of full toll competition, the FCC moved to wring subsidies out of the toll system. Local rates thus went up gradually with toll rates coming down correspondingly. The FCC also did not regulate the rates charged by the OCCs because they had no market power (e.g. MCI and Sprint). However, AT&T's rate was subject to regulation only until recently in 1995. FCC agreed to free AT&T from price regulation of residential subscribers, in exchange for commitments from the company to protect rates for low-income customers and people in remote rural areas<sup>2</sup>. The FCC said that the justification for such protections had disappeared, given that AT&T now faced intense competition throughout the long-distance industry and no longer had monopoly power to set prices. AT&T is obliged to provide several special discount services for low-volume customers for at least three years. This followed the move earlier in the year when the FCC lifted heavy

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<sup>2</sup> Source: The Boston Globe, October 13, 1995.

regulations on AT&T's long-distance service to small businesses, allowing the company to set rates as quickly as competitors<sup>3</sup>. Under the streamlined regulation, proposed rate changes by AT&T may take effect within 14 days of filing a plan with the FCC. The streamlined regulation is used by MCI, Sprint and others.

Short haul toll or intra-local area transport and access (LATA) toll presents a different picture. There is virtually no competition to the Local Exchange Carriers (LECs). There are legal barriers to entry and even if entry is allowed, there is lack of equal access. An LEC could charge its rivals more for access than its own end-to-end toll charges. When AT&T divested itself of the BOCs in 1984 to settle the anti-trust suit, AT&T was banned from providing local telephone services and value added services. But the company's problem is that competition is expected to increase sharply before the end of the decade. Legislation moving rapidly through Congress would enable the regional BOCs, each of which has enormous financial resources, to enter the long-distance market within three years. The US government intends to rewrite the nation's communications laws to make it much easier for the seven regional Bell companies to enter the long-distance market. On February 8, 1996, President Clinton signed into law the telecommunications bill which removed regulatory barriers that currently prevented the local telephone, long-distance and cable television companies from entering each other's markets<sup>4</sup>.

Even before the bill becomes law, in some states, long-distance carriers are allowed to enter part of the local market. In 1994, New Jersey, California and other states have allowed long-distance carriers into short-haul long-distance calls. These calls go beyond a local calling area but stay within a local company's operating territory<sup>5</sup>. Such calls used to be the sole preserve of the seven Baby Bells as well as some smaller independents.

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<sup>3</sup> Source: ProQuest - The New York Times (R) Ondisc, Jan 13, 1995.

<sup>4</sup> Source: The Wall Street Journal, February 9, 1996.

<sup>5</sup> Source: ProQuest - The New York Times (R) Ondisc, April 24, 1995.

## **AT&T's MISSION**

AT&T's mission can be seen from its annual report:

“We are dedicated to being the world's best at bringing people together - giving them easy access to each other and to the information and services they want and need - anytime, anywhere.”

In order to achieve the above goals, AT&T stated its basic corporate strategies in its 1991 Annual Report as:

- to firmly establish AT&T as a truly global company;
- to strengthen and build on leadership in core business; and
- to become the world leader in the area of network computing where technologies of computers and telecommunications converge.

## **AT&T STRATEGIES**

I would like to describe in some details the strategic thrusts undertaken by AT&T. The lists in each strategic thrust are in no way exhaustive but they would give the reader a feeling of what AT&T has been working on.

### **Restructuring**

In 1988, AT&T moved to a multi-divisional corporate organization with strategic business units (SBUs) serving each major market segment. The purpose was to implement delegation and to give a framework of autonomy and a sense of responsibility to each SBU. In 1991, in order to promote the globalization of its business, AT&T merged its international services unit into the Customer Business Services in order to erase the border between domestic and international communication services.

In 1993, after the retirement of vice chairman and CEO of AT&T International, AT&T formed the Global Operations Team charged with accelerating the carrier's globalization effort<sup>6</sup>. The main role of the Team was to coordinate its international business among the SBUs. To place more emphasis on the multimedia

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<sup>6</sup> Source: Globalization Strategies of Telecommunications Companies - Comparative Analysis of AT&T, BT and NTT, MIT Sloan thesis by Noboru Tamura, 1994.

business, the former Communication Product was renamed AT&T Multimedia Products and Services.

However, none of these reorganizations could match in scope and scale the latest restructuring recently announced in September 1995 - the split-up of AT&T into three independent companies; an AT&T built around its telephone and cellular services, a telephone equipment maker and a computer supplier. The move was to address the fierce competition in every segment of AT&T's business that was expected to become more intense when Congress followed through on plans to deregulate the telephone and cable television industries.

Under the familiar AT&T brand name, the services company would consist of AT&T's current Communications Services Group, AT&T Universal Card Services Corporation, the newly established AT&T Solutions consulting and integration organization and AT&T Wireless Services. The company also plans to create an AT&T Laboratories unit around the core of Bell Laboratories people dedicated to research and development in telecommunications services.

The product and system business would include AT&T Network Systems Group, Global Business Communications Systems, Consumer Products, AT&T Paradyne and Microelectronics. (The new company has been named Lucent Technologies in a Securities and Exchange filing for its initial public offering in the Spring of 1996<sup>7</sup>). AT&T Global Information Solutions, the company's computer unit would be launched as an independent company probably under the resumed former name: NCR. In addition, AT&T plans to sell its remaining interest in AT&T Capital Corporation to the general public.

AT&T's decision to break itself up could help its ambitions to expand around the world. As its operations outside the US expand, AT&T has increasingly found itself in the awkward position of being both a supplier of equipment and a feared competitor in the long-distance business. By voluntarily breaking itself up, AT&T intends to liberate its equipment and network construction division as it tries to sell

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<sup>7</sup> Source: USA Today, February 6, 1996.

to rivals in Asia or Europe. Already, within the United States, the conflict between AT&T's role as a major equipment supplier and as a giant telephone company has generated tension between AT&T and the regional BOCs. The resulting tension has helped erode AT&T's share of the market for giant network switching systems, as many BOCs have been seeking alternative vendors.

### **Globalization/Strategic Alliance**

Competition has also extended itself from the domestic arena to the global market. AT&T faces stiffer competition from big global alliances. MCI has teamed up with British Telecom, and Sprint has teamed up with France Telecom and Deutsche Telekom to provide global networking services to big corporate customers. In January 1993, AT&T reached an agreement with Unitel to acquire 20% share in exchange for rights to AT&T's intelligent network technology and to access the technical research and development of AT&T Bell Laboratories. The alliance was important for both companies in providing seamless services to the US companies with subsidiaries in Canada and vice versa<sup>8</sup>. To offer one-stop shopping for telecommunications services to companies that do business globally, AT&T formed World Partners with KDD of Japan and Singapore Telecom in May 1993.

AT&T has teamed up with the telephone companies of Switzerland, Sweden and the Netherlands to provide advanced communication services to multinational corporations<sup>9</sup>. AT&T-backed consortium, World Partners, would link up with Unisource, a consortium owned by the telephone companies of Switzerland, Sweden and the Netherlands. Unisource will also invest an undisclosed sum in World Partners.

AT&T announced plans to enter into a US\$1 billion alliance with a Mexican partner, Grupo Industrial Alfa S.A., that would provide long-distance telephone service when the present Government-approved monopoly ends in 1997<sup>10</sup>. AT&T and Alfa said that over the next four to six years, they were prepared to invest

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<sup>8</sup> Source: ProQuest - The New York Times (R) Ondisc, January 8, 1993.

<sup>9</sup> Source: ProQuest - The New York Times (R) Ondisc, June 24, 1994.

<sup>10</sup> Source: ProQuest - The New York Times (R) Ondisc, November 10, 1994.

US\$1 billion to create a network that would compete with Telmex of Mexico in long-distance service. Alfa would own 51% of the new venture, and AT&T the remaining 49 %. Long-distance service in Mexico is seen as a lucrative market with great potential for growth as the Mexican economy expands under the North American Free Trade Agreement.

AT&T had clinched a deal with Saudi Arabia to modernize its entire telecommunications system. The Saudi Ministry of Posts and Telecommunications signed a letter of intent awarding AT&T the job of modernizing the entire telephone network with fiber optics, advanced switching systems and a nationwide cellular telephone system<sup>11</sup>. Under the terms of the deal, AT&T would build a digital telephone network with 1.5 million lines, and supply the extensive switching equipment, network management systems and training projects that the network would require. AT&T would also build a cellular telephone system capable of serving 200,000 customers across the country. The entire project was scheduled to be completed by the year 2000.

AT&T and Silicon Graphics Inc. formed an alliance, called Interactive Digital Solutions, aimed at developing and marketing networks that delivered interactive television and on-line computer services to homes. The new alliance brings together two powerful suppliers in the race between telephone and cable television companies to build multimedia networks. The two companies hoped to combine their respective technologies in computers and high-speed switching and to market turnkey systems that could deliver movies on demand, interactive home-shopping services and video games over telephone or cable television networks. AT&T would contribute its expertise in the high-speed switching technology known as Asynchronous Transfer Mode (ATM), which enables a network to simultaneously carry voice, video and computer data<sup>12</sup>.

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<sup>11</sup> Source: ProQuest - The New York Times (R) Ondisc, May 10, 1994.

<sup>12</sup> Source: ProQuest - The New York Times (R) Ondisc, June 23, 1994.

Plans for a joint venture to provide an on-line communications service in Japan were announced by Sony Corporation, NTT and AT&T<sup>13</sup>. It would offer subscribers the ability to exchange messages, including handwritten or typewritten text, drawings, animation, or voice messages through ordinary telephone connections. Text and graphics can also be transmitted by facsimile. During the trial, the service would be enhanced to include news reports, entertainment listings, business listings and subscriber bulletin boards. The network would use software based on Magic Cap software, developed by General Magic Inc., a software venture in which all the partners were involved.

AT&T, Intel and Lotus Development announced that they had formed an alliance to provide integrated conferencing products and services<sup>14</sup>. The development will link AT&T Worldworx Network Services, AT&T Network Notes, Intel Proshare Personal Conferencing, Lotus Notes and Lotus Video Notes across computer networks and standard phone lines. Trials had been scheduled with delivery planned in 1996.

AT&T and Intel announced that they had agreed to work together to deliver interactive services to personal computers<sup>15</sup>. The services would allow consumers to gain access to on-line information, electronic banking and shopping, personal financial services, games and the Internet over their personal computers. Under their agreement, AT&T Network Systems and Intel would offer a package of network and customer equipment for cable television and local telephone companies, creating a set of two-way, interactive PC services that they could deliver over their current and planned telecommunications networks. Intel would provide its Cable Port adapter technology while AT&T Network Systems would provide broadband networks and network integration.

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<sup>13</sup> Source: ProQuest - The New York Times (R) Ondisc, August 1, 1995.

<sup>14</sup> Source: ProQuest - The New York Times (R) Ondisc, April 19, 1995.

<sup>15</sup> Source: ProQuest - The New York Times (R) Ondisc, May 5, 1995.

## **Merger and Acquisition**

The convergence of telecommunication technology with the computer and television technologies to offer multimedia services had induced AT&T to enter into the computer business through the acquisition of NCR. However, its foray into the computer industry had not been profitable.

On August 16, 1993, AT&T and McCaw entered into a definitive agreement for the merger of McCaw and a subsidiary of AT&T, making McCaw a wholly owned subsidiary of AT&T. The deal was completed in September 1994<sup>16</sup>. The move puts AT&T in direct competition with the regional Bell companies since McCaw is the dominant player in wireless services in most major metropolitan areas. AT&T's acquisition of McCaw gave it a head start over rivals, including Bell Atlantic, Nynex and the other regional BOCs, in the competition to dominate the cellular market in the US. Through McCaw, AT&T gained access to a huge customer base as well as to the local telephone market from which it had been excluded since the 1984 breakup of the Bell System.

## **Infrastructure Modernization/Development**

Continuous infrastructure investments were carried out to support its telecommunications services, to cater for traffic growth, modernization and enhanced reliability. AT&T planned to make substantial investments to enhance and expand its cellular network. It also had an ambitious plan to build a global satellite communication service that would allow it to bypass local phone companies. Its plan would use twelve high orbit satellites and would cost billions of dollars if FCC approved it and the plan carried out.

## **Cost Reduction/Rationalization/Productivity Improvement**

### Downsizing

AT&T has cut more than 70,000 jobs in the dozen years since 1984. While many of the reductions were through voluntary departures, with some workers being offered up to two years in wages as severance pay, involuntary layoffs were

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<sup>16</sup> Source: ProQuest - The New York Times (R) Ondisc, August 17, 1993 and November 8, 1994.



also involved. It had been announced that AT&T would be cutting 40,000 jobs in its breakup into three separate companies. A process has been designed in which employees have to submit their resumes for rating of the employees' skills and abilities by the supervisors. Those who survive a roundtable meeting of senior executives in the employees' department facilitated by an external consultant would be assigned to their jobs. Those who are unassigned would have their services terminated with a severance package. To mitigate the impact on those leaving, the company offered access to resource centers where they could get counseling, use of office space and equipment and access to database of job postings in other companies<sup>17</sup>.

#### Introduction of New and Cost Effective Technology

By relying on automation and computerized network technology, fewer maintenance people, telephone operators and middle managers are needed. AT&T announced in August 1993 that technological advances would allow it to lay off up to a quarter of its operators between April 1994 and early 1995. AT&T said 3,000 to 4,000 of its 17,000 operators could lose their jobs, although many would be offered other positions. The cuts followed the closing of 31 operator offices in 21 states that began in March 1992<sup>18</sup>. AT&T attributed the cuts to its adoption of computers that recognized voice commands. The speech-recognition system would handle what used to be operator-assisted calls. If the system did not recognize the answer, a live operator then came on-line. In addition, a caller could reach a live operator any time, simply by saying 'operator'.

To enhance productivity, AT&T had 47,000 employees engaged in the telecommuting program, working from home and from virtual offices of laptops and cellular phones. In 1994, the company saved US\$80 million in consolidated office space as a result<sup>19</sup>.

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<sup>17</sup> Source: The New York Times, February 13, 1996.

<sup>18</sup> Source: ProQuest - The New York Times (R) Ondisc, August 19, 1993.

<sup>19</sup> Source: The Straits Times, Singapore, November 1, 1995.

## Foreign Direct Investment

The shifting of AT&T's manufacturing operations overseas either through joint ventures or on its own to exploit cheaper wages and operational expenses had also increased AT&T's productivity. It has many such overseas facilities all over the world e.g., in Asia Pacific, Latin America and Europe.

## Involvement in Decision-making

In March 1993, 1,000 members of the AT&T work force, gathered at a conference center in New Jersey to discuss the topic on 'Workplace of the Future', a company-union initiative instigated by a clause in the 1992 contract calling for labor participation in business strategy decisions. The merit of this involvement is AT&T's commitment to employment security, education and training or retraining. The workplace of the future will have four components: workplace model strategies for promoting change; business unit/division planning councils to improve customer satisfaction; the constructive relationship council that will review contract-related issues; and a human resources board whose scope will include external issues like health care that have an impact on AT&T employees<sup>20</sup>.

## **Continual Service Enhancement/New Service Provision**

Multimedia networks will lead to new ways of communicating and computing and in education and entertainment. The recent trend for network outsourcing by multinational companies to reduce overhead cost and not be burdened by the need for mastering new technologies such as frame-relay and SMDS (Switched Multimegabit Data Service) transmission creates a niche which AT&T has seized. The new services on long-distance credit cards and calling cards are some recent examples which AT&T has introduced.

AT&T would market advanced video and data services to business customers under the name AT&T Worldworx Solutions<sup>21</sup>. AT&T said that in the first quarter of 1995, the long-distance network would be modified so people could make video and data calls to other companies regardless of the personal computers they had.

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<sup>20</sup> Source: ProQuest - The New York Times (R) Ondisc, March 14, 1993.

<sup>21</sup> Source: ProQuest - The New York Times (R) Ondisc, June 16, 1994.

AT&T would offer consumers a bank-at-home system that operates on television screens. The service, called AT&T Checkfree, would allow consumers to pay bills electronically by entering commands onto a video program that appears on the television when they establish a link with the Checkfree Corporation, a software and electronics company based in Columbus, Ohio, an AT&T partner in the venture<sup>22</sup>. To make payments, consumers would first give bank account information to Checkfree and tell the company what merchants they want to pay to. Then consumers would dial Checkfree and initiate payments after moving through a series of menus on the television screen. Checkfree would move payments between a consumer's bank account and the merchants. Consumers could make payments on credit cards, telephone and other bills.

AT&T had discounted a wide variety of calls made in the United States, including long-distance service over regular and cellular phones and service using calling cards through the True Reach Savings program in August 1995<sup>23</sup>. Under the plan, customers who spend US\$25 or more a month on a variety of long-distance services in the United States get a 25% discount. Customers who spend US\$10 to US\$25 a month receive a 10% discount. The discounts apply to domestic long-distance calls, cellular long-distance calls, directory assistance, conference calls, operator-assisted calls, calling card calls and True Connections 500 service.

AT&T announced plans to offer access to the Internet, saying that it wanted to make on-line services as common and as easy to use as the telephone. The company, which has 80 million telephone customers worldwide, said it intended to offer Internet services ranging from secure business transactions to electronic mail, voice and video conferencing, and wireless access<sup>24</sup>. The company is creating three units to offer Internet services. Of those, AT&T Worldnet Services will be responsible for offering business and residential customers access to the Internet through dedicated networks, dial-up telephone services, and wireless

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<sup>22</sup> Source: ProQuest - The New York Times (R) Ondisc, June 7, 1995.

<sup>23</sup> Source: ProQuest - The New York Times (R) Ondisc, August 22, 1995.

<sup>24</sup> Source: ProQuest - The New York Times (R) Ondisc, August 16, 1995.

communications. Another unit, Hosting and Transactions Services, will help AT&T's (800) business customers develop electronic storefronts and services on the Internet's World Wide Web. The third unit will develop the contents for Worldnet.

### **Research and Development**

AT&T Bell Laboratories provide support to all business units. They design and develop new products and systems. Areas of the research and development work in recent years include lightwave transmission, electronic switching technology and microelectronics components. They also undertake the architectural effort required to see that AT&T products can be integrated within a framework of national and international standards. They have also made significant contributions to the efficient coding of television pictures and to wireless communications technology.

In order to increase focus on customers and to create more nimble organizations, much of the AT&T Bell Laboratories' systems engineering and development resource has been more formally aligned with business units. The newly aligned organizations remain AT&T Bell Laboratories, but they receive day-to-day guidance from the business units they support. Scientists at AT&T Bell Laboratories would be expected to produce incremental improvements in existing products rather than be involved in large programs of long term basic research<sup>25</sup>. This is a rational response to changes in the technology where the computer and telecommunications business is fast-moving, highly competitive, and increasingly dominated by companies that are narrowly focused.

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<sup>25</sup> Source: The New York Times (R) Ondisc, September 26, 1995.

### 3. THE EUROPEAN TELECOMMUNICATIONS EXPERIENCE

#### INTRODUCTION

In the following sections, I would like to review the telecommunications situation in United Kingdom, Germany and France and how the respective dominant carriers responded to the changing environment domestically as well as to the developments in the European Union.

#### IMPACT OF EUROPEAN UNION<sup>1</sup>

The European Union (EU) has set a timetable for deregulation of telecommunications services in Europe. By January 1, 1998, the majority of member states are expected to have dismantled the telecommunications monopolies in their countries, allowing new entrants to compete with existing Public Telecommunications Operators (PTOs) in public and voice services.

Since the mid 1980s, the European Commission had introduced a series of directives aimed at liberalizing the telecommunications market. Many companies see telecommunications liberalization as paramount to the completion of the Single European Market, allowing a reduction of business costs and an improvement in the range of services available. Moreover, a liberalized telecommunications market will allow European industry to compete more effectively with the global players.

For PTOs, income from voice telephony is growing slowly and the growth in returns is set to decline as line take-up falls off and competition from mobile and other services heats up. Privatizations are being planned or debated in Belgium, Denmark, Germany, Greece, Italy, the Netherlands and Portugal. The Spanish and Italian PTOs are already listed on their country's stock exchange. In Germany, Belgium, France and Norway, PTOs form autonomous entities within the state.

Telecommunications companies are expected to link up with cable television operators to grab a share of the home entertainment market. The EU is studying the impact of the multimedia revolution and in particular, the much publicized Information Superhighway.

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<sup>1</sup> For more information, readers are referred to European Communications - Technologies and Regulations of the Single Market, edited by David Shorrocks, Dotesios Printers, 1989.

A complement to liberalization was the harmonization framework as seen in the 1987 Green Paper which ensured open access to network resources and services still provided under restrictive monopoly arrangement. At the same time, the framework would harmonize the methods and conditions of access to remove barriers to pan-European supply of services and equipment.

The Open Network Provision (ONP) Framework Directive in 1990 established the need for harmonized conditions of access to public networks and services regarding technical interfaces, usage conditions and tariff principles. The Directive set a timetable for action, identifying the need for specific ONP directives and recommendations pertaining to leased lines, integrated services digital network (ISDN) and public switched data services.

The opening to competition was initiated by the 1990 Services Directive (90/388/EEC) which provided for the removal of special and exclusive rights granted by member states for the supply of value added and data services. The Directive also liberalized voice services other than those provided for the general public. It required the separation of operational and regulatory functions in order to encourage competition. This has now been achieved in most member states through the formation of regulatory departments and operational entities.

The 1993 Council Resolution set a timetable for the development of telecommunications and confirmed the date of January 1, 1998 for the liberalization of voice telephony services for the general public. In 1994, the Council adopted a further resolution confirming the same date for the liberalization of telecommunications infrastructure<sup>2</sup>. The EU has also issued directives relating to the liberalization of cable television and mobile markets by 1996.

The EU's approval for the formation of alliances is needed to ensure fair competition. For example, the EU Competition Commissioner Karel Van Miert, Deutsche Telekom Chairman Ron Sommer, and France Telecom Chairman Michel

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<sup>2</sup> Source: Communication by the Commission to the European Parliament and the Council on the Status and Implementation of Directive 90/388/EEC, Brussels, April 4, 1995, COM(95) 113 final,

Bon achieved agreement on the conditions for the approval of the Atlas and Phoenix (Global One) joint ventures. The meeting included French Telecommunications Minister F. Fillon and a representative of the German Telecommunications Minister, who affirmed their government's commitments to get parliamentary approval to liberalize alternative networks in Germany and France no later than July 1, 1996<sup>3</sup>. In addition to the planned liberalization of alternative networks by July 1, 1996, agreement in principle was reached on key points one of which was that the parties would be allowed to merge their domestic public-switched data services, Datex-P (Germany) and Transpac (France), into the Atlas venture on January 1, 1998.

## **UNITED KINGDOM (UK)**

### **Historical Background<sup>4</sup>**

British Telecommunications, BT, was incorporated on April 1, 1984 as a public limited company wholly-owned by the UK government. In December 1984, the UK government sold about 50% of the shares to the public in a worldwide offering and in December 1991, sold a further 25.6%. In July 1993, the government sold substantially all of its remaining holding of BT's shares.

BT is the dominant carrier in the UK. Its main services are local and long-distance telephone calls, the provision of telephone exchange lines to homes and businesses, international telephone calls and the supply of telecommunication customer premises equipment (CPE). BT also offers a range of other products and services, including private circuits and mobile communication services and products.

### **UK Regulation<sup>5</sup>**

BT operates in the UK in a growing competitive and extensive regulatory environment. The growing number of providers of telecommunication services is creating an increasingly competitive market. The prices of services are controlled by

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<sup>3</sup> Source: Deutsche Telecom/ France Telecom Press Release, October 18, 1995.

<sup>4</sup> Source: BT Annual Report on Form 20F filing to SEC, 1994.

<sup>5</sup> Source: ditto.

a license granted by the UK Secretary of State for Trade and Industry after consultation with the UK Director General of Telecommunications who has broad supervisory powers and duties under the UK Telecommunications Act 1984,

The Director General has concurrent jurisdiction with the Director of the UK Office of Fair Trading (OFT) in exercising certain functions under the UK Fair Trading Act 1973 and under the UK Competition Act 1980, but only when they relate to telecommunications. The Director General is supported by the UK Office of Telecommunications (OFTEL).

BT is required to provide universal service throughout nearly all parts of the UK. It has to connect to its system any other systems of other licensees satisfying specified approved standards. It has to comply with a variety of fair trading obligations such as prohibition on showing unfair preference or discrimination in the provision of services and favoring any part of its own business against competitors; and prohibition on cross subsidy, imposing linked sales on customers and exclusive dealing arrangements on suppliers.

The license contains price control formulae which essentially reduce the extent to which BT can increase the prices of its services. BT is required to publish and adhere to standard tariffs and other terms for providing services, to make a uniform charge for the installation and maintenance of exchange lines for premises served by a single line. No other competing operators are subject to price controls.

#### **Liberalization/Competition<sup>6</sup>**

Since 1981, the UK government had followed a policy of introducing competition into the building and operation of public telecommunication networks, the provision of services over those networks and the supply of telecommunication equipment. From the time Mercury Communications Limited, a subsidiary of Cable & Wireless started services, BT had been faced with direct competition in the provision of switched voice telephony and data services. The duopoly policy in place from 1983 until 1991 allowed only BT and Mercury to provide fixed link

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<sup>6</sup> Source: BT Annual Report on Form 20F filing to SEC, 1994.



telecommunication services to the public. Since 1991, the UK government stated it would consider applications from any applicants for licenses to offer fixed link local and long-distance telecommunication services. It also allowed cable television companies to provide local fixed link services. The UK government also decided to end the duopoly policy with respect to international operators.

Up to 1994, there had been some 90 applications for new telecommunication licenses where some 55 of which had been granted. Applications had covered a variety of activities, including local, long-distance and international telephony and international simple resale. None of the new licenses has the same universal service obligation or fair trading conditions as the BT license and even where the licensee is a public telecommunication operator, the regulation of the licensee's activities is limited until the licensee achieved a 25% market share.

BT is restricted from competing in the provision of cable television services over its nationwide public network. BT is not allowed by its license to convey television programs for simultaneous reception in more than one home, although conveyance to business premises is permitted. The government does not intend to remove this restriction until 2001. However even if the license restriction is lifted there is still a constraint in that the government only permits one cable television operator to provide services in each franchise area, in effect providing a local cable television monopoly. The government had announced that BT would not be allowed to provide television delivery services nationally until 2001 at the earliest. Cable television operators are however allowed to link adjacent franchises to provide telecommunication services over a wider area, and may apply for licenses to run linking circuits between non-adjacent franchises. However, BT is not prohibited from providing on demand services where videos, television programs and interactive multimedia services are sent to individual customers on request.

US and Canadian telephone and cable television companies are substantial investors in many UK cable television operators. Some 125 cable television franchises had been awarded, covering two thirds of the UK population, and the operators were allowed to offer voice telephony services on an integrated basis with

their entertainment services. In 1994, telecommunication services were being offered in about 45 franchises.

BT is restricted from competing in the provision of mobile telecommunication services in the UK although BT has a majority share in Cellnet. It was excluded from participating in the consortia licensed in July 1991 to operate personal communication networks (PCNs) which would compete with existing mobile network using a different set of radio frequencies as well as the fixed networks. The government has also licensed the two cellular telephone operators, Vodafone and Cellnet, and the two new PCN operators to provide fixed link services in addition to their mobile operations while continuing to exclude BT from providing mobile services.

### **BT Strategies**

BT would emphasize on the increasing use of its network while taking steps to control its operating expenses without sacrificing the quality of services to its customers. Major investment in the network would continue and BT is using technology to improve existing services and developing new ones. In particular, BT would develop mobile services and managed network services for multinational business customers.

BT currently derives a major portion of its revenue domestically but believes that there will be great scope for BT to develop its business in overseas markets. BT will continue to explore opportunities as they arise for significant acquisition, joint ventures and other alliances.

### **Restructuring**

In order to support the current strategies, BT implemented a restructuring plan called Project Sovereign in 1990. In this reorganization, BT combined the domestic and international overseas network units into the Worldwide Networks Division. BT also formed the Personal Communications and Business Communications Divisions. These changes did away with the boundaries between domestic and international services in view of the globalization direction.

## Globalization

Since 1989, BT had attempted to access the US market through its acquisitions of Dialcom and Tymnet. The US market was BT's first priority in its globalization strategy simply because of the concentration of multinational corporations in US as well as the fact that US was the earliest country to liberalize its telecommunications industry.

Syncordia was the first network outsourcing company in the world to replace internal networks of multinational corporations (MNCs). Because the customer target was MNCs in the US, BT chose to establish Syncordia in Atlanta in 1991<sup>7</sup>. BT tried to get partners to join Syncordia but was unsuccessful, the main reasons of which was governmental regulations. Although Syncordia boasted of many benefits to MNC users, it was not successful due to inability to get partners as well as keen competition from US firms like EDS which had better competitive advantages.

## Strategic Alliance

BT also entered into joint ventures and strategic alliances around the world. BT and MCI, the second largest carrier of long-distance telecommunications services in US, had agreed to form a strategic alliance which involve creating Concert Communications and the acquisition by BT of a 20% stake in MCI at about US\$4.3 billion together with the purchase by MCI of most of the assets and operations of BT North America Inc. The deal was completed in January 1994<sup>8</sup>.

The creation of Concert enables BT and MCI to combine their international enhanced voice and data services and into which Syncordia has been merged. These services include international network services, frame-relay, flexible bandwidth, outsourcing and MCI's virtual private network services. MCI acts as exclusive distributor for the North, South and Central Americas and the Caribbean while BT acts as exclusive distributor for the rest of the world although each of them would be able to make passive sales in each other's territory on customers' requests.

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<sup>7</sup> Source: Telecommunications Reports, September 23, 1991.

<sup>8</sup> Source: BT Annual Report on Form 20F filing to SEC, 1994.

BT joined forces with the German industrial group, VIAG, in May 1995 to offer telecommunications services in Germany. Viag InterKom KG had been launched in Munich<sup>9</sup>. Both parties have 37.5% of the new venture with the remaining 25% taken up by other German partners. Viag InterKom is offering data communications, corporate voice, virtual private networks as well as international voice and data services from Concert. The company also offers management and outsourcing services. This is the first phase of the strategic plan for the joint venture company which will seek a license in Germany to offer a full range of telecommunications services, including public voice. Initial investment in the venture would be DM 1.2 billion over ten years, with a considerable increase in investment should the venture be given a full license to provide services.

BT, Tele Danmark and the Norwegian operator Telenor announced in May 1995 that they had launched a new telecommunications operator, Telenordia, in the Swedish market<sup>10</sup>. Telenordia is owned equally by BT, Tele Danmark and Telenor and aims to become the leading alternative telecommunications operator in Sweden. It will invest about £200 million by the end of the decade of which approximately half will be in switches and network capacity. Full regulatory clearance from the European Union has already been given, and the joint venture requires no further legal clearance from European or Swedish authorities.

#### Infrastructure Modernization/Development

BT had engaged in an extensive program of modernizing, improving and expanding its telecommunications network. BT continued to install local digital telephone exchanges to replace electro-mechanical and semi-electronic exchanges. The installation of digital switching and associated transmission equipment throughout UK long-distance network was completed in 1991. In addition, major capital projects included the construction of Cellnet's new digital cellular system and the installation of computer systems for BT's advanced billing and other services.

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<sup>9</sup> Source: BT Press Release, May 3, 1995.

<sup>10</sup> Source: BT Press Release, May 4, 1995.

In July 1995, BT announced that Digital Equipment and Alcatel would work jointly with BT to develop a detailed design for its next generation of intelligent network (IN), called CORNICHE<sup>11</sup>. The new network will be based on the Telecommunications Information Networking Architecture (TINA) model. IN uses large computers attached to switches to provide advanced telecommunications services, such as customized billing, calling charge cards, rerouting based upon time of day and other advanced services. Increased flexibility and intelligence in the network will allow users a greater degree of customization and control and enable BT to offer more complex packages of services.

#### Cost Reduction/Rationalization/Productivity Improvement

To survive in an increasingly competitive environment, BT has to promote efficient operation and to provide better value to customers. It launched a program called Release 92 which was a special early voluntary retirement program for some 24,000 employees. In the first quarter of 1995, staff costs were 9.8% lower, reflecting in particular the fewer managers now employed. BT continues to improve its efficiency and the numbers employed in the group fell by 11,200 to 144,800 people<sup>12</sup>.

#### Continual Service Enhancement/New Service Provision

Concert is introducing the next generation of global voice and data features to augment its current portfolio of communications services<sup>13</sup>. These include the world's first virtual private network (VPN) based global audioconferencing service, a new VPN calling card, a suite of services targeting electronic commerce and messaging applications and expanded global data services.

Other ways of improving services to customers are the reduction and streamlining in tariff. In March 1995, BT cut up to 30% off the connection charge where several exchange lines were ordered for installation at the same address at the same time<sup>14</sup>. The permanent price cut applied to residential customers as well

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<sup>11</sup> Source: BT Press Release July 20, 1995.

<sup>12</sup> Source: BT Press Release, February 9, 1995.

<sup>13</sup> Source: BT Press Release, October 3, 1995.

<sup>14</sup> Source: BT Press Release, February 27, 1995.

as businesses, and to private payphone lines. BT was able to offer the discounts because of the savings it made in processing all the orders together and making all the installations on a single appointment.

BT changed its entire network over to per second pricing by abolishing unit-based charging for all its customers<sup>15</sup>. Most calls will either come down in price or cost the same. While some calls of specific duration might cost slightly more, call charges would come down by £310 million in total and the average call bill would come down by 5%.

BT launched Campusworld - the world's largest on-line network providing a dedicated service for education in September, 1995<sup>16</sup>. By accessing the Internet through CampusWorld, educationalists at all levels will be able to find what they need quickly and easily, saving time and money. The service is the only on-line network to provide in-depth curriculum support and a range of resources put together by a large team of teachers and consultants in the UK and Europe. A key element of the service is the ability of members to network on projects. Schools from around the world, for example, can get involved in debates about a wide range of subjects, often involving specialist comments from recognized experts in the field.

#### Research and Development

BT had started recruiting customers for BT Interactive TV, its market trial of interactive multimedia services. The trial would involved about 2,500 customers in Colchester and Ipswich<sup>17</sup>. All customers would be recruited by market research to allow BT to achieve a representative demographic sample of the UK population, and a wide range of data would be collected about them before service was to be connected.

BT Interactive TV will consist of nine main services: movies on demand; television programming on demand; children's television; education; music videos; local life; and High Street, which incorporates home shopping and home banking. In

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<sup>15</sup> Source: BT Press Release, May 31, 1995.

<sup>16</sup> Source: BT Press Release, September 8, 1995.

<sup>17</sup> Source: BT Press Release, June 22, 1995.

addition there will be two services, games on demand and Adland (an interactive advertising service). All the services will be introduced progressively during the course of the trial.

BT Interactive TV will have more than one hundred service and content providers. In order to provide the movie service, BT is working with European and Hollywood studios including Columbia/Tristar, Handmade Films, Lumiere, MCA, MGM/UA, PolyGram, Rank, Twentieth Century Fox, Walt Disney and Warner Brothers.

BT would be conducting trials on number portability, allowing customers to keep their telephone number when they transfer between telephone companies. BT is committed to number portability and it leads the world in being ready to implement number portability<sup>18</sup>. BT is also taking part in the global trial of Asynchronous Transfer Mode (ATM) which tackles the issues of integrating systems to form wide-area ATM networks<sup>19</sup>.

## **GERMANY**

### **Historical Background**

The formation of the EU has led to changes in Germany. The first step in Germany was taken in 1989 with Postal Reform I. Thus, Deutsche Telekom was one of the successors of the Deutsche Bundespost as an independent company with the legal status of a public company. The second step was taken in 1994; Postal Reform II created the legal foundations to turn Deutsche Telekom into a stock corporation, on 1 January 1995.

In 1993, the Post and Telecommunications Minister of Germany had given clearance for the privatization of Deutsche Telekom. The German Government planned to sell some US\$10 billion in stock in the first half of 1996, another US\$10 billion in 1998 and its remaining company holdings beginning in the year 2000<sup>20</sup>.

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<sup>18</sup> Source: BT Press Release, April 27, 1995.

<sup>19</sup> Source: BT Press Release, September 18, 1995.

<sup>20</sup> Source: ProQuest - The New York Times (R) Ondisc, November 8, 1993.

## **Liberalization/Competitions**

Germany will open its telephone service market to competition on January 1, 1998. An unlimited number of private companies would be allowed to apply for licenses as announced by the Post and Telecommunications Minister, Wolfgang Boetsch<sup>21</sup>. The Economics Minister, Gunter Rexrodt, had pushed to open the German market sooner. But other German officials reportedly thought that the privatization of Deutsche Telekom might be damaged by quick exposure to foreign competition. The first licenses to private companies should be granted early in 1997.

A joint federal-state German regulatory panel had decided to allow the nation's three mobile phone operators to lay their own cables to connect their transmission sites across Germany. The decision freed them from having to rent lines from the state-run Deutsche Telekom. The companies are E-Plus, Mannesmann Mobilfunk and Detemobil<sup>22</sup>.

The German industrial company Thyssen A.G. announced that it had formed a partnership with BellSouth to compete with Deutsche Telekom in the German telephone market. Several large German companies are positioning themselves with such alliances to take away part of Deutsche Telekom's market, set to open to competition gradually. Thyssen said its telecommunications arm would take a 60% stake in the new joint venture, with the rest being taken by BellSouth, which is based in Atlanta. Thyssen planned to invest between US\$2 billion and US\$2.6 billion in building up its telecommunications business till the year 2000<sup>23</sup>.

### **Deutsche Telekom**

Deutsche Telekom's services include telephony, mobile radio services, cable television network, ISDN, on-line service, etc. With an advanced fiber optic network, Deutsche Telekom is positioned to provide multimedia services.

The corporate principles of Deutsche Telekom are as follow<sup>24</sup>:

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<sup>21</sup> Source: ProQuest - The New York Times (R) Ondisc, March 28, 1995.

<sup>22</sup> Source: ProQuest - The New York Times (R) Ondisc, September 20, 1995.

<sup>23</sup> Source: ProQuest - The New York Times (R) Ondisc, January 25, 1995.

<sup>24</sup> Source: Company literature over the Internet.



- Deutsche Telekom is a communications and information company;
- Deutsche Telekom is active in the national and international arena;
- Commitment to ensuring customer satisfaction;
- Taking advantage of every opportunity in the competitive environment;
- Acting according to entrepreneurial principles;
- Making a profit to ensure the future of the company;
- Each and every member of staff contributes towards its success; and
- Deutsche Telekom recognizes its responsibility to society.

## **Deutsche Telekom Strategies**

### Restructuring

Deutsche Telekom took full advantage of the challenges and opportunities presented by the Postal Reform II. The former technical-functional administration had been restructured into a customer-orientated company with a flexible group structure. All internal processes and the whole customer support field have been constantly improved since 1990. Apart from the Deutsche Telekom parent company, the corporate group includes several legally and economically independent subsidiaries, many affiliated companies as well as joint ventures formed with international partners.

Deutsche Telekom's biggest immediate problem is its debt, estimated at more than US\$60 billion, a level that represents almost 70% of its total assets<sup>25</sup>. The debt has mounted in recent years because of its heavy investments in eastern Germany, a nationwide cable television network and national cellular telephone system. Analysts believed that most of the proceeds from the expected upcoming stock sales in 1996 and 1998 would go towards debt repayment.

At end 1995, Deutsche Telekom's Supervisory Board approved the transfer of Deutsche Telekom's on-line activities to T-Online GmbH, a new subsidiary to be established. This move would provide the necessary basis for the company's planned cooperation with Bertelsmann AG, with America Online Inc. and with Axel

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<sup>25</sup> Source: ProQuest - The New York Times (R) Ondisc, October 28, 1994,

Springer Verlag AG<sup>26</sup>. The four companies had signed a Memorandum of Understanding for a long-term strategic partnership in the area of interactive on-line services. Within this cooperation, Deutsche Telekom will acquire an interest in America Online and in Bertelsmann's and America Online's European joint venture.

The Supervisory Board also approved renaming DeTeAtlas GmbH, a subsidiary founded in September 1994, as T-Data GmbH. T-Data would take over all of Deutsche Telekom's Datex-P activities. Deutsche Telekom carried out this transfer in fulfillment of a condition imposed by the European Commission. Originally, the Datex-P packet-switched service was to be incorporated within Atlas, the Franco-German joint venture. Pursuant to the agreement with the European Commission for approval of Atlas, this would not be possible until January 1, 1998.

#### Globalization/Strategic Alliance

Deutsche Telekom has started preparing itself for the future competition. Together with Ameritech Corporation, it would pay US\$875 million for 30% of Matav, Hungary's state telephone company and a 25-year contract to upgrade and operate Hungary's telephone system<sup>27</sup>. Deutsche Telekom and Ameritech, which is based in Chicago, would invest US\$437.5 million each. The Hungarian Government would retain a 70% stake in the telephone company.

The most news-worthy alliance was that among Deutsche Telekom, France Telecom and Sprint, US's third-largest long-distance telephone carrier, to form a global telecommunications partnership, called Phoenix (renamed to Global One since). The approvals from US Justice Department and the European Commission had removed the biggest remaining uncertainty for the US\$3.5 billion deal, and set the stage for a broad new rivalry with similar alliances formed by AT&T and BT. Under the consent decree from the US Justice Department, Phoenix would be prohibited from buying services on a preferential basis from either Deutsche

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<sup>26</sup> Source: Deutsche Telekom Press Release, December 12, 1995.

<sup>27</sup> Source: ProQuest - The New York Times (R) Ondisc, December 20, 1993.

Telekom or France Telecom until open competition had begun in their markets<sup>28</sup>. Deutsche Telekom and France Telecom, had invested for a 20 % stake in Sprint.

Deutsche Telekom had reached an agreement with six other leading international telecommunications, network and software companies to jointly develop a world-wide, secure and publicly administered data superhighway for multimedia applications<sup>29</sup>. Furthermore, a Multimedia Services Affiliate Forum was formed where standards were to be drawn up for the relevant services and the seamless flow of traffic between the individual networks as well as network interoperability. The founding members of the Multimedia Services Affiliate Forum are AT&T, Deutsche Telekom, Lotus, Novell, NTT, Telstra and Unisource.

#### Infrastructure Modernization/Development

Deutsche Telekom had begun operating the first City Networks in Frankfurt, Berlin and Hamburg. City Networks employ state-of-the-art optical fiber telecommunications technology and permit use of a wide range of services. With its CityLAN product, Deutsche Telekom offered a complete solution for linking local area networks (LANs) located throughout municipal areas. Such LANs could be linked, via Datex-M (the first ATM service) to sites outside the City Network<sup>30</sup>.

In September 1995, Deutsche Telekom inaugurated a new state-of-the-art control center, located in Düsseldorf, for its telecommunications networks. In its ultimate configuration, the PROTOS management system would control and monitor 84 transmission network nodes for remote-control switching, fault analysis and immediate restorations. PROTOS is part of Deutsche Telekom's Synchronous Networks project which began in 1992. Transmission equipment is being installed that, in conjunction with PROTOS, will permit cost reductions and new, flexible features in network planning, installation and operation<sup>31</sup>.

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<sup>28</sup> Source: ProQuest - The New York Times (R) Ondisc, July 14, 1995.

<sup>29</sup> Source: Deutsche Telekom Press Release, October 2, 1995.

<sup>30</sup> Source: Deutsche Telekom, Press Release, November 30, 1995.

<sup>31</sup> Source: Deutsche Telekom Press Release, October 2, 1995.

### Cost Reduction/Rationalization/Productivity Improvement

Deutsche Telekom and the union had agreed that by the year 2000, the number of employees would be reduced to 170,000. At the end of 1995 there were approximately 215,000 employees, around 15,000 fewer than at the beginning of the year. The new collective agreement also abolished the current limitations on the mobility of employees. This meant surplus personnel would be redeployed all around Germany to fill vacant posts. To ensure the motivation of the employees concerned and the quality of Deutsche Telekom's services, employees' transfers went along with financial contributions such as accommodation cost allowances and travel subsidies and a comprehensive training program<sup>32</sup>.

Deutsche Telekom had created an innovative employee share scheme. Besides the conventional employee shares program, a preferential allotment of Deutsche Telekom shares and an employees' investment company were instituted. The three possibilities might be freely combined with one another. The Deutsche Telekom shares would have a nominal value of DM 5 in order to attract the widest public possible. The new program was a contribution to employee motivation and employees were encouraged to take the opportunity to become partners in Deutsche Telekom<sup>33</sup>.

### Continual Service Enhancement/New Service Provision

With its 1996 Tariff Concept, Deutsche Telekom is introducing for the first time special bulk discounts and tariff options both for international and domestic calls. Customers with a monthly traffic volume worth greater than DM 5,000 net could choose between various options, tailor-made to their specific user profile. The possible savings are up to 35%. Additionally Deutsche Telekom is not passing on to the customer the additional cost of value added tax which will be payable on telephone services from 1 January 1996, which represents a price reduction of 13 percent for the majority of business customers<sup>34</sup>.

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<sup>32</sup> Source; Deutsche Telekom, Press Release, November 6, 1995.

<sup>33</sup> Source; Deutsche Telekom Press Release, December 13, 1995.

<sup>34</sup> Source; Deutsche Telekom Press Release, October 16, 1995.

Since March 1995, Deutsche Telekom had been offering its new T-Card service. The customers could use the T-Card to make cashless calls from anywhere in Germany and in over 50 countries. The T-Card is offered in three versions: as a prepaid phone card, as a charge card and as a charge card with an optional chip. EUROCARD holders can settle their T-Card bill directly through their EUROCARD. The T-Card with chip can be used like a normal telephone card with all card-operated telephones, in the German Railways' InterCity trains, and with public fax machines. It is available for a price of DM 10. For the prepaid cards, the T-Card 25 (costing DM 25) is available with the T-Card 50 (DM 50) soon to be introduced<sup>35</sup>.

Deutsche Telekom introduced a cost-effective and practical solution for doctors called DOXX which made exchange of data and information more efficient and convenient. DOXX is compatible with computer systems widely used by doctors. With DOXX, doctors can exchange quickly, with each other and with clinics, many different types of patient data, including doctors' letters, diagnoses, X-ray and ultrasound pictures, messages and sound and video files. In addition to facilitating exchanges of patient data, DOXX supports diagnoses and therapeutic decisions by providing capabilities for exchange of electronic messages between doctors and for research in numerous medical on-line databases<sup>36</sup>.

### Research and Development

The emphasis of Deutsche Telekom's research and development is on innovative network design, network component and communication services as well as process efficiency. The work includes development of broadband ISDN, ATM technology and the Advanced Intelligent Network (AIN)<sup>37</sup>. For example, at Telecom '95 in Geneva, Deutsche Telekom used a broad range of multimedia teleservices to demonstrate the capability of ATM applications.

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<sup>35</sup> Source: Deutsche Telekom Press Release, October 2, 1995.

<sup>36</sup> Source: Deutsche Telekom Press Release, October 2, 1995.

<sup>37</sup> Source: Deutsche Telekom Annual Report 1993.

Multimedia telecommunications services make aircraft maintenance more reliable and efficient. BISAM provides new means of identifying, analyzing and eliminating problems in aircraft components. The system makes it possible to exchange information quickly, and to process large amounts of data through the use of flexible teleservices. This shortens repair cycles and reduces costly travel. With these systems, the maintenance technician can easily access any database application required for problem analysis. The high-resolution picture transmission facilitates decisions regarding damage and its causes. BISAM also makes possible video conferences in which safety-relevant decisions can be made through direct consultation among all involved specialists.

In a pilot phase that began in September 1995, Lufthansa AG is testing BISAM at its home base in Frankfurt. Subsequently, test operations will be expanded, and a national information network will be created comprising the major German airports, two international sites and central maintenance in Frankfurt. The project is to continue until mid-1996, by which time a decision is expected concerning regular operations with the BISAM system at Lufthansa<sup>38</sup>.

## **FRANCE**

### **Historical Background**

France Telecom was formerly the DGT before its renaming in January 1988. In January 1991, France Telecom became an autonomous public company, fully state owned and outside the government apparatus. The environment in which France Telecom would operate would be changed with the EU's decision to fully liberalize the telecommunications services by January 1, 1998.

The French government has implemented the Service Directive through the adoption of Law No. 90-1170 on the regulation of telecommunications in December 1990. According to the law, France Telecom is authorized to supply bearer services while other providers need licenses. The Ministry of Industry, Post and Telecommunications and Foreign Trade ensures that the regulations are respected

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<sup>38</sup> Source: Deutsche Telekom Press Release, October 2, 1995.

by the public operators and furthermore that the regulation and operation are independent<sup>39</sup>.

France government had revealed that it planned to shelve the reform of France Telecom's statutes and delay privatization<sup>40</sup>. The decision to slow down reform showed the government's unwillingness to risk social unrest and unemployment. It believed that France Telecom could prepare for liberalization without being privatized. Opposition to liberalization of the telecommunications industry in France is strong. Public employees staged a one-day strike in May 1995 to protest the EU's plans to end state monopolies in telecommunications, postal service, energy and transportation<sup>41</sup>. Analysts said the work stoppage marked the beginning of what could be a fierce conflict because French public services are less prepared for deregulation than are many of their counterparts in other European nations. The workers fear that the EU's plans would lead to privatization and to layoffs.

### **Liberalization/Competition**

Although France Telecom has SFR as a competitor for its public mobile phone service presently, new competitors to the market in the run-up to 1998 are expected. For example, in 1995, Generale des Eaux of France announced forming a venture with Unisource<sup>42</sup>. The pact between Generale and Unisource is aimed at providing business telecommunications services in France. Generale will control 50.01% of the venture, which is called Iris.

However, a greater potential threat to France Telecom could be the full entry of Alcatel into the service business. Alcatel has close partnership with France Telecom in the supply of telecommunications systems, and research and development. Alcatel has deferred trying to become a service operator. However,

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<sup>39</sup> Source: Communication by the Commission to the European Parliament and the Council on the Status and Implementation of Directive 90/388/EEC, Brussels, April 4, 1995, COM(95) 113 final.

<sup>40</sup> Source: Financial Times, July 13, 1995.

<sup>41</sup> Source: ProQuest - The New York Times (R) Ondisc, May 31, 1995.

<sup>42</sup> Source: ProQuest - The New York Times (R) Ondisc, April 13, 1995.

Alcatel has already invested in Globalstar, a global mobile satellite service, and in Alcatel Data Network with Sprint.

The strategies adopted by France Telecom to position for competition in the future are quite similar with the rest. Apart from local and long-distance switched voice, France Telecom provides businesses and consumers with pay telephones, leased lines, customized data networks, wireless and cable television services. France Telecom has been active in international telecommunications for decades and has acquired substantial global experience as provider of basic telephony and value added services.

### **France Telecom Strategies**

#### Restructuring

France Telecom reported for the first time its financial results on a consolidated basis for 1994. In addition to the parent company, France Telecom, the scope of consolidation includes 87 companies, the largest of which are: Transpac, TDF, FCR, France Telecom Logiciels et Services (FTLIS), EGT, France Telecom Mobile Services (FTMS), France Telecom Mobiles Radiomessagerie (FTMR), VTCOM, France Telecom Cable, Eunetcom, France Telecom Mobiles International (FTMI), and CAT<sup>43</sup>.

#### Globalization

In 1994, an end-to-end digital leased line serving France, UK and US was introduced which allowed companies to build high quality international networks by working through a single point of contact. It also opened the digital trans-Atlantic video service sold through one-stop shopping in October 1994. This two-way service was operated jointly by France Telecom, its British subsidiary, Maxat and its American partner, Keystone Communications<sup>44</sup>.

France Telecom offered its international virtual private network to London, Amsterdam, Stockholm, Holland and Germany. It had also signed a long term

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<sup>43</sup> Source: France Telecom Press Release, May 31, 1995.

<sup>44</sup> Source: France Telecom Annual Report, 1994.



agreement to take part in a US\$500 million project to develop Vietnam's telephone network<sup>45</sup>.

### Strategic Alliance

As mentioned, France Telecom was involved in an alliance with Deutsche Telekom to form Atlas in 1993. Another joint venture with Deutsche Telekom was Eunetcom which provides the global communication needs of large multinational corporations. Deutsche Telekom, France Telecom and Sprint had announced the closing of their new global telecommunications joint venture, Global One. It is previously known as Phoenix and is a combination of several businesses - including Atlas, the newly created joint venture between France Telecom and Deutsche Telekom - from the three parent companies. In addition, France Telecom and Deutsche Telekom acquired shares in Sprint preference stock. Following full investment, France Telecom and Deutsche Telekom will each own shares of approximately 10% of Sprint's voting power. The total amount of the investment is expected to be between US\$3.5 billion to US\$3.7 billion<sup>46</sup>.

France Telecom and Telesystem International Wireless (TIW) of Canada had announced the formation of the MoNet consortium<sup>47</sup>. The consortium would bid for the second GSM license being offered by the Czech government. MoNet would bid for a 49% stake in a joint-venture to be created with Ceske Radiokomunikace (Czech Radiocommunications), the Czech state-owned broadcaster. The consortium was led by France Telecom through its subsidiary France Telecom Mobiles International (FTMI).

France Telecom and Bell Atlantic incorporated a new joint venture company named TELFAR, which submitted a bid for a 27% share of the Czech telecommunications operator SPT Telecom in February 1995<sup>48</sup>. TELFAR's proposal focused on assisting SPT Telecom to deliver high quality, universal communication

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<sup>45</sup> Source: ProQuest - The New York Times (R) Ondisc, March 25, 1994.

<sup>46</sup> Source: France Telecom Press Release, Jan. 31, 1996.

<sup>47</sup> Source: France Telecom's Press Release, January 29, 1996.

<sup>48</sup> Source: France Telecom's Press Release, February 27, 1995.

and information services to all customers in the Czech Republic, at affordable prices.

Olivetti and France Telecom reached a preliminary agreement for the creation of a new joint venture, with the objective of becoming the leading alternative telecommunications operator in Italy<sup>49</sup>. The new company would operate and manage a telecommunications network in Italy, and provide the liberalized areas of the Italian market with telecommunications products and services. Its main objective was to have a leading role in the telecommunications market in Italy, which is expected to be fully liberalized by January 1998. The joint venture was owned 51% by Olivetti with Bell Atlantic and others, and 49% by France Telecom.

In 1994, France Telecom announced that it would join a number of high-powered companies in investing in General Magic Inc. of California<sup>50</sup>. General Magic, which is trying to set the standard for wireless personal communication, develops software that uses "intelligent agents". Other companies that hold a stake in General Magic include AT&T, Apple Computer, Motorola, Matsushita Electric Industrial, Philips, Sony, Fujitsu and Toshiba.

#### Infrastructure Modernization/Development

The end of 1994 saw the replacement of its last electromechanical switch. France Telecom network saw a steady increase in fiber optic deployment as well as advanced technology like IN and ATM. France Telecom ensures the quality of its international calls through the widespread use of satellites and by investing in new submarine cables. It has a stake in the SEA-ME-WE2 submarine cable linking France to Singapore<sup>51</sup>.

France Telecom is implementing its first information superhighway network within the scope of the French government's strategically important information superhighway trial program. It has deployed fiber optic circuits to serve over 350

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<sup>49</sup> Source: France Telecom's Press Release, November 15, 1995.

<sup>50</sup> Source: ProQuest - The New York Times (R) Ondisc, April 13, 1994.

<sup>51</sup> Source: France Telecom Annual Report, 1994.

office blocks since 1992, as well as the one million kilometers of fiber optic lines already installed in the French public telephone network. These networks will serve several tens of thousands of homes and offices. These fiber optic distribution networks will be laid right up to buildings ( Fiber To The Building) or to distribution points for small groups of homes (Fiber To The Curb)<sup>52</sup>. Subscribers will benefit from immediate access to the full range of telecommunications services, including analog telephony and ISDN; leased lines; analog and digital radio and television broadcasting, with the option of pay-per-view; data transfer and downloading; and high-speed access to on-line services and the Internet. Network subscribers will also have access to emerging interactive broadband services, including video on demand (VOD) and news on demand (NOD), as well as a host of multimedia services.

France Telecom has been a pioneer in ATM, opening an initial commercial high-speed LAN interconnection service, Transrel ATM , in October 1994. Transrel ATM is the first phase in the ATM Multiservice Offer. The ATM Multiservice Offer can be used as the backbone for an entire enterprise network, transporting voice, data and video on a periodic or occasional transfers of high-volume traffic. It is designed for such applications as PABX interconnection, LAN interconnection, channel extension, computer system backup or any other service requiring flexible bandwidth<sup>53</sup>. In France, the infrastructure for the ATM Multiservice Offer is already available in and around Paris, Bordeaux, Grenoble, Lyon, Marseille, etc.

#### Cost Reduction/Rationalization/Productivity Improvement

It is France Telecom's policy to reduce the debt of the Group. On December 31, 1994, the Group's net debt totaled FF96.6 billion, equivalent to 70.9% of total equity. Interest expense amounted to 5.3% of consolidated revenues in 1994. It had accelerated its debt reduction in 1994. On December 31, 1994, the company's debt

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<sup>52</sup> Source: France Telecom Press Release, In July 25, 1995.

<sup>53</sup> Source: France Telecom Press Release, October 4, 1995.

stood at FF95 billion, compared with FF105.6 billion at year end 1993. This represented a debt reduction of FF10.6 billion in 1994<sup>54</sup>.

France Telecom is committed to a total quality approach where new ways of providing better services through customer feedbacks are continually introduced. Customer Service Departments work hard to answer customer letters and it carries out annual customer surveys covering every aspect of its business.

#### Continual Service Enhancement/New Service Provision

In January 1994, France Telecom initiated a tariff reform which reduced the effect of distance on the telephone call rates and created larger local calling areas. These new areas meant that its customers could make more calls at the lowest rate and fairer than before. It reduced the rate of automatic international calls effective in March 1995. The reductions applied to nearly 200 destinations called from mainland France and to all international destinations called from French overseas departments<sup>55</sup>.

In June 1995, France Telecom reduced the cost of long-distance calls by 10%. The cost of long-distance calls has dropped 46% since 1985. The continual lowering of long-distance rates is in line with France Telecom's policy of tariff rebalancing<sup>56</sup>. Furthermore, France Telecom's 1995 -1998 contractual agreement with the State requires the carrier to implement an overall rate reduction of 4.5% in relation to the consumer price index in 1995.

In conforming to its 1995 -1998 contractual agreement with the State, France Telecom announced a rate rebalancing in January 1996 to lower call prices by an average of 5.5% in 1996 versus the consumer price index. France Telecom will lower the price for direct dial international calls by an average of 8.9%. These lower rates will now apply for outbound calls from metropolitan France to 200 destinations worldwide<sup>57</sup>.

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<sup>54</sup> Source: France Telecom Press Release, May 31, 1995.

<sup>55</sup> Source: France Telecom Press Release, March 2, 1995.

<sup>56</sup> Source: France Telecom Press release, June 16, 1995.

<sup>57</sup> Source: France Telecom Press Release, January 18, 1996.

France Telecom is introducing three solutions for connection to Internet access providers, all offering uniform tariff structures throughout France. In addition, the French carrier's subsidiary, France Telecom Multimedia, has announced that it will compete as a full-fledged Internet provider with other players in this market. France Telecom Multimedia will roll out its Internet offering during the first half of 1996, providing access and marketing Internet navigation and communications tools (email, news service, gateway to Minitel services, etc.). Furthermore, France Telecom Multimedia will offer an array of on-line services, including an electronic mall and Web-format white and yellow page directories<sup>58</sup>.

Its videotex Minitel service was enhanced with the launch of the TVR high speed services which transmit information eight times faster than before so that photographic quality pictures could be received. At the same time two new models of the Minitel terminal were introduced. The first had simplified controls, was smaller and more compact and offered a range of new services like icon based user guidance and built-in smart card reader permitting electronic bill payment. The second was a display phone which combined phone, Minitel terminal and digital answering machine into one device.

#### Research and Development

As the biggest European telecommunications research center, CNET, France Telecom's national research center, is strong in ATM, optical transmission and IN research as well as digital television in tandem with CCETT, France Telecom's other research center. Collaboration with CCETT led to the formulation of the Digital Video Broadcasting (DVB) standard in 1994<sup>59</sup>.

France Telecom is committed to take a leading role in developing new trial services on information superhighways. Trial projects will involve partnerships with service providers, as well as provision of platforms designed to make new services available to subscribers. France Telecom's investments in information

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<sup>58</sup> Source: France Telecom Press Release, January 12, 1996.

<sup>59</sup> Source: France Telecom Annual Report, 1994.

superhighway development will total FF1 billion over the next three to four years<sup>60</sup>. Starting in the second half of 1995, projects would be launched in four key sectors: on-line services for the general public, on-line business services, telecommuting (distance learning, etc.) and interactive television (teleshopping, games, etc.) The trial services would run initially on existing infrastructures and later on high-speed networks such as ATM and fiber optic cable.

France Telecom has selected the manufacturers who will supply terminals, network equipment and software for the launch of the initial digital television services meeting the standards approved by Europe's DVB project. France Telecom is pursuing this program as a trial of the new information highway services. Initial full-scale tests could take place as early as the first quarter of 1996, offering radio, television, data and multimedia services according to various schemes, i.e., subscription, pay-per-view, pay-per-time, etc. Among these new functions are an advanced electronic program guide, near video on-demand (NVOD), high-speed software downloading to peripherals and teleshopping<sup>61</sup>.

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<sup>60</sup> Source. France Telecom Press Release, March 20, 1995.

<sup>61</sup> Source: France Telecom Press Release, June 6, 1995.

## 4. THE JAPANESE TELECOMMUNICATIONS EXPERIENCE

### **HISTORICAL BACKGROUND<sup>1</sup>**

Since 1890, the telecommunication services had been operated as a governmental entity. In 1949, the telecommunications business was spun off from the Communication Ministry to become the Telecommunication Ministry. Soon after this, there were arguments that the telecommunications business should not be run by a governmental agency. Consequently, Nippon Telegraph and Telephone Public Corporation (NTT) was created to carry out domestic telecommunications as a monopoly in 1952. This was followed in 1953 by the creation of Kokusai Denshin Denwa Co., Ltd. (KDD), a private entity separate from NTT, which also had a monopoly to provide international telecommunication services.

### **LIBERALIZATION**

In 1981, the Provisional Commission on Administrative Reform was established to find ways of reducing the government finance deficit. On April 1, 1985, Japan's new Telecommunications Business Law came into force and introduced competition into Japan's domestic and international telecommunications businesses. It replaced the former Public Telecommunications Law which provided for only two telecommunications carriers: NTT as the sole domestic operator and KDD as the international carrier.

The new law classifies telecommunications business into two main types: Type I for facility based business and Type II for VAN and resale business<sup>2</sup>. The classification is not service based, so carriers in both categories could provide any kind of telecommunications services. Type I carriers provide telecommunications services by establishing their own telecommunication facilities and their licenses are granted by the Ministry of Post and Telecommunications (MPT). Type I carriers are required to specify service rates and other conditions in their tariffs for approval by MPT. The proportion of foreign ownership in Type I carrier is limited to less than

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<sup>1</sup> Source: The Turning Point: A Study of the Proposed Breakup on NTT, MIT M.S. of Management thesis (1995) by Norio Sakai.

<sup>2</sup> Source: Nobuyoshi Mutoh, Paper in "Restructuring and Managing the Telecommunications Sector", A World Bank Symposium, November 17-19, 1987.

a third. A Type II carrier provides telecommunications services by using telecommunications facilities leased from Type I carriers. Foreign investment is not restricted in a Type II business.

Type II carriers are further divided into special and general. A special Type II carrier provides large scale telecommunications services for a large number of unspecified persons or provides telecommunication services between Japan and foreign countries. Special Type II carriers must register themselves with the MPT and must notify MPT of their service rates and other conditions. General Type II carriers are any Type II carriers other than special Type II carriers (this category includes the value added service providers). As they provide services to specified users and their influence is limited, general Type II carriers need not have to notify MPT of their service rates or service conditions.

### **New Entrants**

Soon after the new law came into effect, five companies obtained permission from MPT to operate as Type I carriers in the domestic market. In March 1986, a sixth carrier was authorized. (See Exhibit 4-1).



CARRIERS	MAJOR SHAREHOLDERS	SERVICES	SERVICE AREA	FACILITIES
Daini Denden Inc. (DDI)	Kyocera Corp.	Leased Circuits	Tokyo Metropolis, Aichi Prefecture, Osaka Prefecture and their vicinity	Microwave radio
Japan Telecom Co. (JT)	Japan Railways	Leased Circuits	Areas along Tokaido, Sanyo, Tohoku and Joetsu Shinkansen Railway	Optical fiber cable
Teleway Japan Corp. (TWJ)	Toyota Motors, Highway Services Facilities Association	Leased Circuits, Long-Distance Telephony	Areas along Tokyo - Magoya-Kobe Highway	Optical fiber cable
Japan Communications Satellite	C Itoh, Mitsui, Hughes Communications	Leased Circuits	Nationwide	Satellites
Space Communications Corp.	Mitsubishi	Leased Circuits	Nationwide	Satellites
Tokyo Telecom. Network (TTNET)	Tokyo Electric Power, Mitsui, Mitsubishi	Leased Circuits, Long-Distance Telephony	Tokyo Metropolitan Area	Optical fiber cable

Exhibit 4-1: New Type I Entrants in Domestic Market by 1987<sup>3</sup>.

DDI, JT and TWJ started to operate domestic long-distance telephone services in competition with NTT in 1987 in addition to leased circuit services that were offered a year before. As for Type II carriers, by 1988, some 17 companies had registered to operate special Type II businesses and some 475 companies had notified MPT of their intention to operate general Type II business. As at June 1993, there were some 88 Type I carriers and 1207 Type II carriers<sup>4</sup>.

In the international telecommunications business, two companies had applied for licenses to become international Type I carriers. International Telecom Japan (ITJ) and International Digital Communications (IDC) planned to provide

<sup>3</sup> Source: Nobuyoshi Mutoh, Paper in "Restructuring and Managing the Telecommunications Sector", A World Bank Symposium, November 17-19, 1987.

<sup>4</sup> Source: The Asia Pacific Telecommunity Yearbook, 1994.

international leased circuit service and international telephone service via submarine cables and Intelsat satellites.

Soon after entering the market, DDI, JT and TWJ collectively increased their market share and sales revenue, in part due to heavy protection policies of the government. The government allowed them to price their rates at up to 10% discount of NTT's rates. They were also successful because they took advantage of the latest technology and did not have to provide universal service, unlike the requirement imposed on NTT. Thus the New Common Carriers (NCCs) were able to practice skim-creaming. However as competition matures, the governmental support for NCCs gradually disappears (the government rate differentiation policy ended in 1993) and NCCs have to expand to less profitable regions to develop their clientele base with adverse impact on revenue.

In the local call service market, about ten competitors exist in competition with NTT. TTNET is a typical player in the Tokyo and Kanto areas. Though competition is not as great compared with that in the long-distance arena, these companies would pose a major threat to NTT in the future.

### **Likely Split-up of NTT**

When NTT was being privatized on April 1, 1985, there were debates on the pros and cons of the break-up of NTT. The NTT Act required that the government would discuss again the issue in five years in 1990. This was later postponed to 1995.

The government is unlikely to reach a final decision on whether to break up NTT in 1996. The Ministry Telecommunications Council is currently debating the issue. Some advocate a break-up to stimulate competition in Japan's telecommunications industry, but others say Japan needs a strong national telecommunications champion. NTT itself is strongly opposed to a break-up.

### **NTT STRATEGIES**

NTT is the largest nationwide provider of telecommunications services in Japan offering telephone, cellular telephone, telegraph, leased circuits, data

communication facilities, digital data exchange, paging and other services. Its mission according to its 1994 Annual Report is:

- to provide high quality, reliable telecommunication services while working to enhance network sophistication;
- to conduct research and development activities that will support the telecommunication network of the 21st century and will contribute to a broader range of service offerings, while making the results of this research and development available to promote the development of the industry in general; and
- to place increasing emphasis on overseas activities.

In the subsequent paragraphs, I will detail the strategies adopted by NTT in the face of competition although by necessity, the list in each strategic thrust is by no means exhaustive.

### **Reorganization**

After its privatization, NTT had changed its organization structure several times. NTT began switching its previous administrative organization which was based on functions such as sales, planning, etc. to a departmental system based on type of service. Each department was given greater authority and responsibility<sup>5</sup>.

To develop highly competitive products, each product development section previously affiliated with the laboratories was placed under the appropriate business department. At the same time, NTT increased the number of its research institutes. NTT reorganized its operations into four main divisions in fiscal 1994<sup>6</sup> to allow NTT to provide quick and accurate responses to customers' needs. These divisions were:

- the Service Marketing and Support Headquarters;
- the Business Communications Headquarters;
- the Service Engineering Headquarters; and

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<sup>5</sup> Source: Toru Uehara, Paper in "Restructuring and Managing the Telecommunications Sector", A World Bank Symposium, November 17-19, 1987.

<sup>6</sup> Source: NTT Annual Report, 1994.

- Research and Development Headquarters.

The mobile telecommunications business has been growing very fast but NTT was restricted by regulations. In 1992, NTT decided to establish NTT DoCoMo to participate in this market segment. NTT DoCoMo had been broken up into nine regional companies in 1993 under the policy of encouraging regional competition.

### **Globalization**

In November 1992, NTT participated in its first large scale overseas telecommunication venture by signing a contract to assist Thai Telephone and Telecommunications (TT&T) with the design, construction and operation of a one million circuit enlargement of a regional phone system<sup>7</sup>. NTT acquired 20% of TT&T in order to participate in this project. In November 1993, NTT signed an agreement with Nextel to establish a strategic alliance<sup>8</sup>. Nextel is one of the largest mobile service providers in US. NTT purchased 0.9% share of Nextel with US\$75 million. In this alliance, NTT agreed to provide technical expertise on the design and management of Nextel's network. Henceforth plans were formulated to actively internationalize its operation to meet new requirements for globalization including the establishment of liaison offices and the formation of overseas subsidiaries. NTT International, founded in 1985 to promote international business by offering NTT's technological and managerial resources to potential customers has been consulting on telecommunications infrastructure projects in countries such as Indonesia, the Philippines and Guatemala.

### **Strategic Alliance**

In January 1994, NTT made its first strategic alliance with a foreign multimedia software developer known as General Magic<sup>9</sup>. General Magic is a spin-off company from Apple Computer. NTT is aggressively seeking strategic alliance with foreign organizations in software development for multimedia services because of a lack in domestic expertise. General Magic had developed Telescript and Magic

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<sup>7</sup> Source: Source; NTT Annual Report, 1994.

<sup>8</sup> Source: Telecommunications Reports January 24, 1994.

<sup>9</sup> Source: Telecommunications Report, January 31, 1994.

Cap for message communications. Many key players such as AT&T , Apple and Motorola had invested in General Magic.

In March 1994, NTT and Microsoft announced an alliance to jointly develop services that would allow users to access multimedia information on the telecommunications network<sup>10</sup>. One of the principal aims of the alliance is to develop a method of exchanging multimedia information using CD-ROM. Another is to ensure compatibility between Microsoft's operating system software and F-Net, NTT's enhanced facsimile network thereby allowing seamless services.

In June 1994, NTT and Silicon Graphics announced the signing of a Memorandum of Understanding to develop an interactive multimedia services system in Japan<sup>11</sup>. Video on demand will become a reality through this system. The system will use an advanced digital media distribution network and three dimensional visualization on a network incorporating ATM and fiber optic technologies.

NTT had also announced the details of its utilization test of multimedia communications and begun to seek partners to cooperate in these testing activities. One objective of the tests was to develop new applications needed in the coming multimedia age through the coordination of networks, user facilities and software.

### **Infrastructure Modernization/Development**

NTT's mission is to provide more sophisticated services to its customers and thus an advanced network infrastructure is required. Presently, NTT is concentrating its resources on the digitalization of subscriber terminals by fiscal year 1998. Plans also call for installing fiber optic access networks for major business areas by 1997 and smaller business areas by 2000 followed by suburban and other non-metropolitan areas. Over this period, the ATM technology would be incorporated.

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<sup>10</sup> Source: NTT Annual Report, 1994.

<sup>11</sup> Source: NTT Annual Report, 1994.

## **Cost Reduction/Rationalization/Productivity Development**

To cope with the competition, NTT rapidly reduced the number of its employees. Previously, the reduction in employees was achieved without retrenchment but through natural attrition and not filling up all the vacant posts as well as redeployment of the employees. The number of employees assigned to administrative departments was greatly reduced. Since privatization, NTT had reduced about 100,000 employees and planned to reduce another 30,000 by 1997 by introducing compulsory retirement for the first time in Japanese industry<sup>12</sup>.

To enhance its competitiveness, in fiscal year 1994, NTT had adopted policies to rationalize its operations and reduce costs. Main policies adopted included:

- offering the option of voluntary early retirement for an estimated 10,000 employees in fiscal years 1994 and 1995;
- closing and consolidating certain offices in restructuring exercises while continuing to provide a wide range of responsive services;
- reallocating personnel to improve efficiency, including shifting staff to major urban centers where demand is strongest;
- making investments in new operational support systems that increase system reliability and enable cost reductions; and
- large investment was made on staff training.

## **Continual Service Enhancement/New Services Provision**

As mentioned, the NCCs have offered their long-distance services at rates lower than those of NTT, thereby reducing NTT's market share. On a nationwide basis, NTT's share of the long-distance calls was 73% for fiscal 1994<sup>13</sup>. To prevent further erosion of its market share, NTT had reduced its rates and as the result, the rate differential had been greatly reduced. NTT believed the competition in long-distance market had moved from price to service quality and variety of services. Accordingly, NTT introduced several optional calling plans such as discount plan for

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<sup>12</sup> Source: The Turning Point: A Study of the Proposed Breakup on NTT, MIT M.S. of Management thesis (1995) by Norio Sakai,

<sup>13</sup> Source: NTT Annual Report, 1994.

night time, weekends and holidays, Telewise, a monthly toll call charge discount service and Member-Net, an intra-company virtual private network service.

NTT is determined to end the cross subsidy of the local services by the long-distance services by further reduction of the long-distance call rates with corresponding increase in local rates. NTT submitted an application for revising its monthly charges for basic exchange lines and directory assistance service charges to the MPT for approval in March 1994.

NTT has established the Personal Handy-phone System (PHS) technology which allows cordless telephone to communicate at very low rates. The PHS may be able to replace much of the existing telephone sets in the home as well as cellular phones and it will likely be developed into a personal data terminal that supports access to multimedia network. NTT started field trials in Sapporo and Hokkai from October 1993 to March 1994 and in Tokyo in 1994 to prepare for commercial service and had received favorable results. In December 1994, NTT had established nine subsidiary companies called NTT Personal Communication Networks (NTT PCN) which will run the PHS service.

### **Research and Development**

To create an image of the future multimedia world, NTT established the Visual, Intelligent and Personal (VI&P) vision in 1992. The VI&P concept involves the following:

- High speed, broadband visual communication services utilizing ATM switching and light wave technologies offering customers clear colored motion pictures in office and home;
- Intelligent communications using knowledge processing by computers offering consumers convenient and user friendly data transaction services in office and home; and
- Personal communication services using ultra-small portable terminals and network ID search technology offering every consumer compact and less expensive personal terminals conveying data and visual information which are available everywhere.





Research and development would be a cornerstone of its 21st century vision of VI&P telecommunications concept. The research and development is structured around<sup>14</sup>:

- R&D on multifaceted and sophisticated services;
- R&D on networks and service software for the supply of these services;
- leading edge technologies and fundamental research for future telecommunications; and
- domestic and international technology exchange activities to promote the diffusion of R&D results including efforts towards standardization.

### **KDD STRATEGIES**

KDD was established as a special private telecommunication entity under the KDD law in 1953. This law was amended several times to meet Japan's changing international telecommunications requirements. The latest amendment, just before the adoption of the Telecommunications Business Law in 1985, categorized KDD as a Type I carrier as well as a special private company.

The two new rivals, ITJ and IDC, which are held by large trading houses, are both users and providers of international services. KDD thus faced with tough competition. Furthermore, the two rivals have the advantage of being able to focus on providing services in profitable areas whereas KDD has the obligation of providing universal services in accordance with the KDD Law. The effect of competition will be first in the price of services and thereafter in aspects such as service quality, maintenance capability and reliability.

KDD could not rely solely on new technologies to reduce prices. The reduction of cost was critical and KDD underwent a major cost cutting exercise while making big investments in areas that were strategically important. In the area of new services, KDD continued to developed innovative and more sophisticated services that could be applied in such a way as to provide its customers with offerings which best meet their needs.

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<sup>14</sup> Source: NTT Annual Report, 1993.

In the subsequent paragraphs, I will detail the strategies adopted by KDD in the face of competition although by necessity, the list in each strategic thrust is by no means exhaustive.

### **Reorganization**

KDD went through a major restructuring of the organization in 1986 to reinforce its marketing power. A system of accounts managers was implemented to respond more efficiently to customers' needs.

### **Globalization/Strategic Alliance**

As already mentioned, KDD joined hands with AT&T and Singapore Telecom in May 1993 to establish the World Partners, an alliance that provides customized, seamless international services under the World Source brand name.

### **Infrastructure Modernization/Development**

Submarine cables and satellites form the foundation of international telecommunications. KDD had participated in major projects e.g., Trans-Pacific Cable No. 3 (TPC-3) and TPC-4, the first trans-Pacific optical fiber cable and the ASEAN Optical Fiber Submarine Cable Network. KDD is currently participating in the construction of TPC-5CN, an optical fiber submarine cable network that will link Japan and US in a loop as well as in the Asia Pacific Cable Network (APCN). KDD's recent participation in submarine cable construction is presented in Exhibit 4-2.

On satellite transmission, KDD is the only company in Japan providing Inmarsat services. It is expanding the use of other satellite organization to provide more flexible services e.g., accessing PANAMSAT satellite in 1995.

CABLE NAME	LAND BASES	NO. OF CIRCUITS	SCHEDULED OPENING
TPC-5CN	Miyazaki, Ninomiya, Coos Bay (US), San Luis Obispo (US), Hawaii, Guam	120,960	1995-1996
APCN	Japan, South Korea, Taiwan, Hong Kong, Philippines, Singapore, Malaysia, Thailand, Indonesia, Australia	60,480	1996
RIOJA	Spain, UK, Belgium, Netherlands	60,480	1995
ODIN	Netherlands, Denmark, Norway, Sweden	30,240	1995
TVH	Thailand, Vietnam, Hong Kong	7,560	1995
TAT-12/13	USA, UK, France	120,960	1995-1996

Exhibit 4-2: Submarine Cable Projects<sup>15</sup>.

### **Continual Service Enhancement/New Service Provision**

KDD recognizes the crucial importance of efficient and reliable international telecommunications. KDD's corporate policy has always been to provide customers with a wide range of services of high reliability at prices that are economical. KDD has always looked to the market to determine customer needs and its concern for quality and reliability is shown in the duplication and decentralization of its facilities and equipment, multiple cable routes and around the clock network surveillance and management which are huge investments made to ensure high service reliability and availability even in the event of natural disasters such as earthquakes.

KDD is committed to providing state-of-the-art telecommunications services that meet modern needs through a varied range of telephone, video and data services to meet the customers' diverse needs. The services are backed by KDD's

<sup>15</sup> Source: KDD Annual Report, 1995.

extensive global network and around the clock network surveillance and management system. Services offered numbered several dozens.

KDD had played a major role in the Inmarsat-P project from its initiation. In May 1995, the 21 companies involved in Inmarsat-P established the Satellite Phone Japan Limited to spearhead the plan's implementation in Japan. KDD invested 53.2% in the company and would take a lead role in managing the company and promoting its services<sup>16</sup>.

### **Research and Development<sup>17</sup>**

KDD is also very active in research and development to prepare itself for the multimedia technology of the future. Research and development projects include transmission technology (e.g., optical amplifier and optical soliton transmission for ultrahigh speed transmission), network technology (e.g., broadband and intelligent international network, and ATM) and service related technology for:

- Speech recognition, language translation and speech synthesis for telephone extension guidance systems and machine translation systems;
- Video codecs capable of highly efficient video transmission over ATM networks and high definition television transmission;
- Compact, portable station systems in satellite communication;
- Collaboration systems which allow people to work together over telecommunication lines;
- Multimedia on demand; and
- New communications applications that use the Internet.

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<sup>16</sup> Source: KDD Annual Report, 1995.

<sup>17</sup> Source: KDD Annual Report, 1995.

## 5. COMMON PATTERNS OF COMPETITIVE CHANGES AND THEIR LESSONS

### **TREND IN TELECOMMUNICATIONS INDUSTRIES**

#### **Liberalization/Deregulation**

##### Privatization

There was a time throughout the world where telecommunications services were provided in each country by one or two monopoly carriers (e.g. AT&T in the US, BT in the UK, NTT and KDD in Japan). Such carriers were usually owned by the government and operated as state agencies, often as part of the postal services. (Note: AT&T is an exception, being a private monopoly).

Beginning in the 1980's and continuing into the 1990's, the telecommunications industries in almost all countries have experienced liberalization and deregulation in the form of privatization, some form of corporatization, or are in the process of corporatization or privatization. The reasons for privatization or corporatization were a combination of political considerations (e.g., wanting the citizens to have shares in the corporatized carrier, pressures from foreign countries to open up market for competition) and economic considerations (e.g., to improve efficiency and increase service levels or to facilitate raising the capital necessary to modernize and build up the network).

##### Regulation of Dominant Carriers

Owing to the fact that the incumbent monopoly operators are strong in the marketplace to unfairly undermine competition, countries which have liberalized the industry will inevitably set up regulators who are tasked with the responsibility of ensuring a level playing field and encouraging competition. There is the tendency that the regulators will come up with restrictive regulations applicable to the dominant carriers while their fellow competitors may be waived of such requirements or are required to meet in a less stringent environment. Very obvious examples of such restrictions are the regulatory experience of AT&T and BT. In the case of Singapore Telecom, it also has its fair share of such experience with its regulator, TAS.

In a sense, managements in the dominant carriers feel victimized. They find that they have to cope with more rules and regulations than ever before even though this is supposed to be deregulation. It is no wonder that they view privatization as “piratization”. Because of the regulators’ obsession for introduction of new competitors and the competitors’ more than fair chance for continued financial success, representations from the dominant carriers to the regulators usually are of little success.

### **Increasing Competition**

In most countries, privatization/corporatization of the dominant carriers has been accompanied by the introduction of competition. The competition usually starts in the customer premises equipment, value added services, mobile cellular and paging market segments.

Exhibit 5-1 shows the transitional phases of dominant carriers from monopolistic market to competitive market environment. The pace of change has also accelerated. The transition took about two decades in the US, one decade in UK. For the case of Singapore Telecom, it has till the year 2007 before full competition sets in.

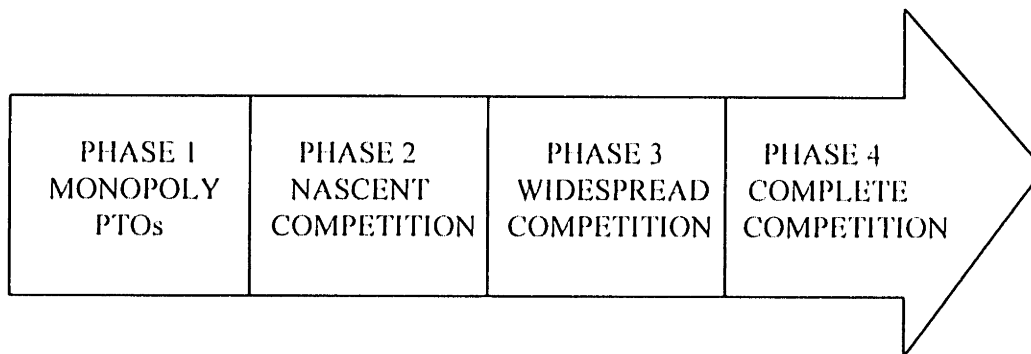


Exhibit 5-1: Transitional Phases of Competition

Presently, the situation in US and UK could be classified as in Phase 3 while Singapore is definitely in Phase 2. Germany and France may be classified as in Phase 1. In Phase 4, there will be complete competition and at that time the

Information Age would have dawned on us where the convergence of telephony, video, radio, broadcasting, cable television, computing technologies have merged together. All the conventional industries involved in entertainment, information services and software are expected to be competing against each other. To ensure the continued growth, each carrier has to bear the all-out competition with untraditional potential competitors in mind.

#### Entry into Information Technology Services

As dominant carriers face the prospect of revenue erosion from competition as well as the convergence of computer, communication, entertainment and broadcasting, dominant carriers enter into new information technology based services. Dominant carriers risk making losses if they are not careful as such entries into new technologies have their inherent risks. An example is AT&T shutting down its EO Inc. unit. AT&T closed EO, which tried to pioneer a wireless communicator, because of an inability to raise new capital<sup>1</sup>. EO's machines, which combined facsimile, electronic mail, telephone and personal computer capabilities in a mobile device, were among the first of their kind, but potential buyers found them expensive and difficult to use.

#### High Chance of Decline in Market Share/Revenues

As dominant carriers start out with 100% or near 100% market share, the advent of competition automatically means a decline in the market share from the very beginning. In some cases, the dominant carriers could experience a decline in market share and revenue over a long period of time.

It was reported in BT's Press Release for the first quarter results to June 30, 1995 that increasing competition and price reductions continue to affect the financial results. For example, the price cuts made with the introduction of per second pricing, are worth over £300 million to customers in a full year and have an impact on its results in subsequent quarters.

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<sup>1</sup> Source: ProQuest - The New York Times (R) Ondisc, August 11, 1994.

When Singapore Telecom's commitment to maintain its competitive edge in the international telephone business led to three rounds of tariff reduction in 1994, reductions did not stimulate sufficient incremental international call volume to completely offset the revenue loss from the tariff cuts.

### **More Sophisticated Customers**

There used to be a time when customers were satisfied with just the plain old telephone service. Now, a telephone is a necessity and telex and facsimile services are so conventional. Residential customers are looking for multimedia and on-line services while multinational corporations are demanding fully reliable high data speed transmissions, videoconferencing, virtual private networks, etc. Even on the conventional telephony service, customers are looking for advanced features like call waiting, call transfer, phone lock, conference call, call back, do-not-disturb etc. They require ease of access and operators have to provide international calling cards, and prepaid cards and credit cards service for public phones. In cellular mobile, customers are demanding compact and lightweight handphones with wide area coverage especially good in-building penetration.

In order to satisfy more and more sophisticated customers, dominant carriers have to continually think of innovative new services at affordable prices as well as providing a high standard of service quality. For example, services must make global communications simple for customers, offering access to the world through a single point of contact, a single point of support 24 hours a day, seven days a week. This is the so-called high-quality, seamless service and one-stop shopping which multinational corporation customers expect.

### **Rapid Changes in Technology**

As mentioned the convergence of telecommunications, computing and broadcasting will lead to all the conventional industries involved in entertainment, information services and software competing against each other in the future. However, technology has started playing its role by facilitating the low barriers of entry to new competitors. A classic case is the entry of MCI which was formerly Microwave Communications Inc. The introduction of very small aperture terminals



(VSATs) for satellite communications coupled with the proliferation of many private satellite operators has imposed threat of bypass to international leased services offered by dominant carriers. Another case in point is the advent of facilities resellers made possible by technology.

The rapid change of technology means that dominant carriers are disadvantaged vis-à-vis their competitors as the competitors can invest in new and advanced technologies whereas dominant carriers will have to manage the old technology as well as modernize their network infrastructure. It also means that all operators have to be innovative in service provision to capitalize as much as they could during the ever decreasing life cycle of the technology underlying the services.

## **RESULTS OF COMPETITION**

Before the advent of competition, the organization of dominant carriers usually are hierarchical with tight management control and functional isolation. The corporate culture is one of non-responsiveness and a lack of urgency. In addition, the manpower level is normally over-staffed and managements are not particularly concerned about cost since monopolistic rent is assured. Hence dominant carriers enter the phase of competition with two disadvantages vis-à-vis the new entrants, i.e., a high cost structure impacting adversely on financial performance and internal coordination problems giving rise to lack of focus and poor customer services.

Introduction of competition leads to the following developments:

- Competition will force changes on the dominant carriers which are usually not lean and fit or competitive via restructuring, changes in corporate philosophy and corporate culture, better customer service and greater innovativeness in service provisions;
- Competition accelerates the introduction of new services and tariff reduction;
- Reduction in market share and depending on the specific cases, the drop in market share can be continual or reversed. Competition also exerts great pressure on the revenue as volume increase is usually unable to offset reduction in tariff arising from competition;

- More foreign and domestic capital will be attracted into the competitive telecommunications market mostly in the form of joint ventures - the advent of strategic alliances;
- The overall quality of life in society which requires modern telecommunication services is achieved through competition that attempts to achieve sustainable competitive advantages.

## **COMMON PATTERNS OF COMPETITIVE CHANGES**

From the review of the strategies adopted by the dominant carriers in the developed countries, we can see a common pattern of the competitive changes. They include:

- Restructuring;
- Globalization;
- Strategic alliance;
- Infrastructure modernization and development;
- Cost reduction, rationalization and productivity improvement;
- Continual service enhancement and new service provision; and
- Research and development.

### **Restructuring**

Competition forces previously complacent dominant carriers to formulate the vision to respond proactively to the needs of the customers as well as to be productive, reduce operating expenses and to be street wise vis-à-vis the competitors. Planning methodologies are needed to formulate the vision of the company. However, according to Hax and Majluf<sup>2</sup>, “ these planning tasks, although essential for the proper articulation of the overall directions of the enterprise, are insufficient alone to generate the massive mobilization of resources and the deep sense of personal commitment to make the vision a forceful reality that generates the desired changes in an organization”. As mentioned by Alfred Chandler,

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<sup>2</sup> Chapter 16, page 205, in *The Strategy Concept and Process* by Arnoldo C. Hax and Nicolas S. Majluf (Prentice-Hall, 1991).

structure follows strategy<sup>3</sup>. To imprint the vision of the company on all its staff, the organization and managerial infrastructure is very important and thus one of the first steps undertaken by corporatized or privatized dominant carriers is to undergo restructuring (e.g., AT&T, BT, NTT and Singapore Telecom) to position themselves for the future success. Associated with the restructuring is the emphasis on a change in corporate philosophy or culture through the induction of new personnel. It also involves the set up of a proper management control and information system.

### **Globalization**

Competition is now not only present domestically but also internationally. AT&T, BT and others have made it their corporate missions to become leaders in the world market for telecommunications services. The strategic direction to global leadership is the provision of a broad range of superior services in terms of features, tariff and customer services which meet the users' requirements regardless of national borders.

Globalization will have profound and far-reaching effects on dominant carriers and the competitive situation in most countries. Some of the effects of globalization include:

- intense competition for the business of multinational companies involving well financed foreign carriers and domestic competitors;
- national regulatory authorities will be subject to political pressures to open up their markets as international political issues become a factor in domestic regulation, thereby accelerating competition; and
- although access to capital, a widespread national network and pre-existing customer relationships may give a competitive advantage to the dominant carriers, these will not be sustainable as well financed foreign carriers enter and compete in the domestic market by cream skinning in areas which are profitable.

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<sup>3</sup> Alfred D. Chandler Tr., *Strategy and Structure: Chapters in the History of the American Industrial Enterprise*, (Cambridge, MA: The MIT Press, 1962).

Dominant carriers have to choose a globalization strategy which ensures their role in the globalization process. Without a globalization strategy, it is likely that domestic market share for multinational corporation business would be eroded as foreign carrier competitors would take away market share. One example of this kind of competition for Singapore Telecom is the award of a contract to BT by the personal computer giant, Acer Computer International (ACI), to meet global networking requirements in its market which covers Asia Pacific, CIS, the Middle East and Africa<sup>1</sup>. ACI is a Singapore-based regional headquarters of the Acer Group responsible for the sales, marketing, service and assembly of Acer computers in Asia Pacific, Africa, CIS and the Middle East. Under the contract, covering five years, ACI's worldwide network of offices will be connected through BT's Concert Global Managed Data service. Before the advent of global competition for multinational corporation telecommunications business, this business would have naturally gone to Singapore Telecom.

### **Strategic Alliance**

The global competition will be played by the major carriers in alliances with strategic partners in the arena of services to multinational corporate customers. The world's biggest telecommunications carriers are grouping into a few huge alliances to market global corporate networking services. In Europe, for example, France Telecom and Deutsche Telekom have already formed Eunetcom, which currently provides long-distance communications. And Telecom Netherlands, Telia of Sweden and Swiss Telecom have formed a consortium called Unisource. AT&T has formed its own consortium, called World Partners, which includes KDD, Singapore Telecom and others. BT and MCI have formed their own Concert alliance and Deutsche Telekom, France Telecom and Sprint have formed the Global-One alliance. In Europe, AT&T has been seeking alliances with various companies, including France Telecom and Deutsche Telekom, but has been unsuccessful

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<sup>1</sup> Source: BT's News Release, August 30, 1995.

because of concerns among the companies and European regulators that AT&T's size would allow it to dominate any partnership.

### **Infrastructure Modernization/Development**

As the new entrants will invest in modern and advanced network infrastructure, to compete for sustainable growth, dominant carriers have to upgrade and modernize their networks too. This is also a natural response to the increasing number of sophisticated customers demanding modern and advanced services.

### **Cost Reduction/Rationalization/Productivity Improvement**

This is an automatic response to competition and usually is done in tandem with restructuring. However, it is not easy to implement as excess employees have to be retrenched, the right set of work ethics inculcated, the correct corporate culture widely disseminated and the employees well trained and competent to serve the customers.

### **Continual Service Enhancement/New Service Provision**

Service is the final output of the dominant carriers which will translate into revenues and profits. It is important that the more and more sophisticated customers are attracted to a wide range of diversified and value for money services. A high standard of service provision is critical for the success of dominant carriers.

### **Research and Development**

Many dominant carriers are involved in research and development for new services of the future which include multimedia, interactive and personal services supported by such technologies like fiber optic, ATM, BISDN, AIN, etc. However, research and development is very costly especially basic research and those dominant carriers without competitive advantage in research usually conduct field trials or pilot projects in collaboration with strategic partners.

## **LESSONS LEARNED**

The pattern of the experiences of dominant carriers worldwide provided the following lessons for the managements of dominant carriers in countries about to liberalize their telecommunications industries or in the early stages of the

liberalization process. Singapore Telecom has all along been aware of the following lessons:

- Manage the change

Dominant carriers should not take too long a time to change as competitors will only be too happy to be given enough time. Dominant carriers have to take the risk of making mistakes and send the right signals to customers and competitors about their commitment to remain a leader in the telecommunications industry. Thus they should quicken change and not resist change. Managing change is important especially with regard to employees' anxiety and uncertainty. The combined effect of operating under a high cost structure, yielding market share to competitors by not responding fast enough, not responding to opportunities and experiencing false starts would be costly. In the process of managing change, the corporate philosophy and culture have to be changed too since a company with a philosophy or culture not congruent with the vision will be doomed to failure. Changing the culture takes time and new blood needs to be inducted particularly in senior and middle management. Employees also need to be continually imbued with the need for a positive set of culture values.

- Emphasize a low cost/high productivity operating structure;
- Hire, promote and retain good talents;
- Invest in the operating support and billing system

Investment in an advanced operating support and billing system is crucial for better customer service quality. A good system will cut down on transaction time and facilitate one-stop shopping. As customers become more sophisticated and cost conscious, detailed itemized billing is a must and just for this, huge investment is needed and the replacement process takes at least two to three years. If done correctly and quickly, the new system will provide a competitive advantage. As a bottomline, dominant carriers have to have advanced system to match those of competitors which will enter the business with new customer oriented business support systems.

- Maintain a global perspective

Going into foreign markets poses many risks and for the globalization strategy to succeed, multicultural managers with a knack for “managing at the frontier” is needed. They must have enough support from headquarters and are “localized” in the country of operation. Dominant carriers must also be patient as such foreign investment will take time before the project pays back. Lastly, globalization is very risky and dominant carriers should thus focus its globalization approach for beneficial integration and synergy.

- Avoid friction with the regulators and concentrate on the business

When competition matures, the restriction on dominant carriers will proportionately reduce (e.g., AT&T has been relieved of price control in 1995). However, dominant carriers usually fall to the temptation of trying to influence or lobby the regulators to seek regulatory relief. Worse still, being formerly part of the governmental structure, some dominant carriers may feel condescension, if not derogation, when dealing with the regulators and refuse full cooperation with the regulators. On its part, Singapore Telecom had been accused unofficially of non-cooperation towards TAS in the early stage after its corporatization. Dominant carriers have to understand the role of the regulators and take note that the regulatory process would become less relevant as competition increases. It is more productive to concentrate on the future business rather than the unproductive fixation with regulatory restraints.

- Adopt a proactive network investment strategy

If a dominant carrier has a reactive investment strategy, risk will be avoided at the expense of early to market. Competitors will also be able to follow suit in providing the new service. The proactive approach will be able to put dominant carriers in a competitive position but of course it is riskier. Given that application generally comes after technology and that smaller competitors are better risk takers, it is justified in adopting a technology-push strategy instead of a demand-pull approach to network investment. However, it does not mean recklessness on the part of management but rather good risk management. Field trials or pilot

projects on new technology could be conducted and appropriate alliances with the parties with the relevant expertise should be initiated for risk sharing. Experiences from other developed countries on the new technology should act as useful reference. An example of the latest technology which could have a future potential is interactive video which is presently under trial by BT and Singapore Telecom. However, it could be too early for interactive technology trials because equipment and software are not ready as evidenced by the delayed trials in the US.

## **CHALLENGES**

The challenges to the dominant carriers are many. First, they must ensure that they beat their competitors at the domestic market. Second, they must manage their international business well. Third, they must not fall into the pitfalls as outlined in the above section on lessons learned. But most difficult of all is to fire up the employees, especially the top management for new innovative ways of continually improving all aspects of the operations of the organization.

The challenges faced by the dominant carriers are translated into how well they cultivate and nurture to possess the critical success factors. The critical success factors are identified in the next chapter.

## **SUMMARY**

Faced with the external environment of liberalization, increasing competition, more and more sophistication on the part of customers and a rapid change of technology, one sees a common pattern of competitive changes where dominant carriers come up with a set of strategic thrusts. The whole situation is modeled as shown in Exhibit 5-2.



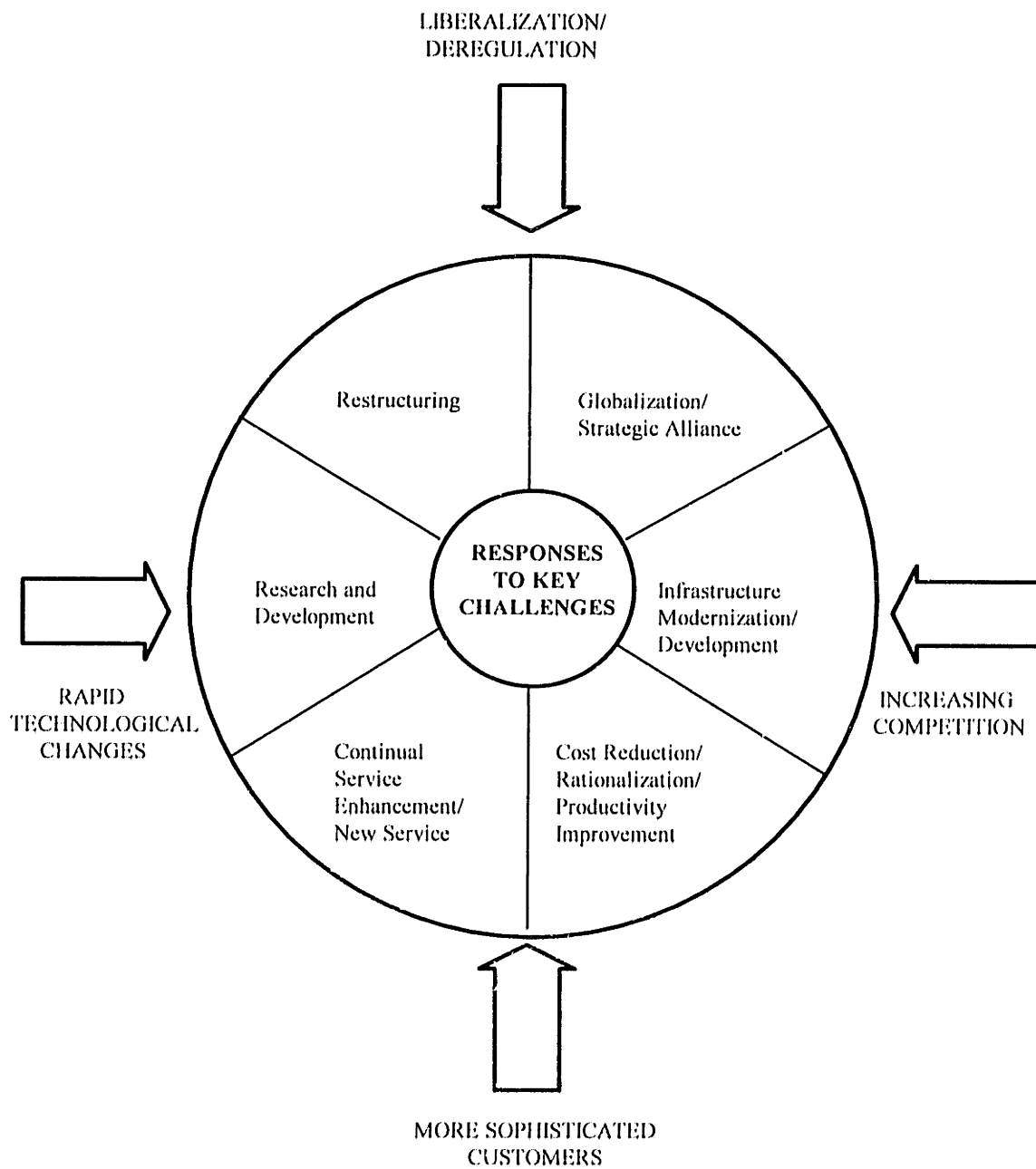


Exhibit 5-2: Strategic Thrusts in Response to Tougher Environment.

## 6. CRITICAL SUCCESS FACTORS FOR DOMINANT CARRIERS

### VALUE CHAIN

What are the critical success factors for a dominant carrier to compete with new entrants and to ensure that there is sustainable growth in the future? In this chapter, I shall attempt to identify some of the critical success factors which are important for the superior performance of a dominant carrier using Michael Porter's Value Chain as a framework for identification (see Exhibit 6-1 below).

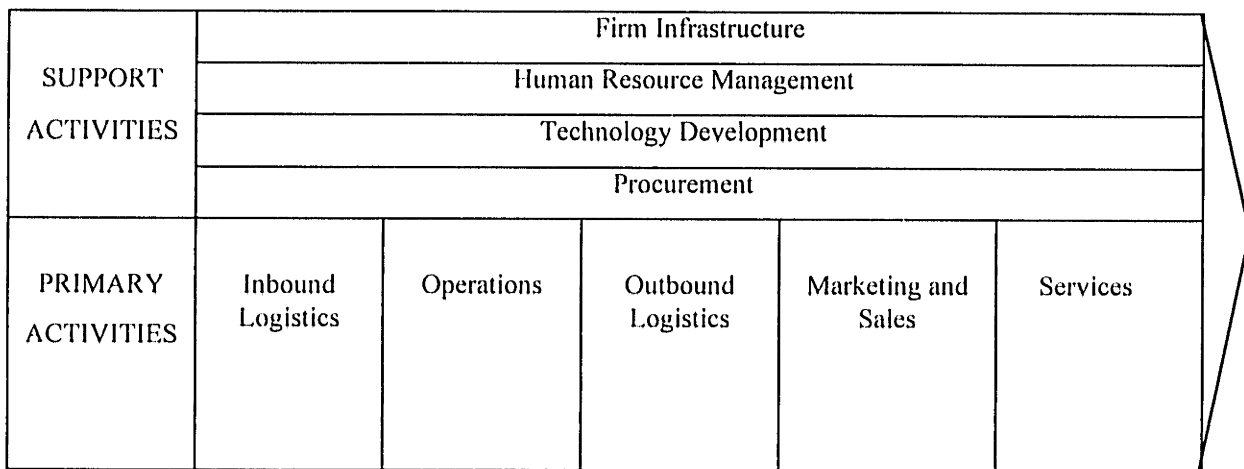


Exhibit 6-1: The Value Chain<sup>1</sup>.

Critical success factors are internal capabilities for which the company must excel to achieve long term competitive advantage. Twelve critical success factors have been identified. Under the firm infrastructure of the value chain, five critical success factors ranging from Management Vision/Strategy to Finance are deemed critical to be identified distinctively. Inbound and outbound logistics of the value chain lead to one critical success factor i.e., Network Infrastructure and Support System. Of course, sub-categorization is possible within the remaining critical success factors but they are not distinctively identified in this thesis though they are being discussed. The following paragraphs present a situation where success of a dominant carrier depends on the twelve critical success factors interacting in a competitive liberalized market environment as modeled in Exhibit 6-2.

<sup>1</sup> Source: Michael E. Porter, Competitive Advantage, 1985.

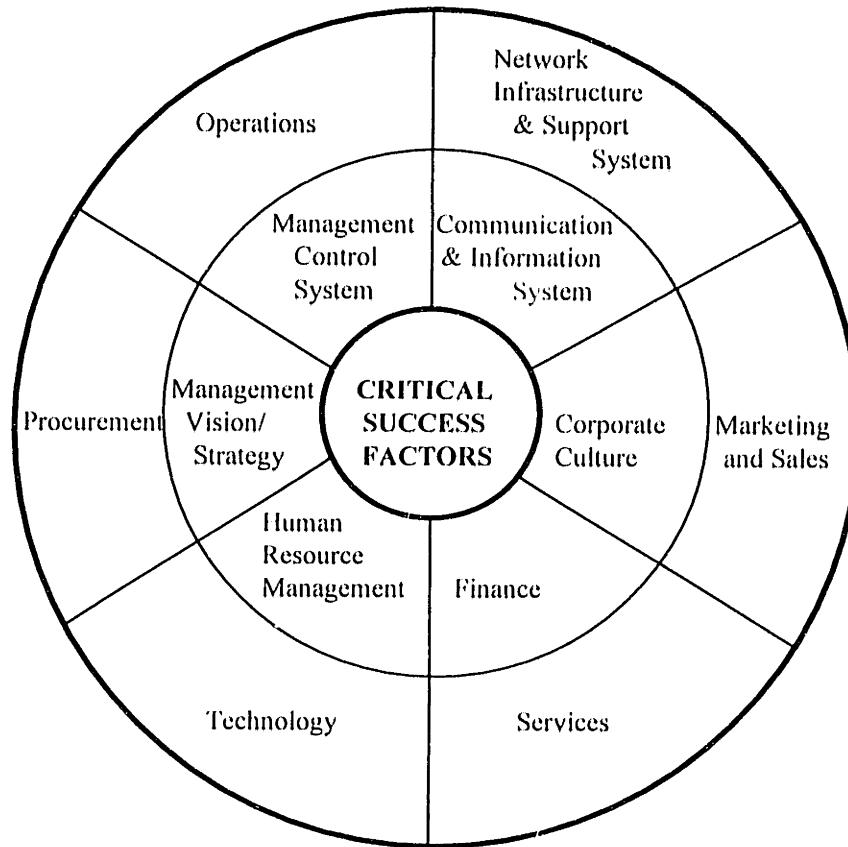


Exhibit 6-2: Critical Success Factors.

## MANAGEMENT VISION/STRATEGY

A dominant carrier will be successful when top management has a market-oriented and competitive vision supported by a congruent set of corporate philosophy, culture and organizational capabilities. The first step of coming up with a vision is the articulation of the mission and objectives together with the strategy for sustainable growth. A systematic approach to strategy formulation is important, i.e., a planning system has to be in place as what is important in strategic management is the process. A process where interactive inputs from the managers of all strategic business units (SBUs) are available through brainstorming sessions is in my opinion the best approach.

## MANAGEMENT CONTROL SYSTEM

In other to have a closed loop to provide feedback to top management about the performance of the firm's strategic thrusts, a reliable, timely and accurate

management control system is a critical feature. Such a system will not only provide benchmark and performance measures to dynamically fine-tune the firm's strategic position, but also it will act as an accountability and reward framework so that the relevant stakeholders' performance can be appraised and rewarded or reprimanded.

As service quality is critical to the continued success of dominant carriers, a service quality system should be in place where frequent customer complaint solicitations, customer interviews or surveys, employee surveys, etc., could be carried out and analyzed.

### **COMMUNICATION AND INFORMATION SYSTEM**

As the firm has to act in a coordinated way and customer service responsiveness will be a competitive advantage, an advanced communication and information system is necessary. A dominant carrier without a LAN or WAN infrastructure to interconnect its widely distributed domains of work will definitely be less productive. A good information system with a comprehensive customer database will go a long way in providing superb customer service in terms of reliability, responsiveness, and ease of access for service provision.

### **CORPORATE CULTURE**

In the monopoly phase, a dominant carrier's culture is generally reactive. Lack of competition nurtures a bureaucratic mindset, limits creativity and innovativeness and sets up an inward-looking culture. With bureaucracy, there is lack of empowerment with the corresponding lack of individual accountability and employees are risk averse. In a monopolistic phase, the organization is usually engineering-oriented rather than customer or market-oriented. The cost and availability of technology determine the network that determines what services will be available to customers. Another manifestation of being engineering-driven is the provision of redundancy without concerns for cost to the customers in order to ensure extremely high reliability.

As competition emerges, carriers have to begin emphasizing those services that customers wish to buy. A winning corporate culture is one that is proactive and

flexible to changing circumstances. The culture of a successful carrier will also willingly benchmark itself against the performance of its competitors or other comparable industries for total quality service, able to manage risk taking and emphasize the accountability of management. Changing the culture of a corporation is a difficult task and usually many members of top and middle management staff would be replaced with new people from outside who will facilitate the development of a new corporate culture. A cultural change is important as culture is a vehicle that transforms vision into actions.

The corporate culture of a successful dominant carrier should be one where the employees feel motivated and empowered to make decisions and there is delegation of work. The staff is imbued with a sense of urgency rather than being indifferent or easy going. There is emphasis on marketing to meet customers' needs rather than backroom functions. Management accountability and financial awareness are prominent among staff. Employees are happy to work in teams to create synergy and have a sense of ownership. They must also be able to take calculated risks.

## **FINANCE**

In the monopoly phase, dominant carriers follow a low risk financial strategy which charge customers high economic rents. For the dominant carrier to succeed in a competitive environment, the financial strategy should match management's vision. How the financial health or situation is going to support the acquisition, merger or divestment, are important considerations. Equally important is the need for tax and risk management e.g., exchange rate risk management arising from the globalization activities of the company.

Dominant carriers also have to put emphasis on working capital management. As competition emerges, dominant carriers need capital to do one or all of the following:

- accelerate investment in the network to meet competitors' challenge as they use state-of-the art technology;
- make acquisitions or mergers;

- invest overseas to achieve greater growth rate; and
- pay for restructuring cost.

As access to capital would be rationed since investors are no longer sure there is guaranteed monopolistic profits or such access has been cut off from the governmental budget, management must learn how to manage in a capital rationing situation.

## **HUMAN RESOURCE MANAGEMENT**

Dominant carriers enter the competitive phase with an overstaffed organization that is ill-equipped for competition. The excess in management and staff creates a high cost structure that is disadvantageous as well as difficult to coordinate internally and thus reduces customer responsiveness. This downsizing process to become lean and nimble has to be effectively managed due to the adverse effect of distraction of the staff focus from how to best serve the customers.

### **Appraisal System**

A fair performance evaluation is critical in competing against rivals for superior performance as it will motivate the employees. An open appraisal system is attractive for its transparency and immediacy of the feedback. During the grading, supervisors are expected to compliment subordinates and refer to areas for improvements. Specific objectives are emphasized with sign-off by both employees and supervisor on annual performance objectives. Promotion and career planning should be a part of the corporate philosophy.

### **Reward System**

It should be borne in mind that compensation should be linked to performance evaluation and objective achievement for effective employee motivation. This is in contrast to that in the monopolistic phase where dominant carriers generally do not practice performance linked incentives or objectives. As importantly, the reward system has to be seen as equitable by the employees. The choices for compensation and benefits should include at least the following:

- Profit Sharing;
- Gainsharing;

- Individual Sales Commission; and
- Team-based Performance Bonus.

### **Labor/Employee Relations**

It is important that the firm does not suffer from internal slack which will appropriate the fruits of the firm's strategic positioning. A cordial industrial relationship with the employees and/or unions is important. This cordiality can be built upon mutual trust and employee empowerment. As change is a constant in the future, staff will be subject to many uncertainties. The range of choices to combat uncertainty amongst the workforce with the attendant problems of low morale, anxiety and fear, and mistrust is to empower the employees through:

- Teams

To create a conducive workplace, dominant carriers should organize the workforce into self-directing teams. A range of choices can be made: functional, cross-functional, and multi-functional. Such teams can be involved in TQM or quality circle projects. The advantages of teams are: reduce blaming, increase problem solving because of shared knowledge and responsibility, and increase teamwork for higher productivity.

- Involvement in Decision-making

The process of involving labor participation in decision-making will increase employee buy-ins.

### **Selection/Placement**

Besides promotion and career planning, human resource departments should look into the induction of new blood into the company for fresh perspectives and desired skills for continual self-renewal. This is opposed to the practice in the past where dominant carriers tend to be closed to outsiders.

Reliance on the employees for competitive advantage means that the selection process for new personnel should be stringently and selectively carried out. A selective process not only helps in the performance of the company, it also makes the successful applicants motivated that they are joining a solid company, thereby enforcing their performance standards.

## **Training and Development**

Another aspect of human resource management is training and skill development. Continual training of the employees is important especially multi-skill training to develop and prepare staff for future changes, job enlargement, manpower redeployment and higher responsibility within the organization. This is opposed to specific training and specialization in the monopolistic phase.

## **TECHNOLOGY**

### **Selection/Timing**

Traditionally, a dominant carrier invests in a network technology mainly based on cost. This approach leads to a long depreciation period for the capital investment as well as a long planning horizon. With competition, investment in technology must be for facilitating the provision of new services in niche markets. The network technology must be interactive and/or multimedia-based and not just supporting plain old telephone services. The technology has to be personal, intelligent, digital and accompanied by increased customers' control instead of carrier-controlled. In order to achieve the above, services which are traditionally line-based will increasingly be offered over wireless means (e.g. cellular mobile substituting for the local loop) and services traditionally offered over wireless will be offered over land lines (e.g. cable television or interactive video substituting for broadcast television).

Furthermore, the timing of introducing the technology into commercial service is very important due to the rapid changes in and short lifespan of technology as well as uncertainty in market demands. Gone are the days of stable technology in the telecommunications industry. The opportune timing of technology introduction can be ensured through field trials or pilot projects to gauge the customer demands, system economics and technical feasibility.

### **Strategic Technology Units**

In addition, dominant carriers should institutionalize its technology strategy to link their technologies with their business strategies. A concerted effort should be



launched to identify strategic technology units (STUs) to ensure the companies have the appropriate technologies through<sup>2</sup>:

- technology environmental scan to gather technology intelligence, opportunities and threats;
- technology internal scrutiny to identify weakness and strength; and
- formulation of technology strategy and action plans e.g., research and development plan or field trials.

## **PROCUREMENT**

In the monopolistic phase, dominant carriers are either tied to a few specific suppliers or if they practice competitive biddings, the evaluation time is long due to superfluous or unclear specifications and requirements. To provide the best services to its customers both domestically and globally in a competitive environment, as well as to enhance business efficiency and productivity, dominant carriers should procure a wide range of high quality, reasonably priced products from suppliers all over the world. Competitive procurements based on public announcements of Request for Proposals (RFPs) would ensure fair and open procurements.

Competitive procurement does not mean, however, that dominant carriers have to work with suppliers on an arm's length relationship. Far from it, dominant carriers should work closely with suppliers in order that suppliers would know the dominant carriers' needs so that the lead time of procurement could be reduced which is critical for fast provision of services. Rather, worldwide procurement through competitive RFPs means that there are no guaranteed suppliers, e.g., the relationship between France Telecom and Alcatel in the past.

The RFP process must be shortened to facilitate speed of service provisioning. This can be facilitated by short evaluation time arising from clear and concise specifications or requirements as well as good project management.

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<sup>2</sup> For a detailed exposition on this subject, see "Linking Technology and Business Strategies: A Methodological Approach and an Illustration" by Arnaldo C. Hax and Manuel No in Perspectives In Operations Management, Kluwer Academic Press, 1993.

Lastly, the importance of project management in the procurement process cannot be over-emphasized. Good project management will ensure that network infrastructure is procured and commissioned in time for quick service provision and especially important. first to market.

## **OPERATIONS**

As competition increases, the dominant carriers have to automate or use new technology to become more efficient or productive and less labor intensive. This can be achieved by getting out of labor intensive lines of business such as outsourcing the laying of outside plant cables and on-premises line installation as well as network digitalization. Introduction of new technology can take many years and dominant carriers should plan ahead. For example the digitalization of Singapore Telecom's switching network was started in 1985 and it achieved 100% digitalization only in 1994, even considering the small size of Singapore.

Management should go for useful performance measurement or benchmarking like profitability by line of business, competitors' market share, cost of services, etc., instead of trivial measures in the monopolistic phase which are usually biased towards network performance measurement. Without accurate information, management would not be able to strategize for the future. In this aspect, an advanced support system is also important.

## **NETWORK INFRASTRUCTURE AND SUPPORT SYSTEM**

Network infrastructure is the incoming logistics to support the dominant carriers' operation in order to provide the requisite service to the end-users. A modern network infrastructure incorporating the appropriate technology that is flexible enough to provide innovative new services opportune for its time will ensure competitive advantage to the dominant carriers. This factor is thus closely related to the technology factor.

Support systems include such systems as order entry, provisioning, customer service records and billing. In order to provide the level of service that customers expect, a sophisticated support system is a must. For example, the billing system must be able to provide itemized detailed billings which are desired by customers

especially those with large accounts. It must also be open and flexible to facilitate customer service since customers' needs are varied. It must be able to support the provision of new services. When a new service is offered to customers, the billing system should be flexible enough to charge the customers under a requisite tariff structure.

## **MARKETING AND SALES**

As the dominant carriers start with 100% of the market share before the start of competition, there is only market share to lose. A well managed dominant carrier realizes that it is important to put more emphasis on marketing and establishing a good relationship with large customers. Through continuous visitations or telephone contacts, it can understand better the needs of the customers lest its competitors persuade them to change carrier due to their offer of better services which meet the customers' needs. Thus as opposed to the monopolistic phase where customers apply for service, direct marketing and sales to customers, especially the multinational corporations, are critical.

Furthermore, the marketing and sales should not be restricted to just the domestic market but have to be extended also to the global arena. As the needs of customers have to be addressed quickly in a competitive environment, the provision of new services is critical. However, new services are risky since they are mostly network based and need huge investment. Aside from the technological risk management already alluded to before, an effective marketing research will help to reduce the technological risk.

Pricing is an important element of the marketing strategy. With the implementation of a lean and nimble organization with corresponding increase in quality productivity, the dominant carriers should be able to charge attractive prices for comparable services vis-à-vis their competitors'. Cross subsidized pricing definitely has no place in a competitive environment and dominant carriers have to think of market based pricing.

## SERVICES

Lastly, the end-product of the value chain is crucial for sustainable superior performance. In a competitive environment, dominant carriers should offer innovative, diversified, value for money services and products which meet the needs of their customers. This is opposed to the monopolistic phase where services are based on technology instead of based on customer needs. Emphasis on new service provision as an engine of growth is needed.

In the final analysis, the quality of service is the final arbiter of continual superior performance. Aside from value for money, all the five dimensions of service quality, i.e., reliability, tangibles, empathy, assurance and responsiveness must be considered. Assurance of the service encompasses competence of the service personnel, courtesy, credibility and security whereas empathy involves ease of access, communication and understanding the customer. Of all the dimensions which are important, the quality of the service in terms of reliability is deemed the most important<sup>3</sup>.

An important aspect of managing quality is the matching of customers' expectation with their perception of service quality. In the Gap Model of service quality (see Exhibit 6-3), the cause of the mismatch in expectation and perception can be identified and rectified.

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<sup>3</sup> See the Report No. 93-104, May 1993 of the Marketing Science Institute, Cambridge, Massachusetts, "Ten Lessons for Improving Service Quality" by Valarie A. Zeithaml, A. Parasuraman and Leonard L. Berryl,

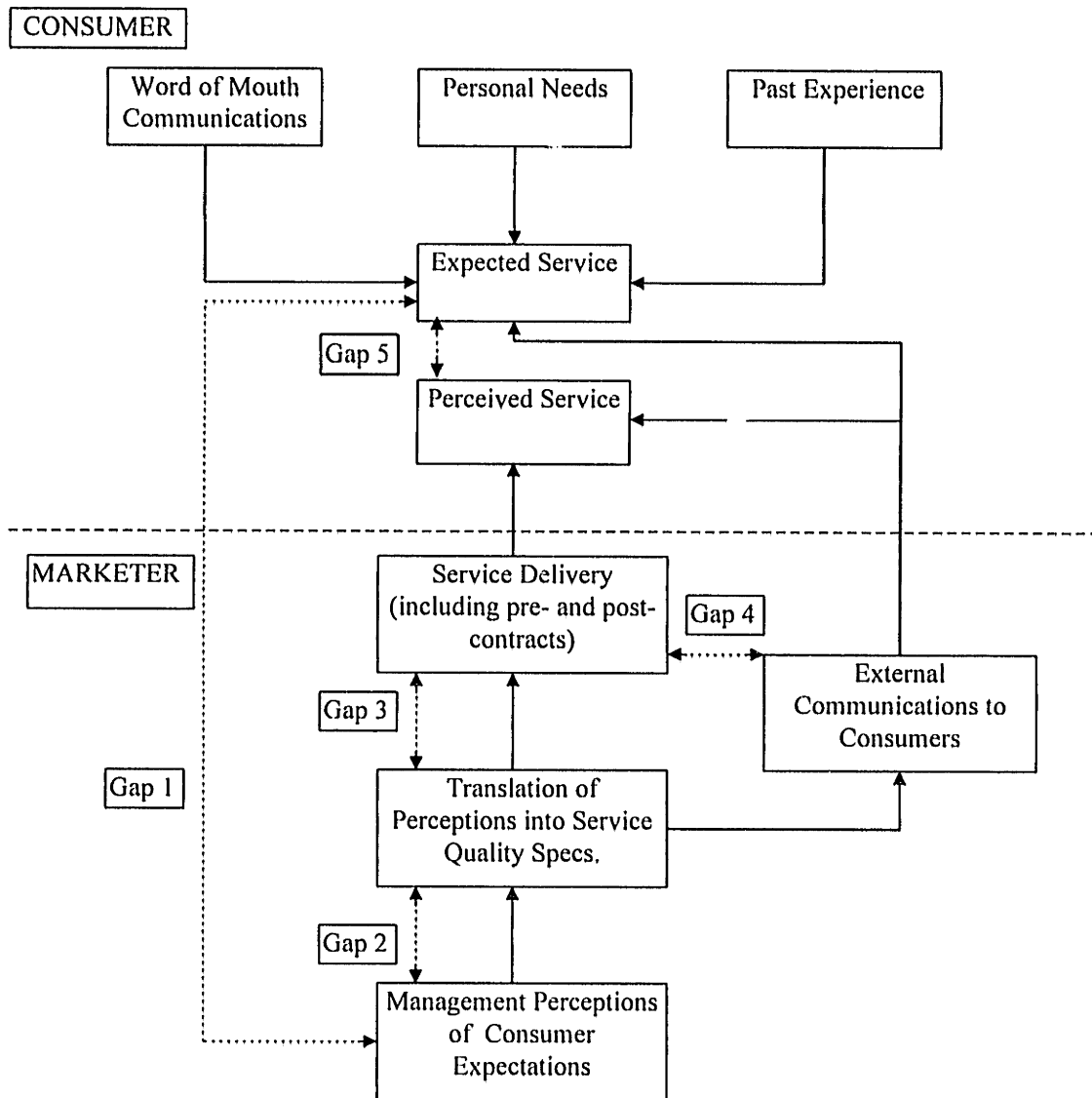


Exhibit 6-3: The Gap Model of Service Quality<sup>4</sup>.

## SUMMARY

In this Chapter, the critical success factors which will ensure the sustainability of superior performance in the dominant carriers are described and the desired characteristics pertaining to them are elaborated.

<sup>4</sup> Source: "Delivering Quality Service: Balancing Customer Perceptions and Expectations" by Valarie A. Zeithaml, A. Parasuraman and Leonard L. Berry (1990), New York, The Free Press.

## 7. STRATEGIES OF SINGAPORE TELECOM

### CHALLENGE TO MANAGEMENT

The worldwide trends in the telecommunications industry are deregulation and competition. The operating environment has undergone tremendous changes and Singapore Telecom faces greater competition both locally and internationally. It is critical for Singapore Telecom to prepare for the impending competition both at home and abroad. Singapore Telecom expected that its operating margin would be under pressure, or worse still eroded, consistent with the situations in other countries where the telecommunication market had been liberalized.

### STRATEGIC MANAGEMENT FRAMEWORK

I would like to proceed to review Singapore Telecom's strategic thrusts using a strategic management framework which would show clearly the inter-relationship of all the activities carried out by Singapore Telecom. The framework is based on Arnaldo Hax's model as shown in Exhibit 7-1.

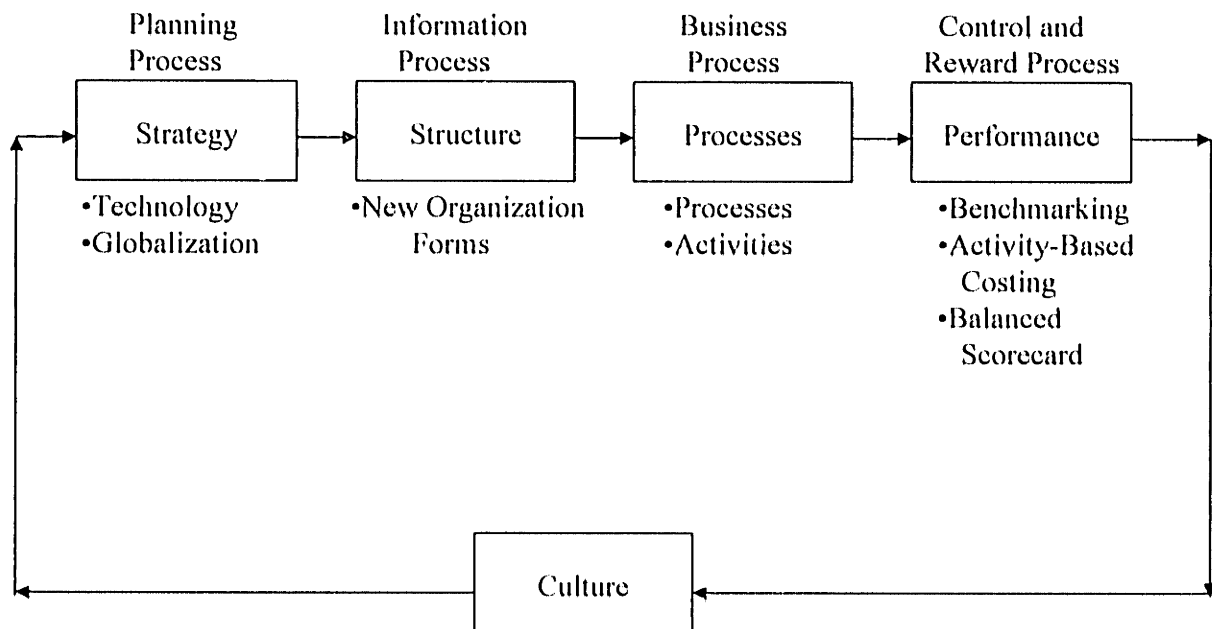


Exhibit 7-1: Strategic Management Framework.

## STRATEGY FOR SUCCESS

Singapore Telecom's strategy has always been to meet the competition head on so as to remain profitable and to sustain reasonable growth. Its competitive strategy is deceptively simple; to control costs through internal efficiencies and at the same time offer a broad range of products and services that its customers want and need at a fair price supported by a world class infrastructure and service. It emphasizes the need to pursue consistent growth over the medium and long term. The present financial performance had been the result of investment and strategies which were initiated some time ago e.g., its investment in mobile communications had make it the fastest growing area of its business.

Singapore Telecom ensures that its customers enjoy the best possible services by making a conscious effort to listen to their feedbacks through formal surveys or other means. This process helps it to identify the customers' needs and allows it to stay competitive. At the same time, internally, it improves and streamlines its operations and procedures constantly.

In a competitive environment, it is critical to be tariff competitive. Singapore Telecom's policy is to price its services among the lowest in the world and to pass savings achieved through efficiency and productivity back to the customers.

Flexibility to adapt to changes is necessary for survival and the speed and responsiveness of the organization to adapt will clearly impact its performance and ultimate success. It is also vital to be constantly looking ahead at tomorrow's technology and planning for tomorrow's needs. Singapore Telecom is investing in new technologies. These technologies will enable Singapore Telecom to provide new services.

"... we will strive to become a more efficient, more productive and more market aggressive Singapore Telecom. We will demand the very best from each staff member as we become a more driven and leaner organization. We aim to be an outstanding organization in every respect. We want to be an organization that every staff member will be proud of. In the coming years we aim to make Singapore a recognized communication hub by providing services at the highest level of

quality and reliability at internationally competitive prices. At the same time, we aim to achieve financial returns sufficient to meet infrastructure investment that will keep Singapore at the leading edge of telecommunications technology and services,” commented Singapore Telecom Chairman, Mr. Koh Boon Hwee<sup>1</sup>.

Touching on globalization, Mr. Koh said in April 1992<sup>2</sup>:

“We have three million people in Singapore. Our network has more than one million lines. The reality is, no matter how hard we all work, we will not be able to expand our company faster than our population growth. Singapore Telecom has been enjoying growth of 8% a year. If we do not globalize our operations, domestic activities alone will not enable us to grow at the rate we used to. If we grow at only 2 or 3 per cent a year, it would mean less investment to improve our existing network and infrastructure and less opportunities for our staff.”

There is a final dimension to Singapore Telecom’s competitive strategy and that is to build on its strength while recognizing its weakness. If there is lack of capability or experience in a certain area, it would look for partners or alliances that can provide these resources.

In summary, Singapore Telecom adopts the strategy very similar with those adopted by other dominant carriers in other countries. It continues to provide a broader range of products and services and enhance its network capabilities through innovation and R&D; to compete with others in their own countries i.e., globalization through strategic alliances or otherwise; to continue to increase productivity, reduce inefficiency and operational cost in order to remain competitive. This is done through reorganization, incentive awards, corporate philosophy and culture change, and tariff rationalization. At the same time, it tries to learn from the lessons in other countries, in particular, it makes sure that the relation with the regulator, TAS, is not adversarial and that it embraces wholeheartedly the inevitability of change in the liberalization and competition arena.

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<sup>1</sup> Source: Singapore Telecom staff newsletter, Hello, August 1989.

<sup>2</sup> Source: Hello, April 1992.



I would like to elaborate on the strategies adopted by Singapore Telecom in detail although the details in each strategic thrust are not necessarily exhaustive.

## **STRUCTURE**

To imprint the vision of the company on all its staff, the organization and managerial infrastructure is very important and thus one of the first steps undertaken by Singapore Telecom management in positioning itself for the future success was an organizational restructuring. An external consultant, Arthur D. Little, was commissioned to conduct a review of the organization in 1988. Demands for information and communication systems had also grown tremendously. The reorganization review would make Singapore Telecom an advanced, dynamic and cost effective organization and thus involved reorganization and enhancement of the management control systems.

### Reorganization

The new organizational structure would have four types of units:

- Strategic Business Units (SBUs) - sell services and products to external customers. They determine their own strategies and objectives and are managed as profit centers. The SBUs are in Postal Services Group and Customer Services Directorate. Their performance is measured in terms of revenue, cost, customer satisfaction and new product development.
- Infrastructure Units - provide infrastructure such as networks, common information systems and buildings. They generally have internal customers and their services are charged to the SBUs through transfer prices. Their performance is measured in terms of level of technical service, recovery of cost, use of technology and utilization of resources.
- Common Support Units - provide SBUs and Infrastructure Units with a range of common support services. These include billing and credit control and the training center and their services are charged to the users. Performance is measured in terms of level of service, cost effectiveness, systems and procedures.
- Policy Units - set corporate policy in a number of key areas such as finance, personnel and regulations. Most policy units report to the President and CEO.

Performance is measured in terms of effectiveness of policy and supporting system cost.

In April 1, 1989, Singapore Telecom underwent the major restructuring following the consultant's recommendations. Union was assured well in advance that there would be no retrenchment as excess staff would be redeployed to areas of growth. Manpower reduction would be achieved through natural attrition, active redeployment and the Special Resignation Scheme. The new structure was designed for Singapore Telecom to<sup>3</sup> :

- be a more customer-driven organization;
- delegate responsibility for greater accountability;
- offer flexibility in operations and improve productivity by offering one-stop shopping;
- integrate functions to create a multi-skilled workforce;
- exploit technological opportunities at a faster pace;
- improve resource utilization; and
- offer a greater variety of services.

Singapore Telecom conducted another major restructuring on April 1, 1994 in a move to streamline operations with greater efficiency. This would prepare the company for competition particularly in the area of mobile communications. In the new structure, the SBUs remain. Their groupings under the three directorates will allow Singapore Telecom to focus on the main areas of growth - domestic operations, international business and overseas ventures<sup>4</sup>. And in October 1995, a new management structure for STI was implemented with the introduction of the Chief Operating Officer post and managing directors made in-charge of business segments instead of geographical areas<sup>5</sup>. (See Singapore Telecom's organizational structure in Exhibit 7-2).

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<sup>3</sup> Source: Hello, Special Edition, January 1989.

<sup>4</sup> Source: Singapore Telecom customers newsletter, Keylines, April 1994.

<sup>5</sup> Source: Hello, November 1995.

Singapore Telecom has also formed new subsidiaries to prepare for the upcoming competition in cellular mobile and paging. Two new subsidiaries, MobileLink and PageLink both became operational in November 1994 and this would provide them with the flexibility and responsiveness required to successfully compete for superior performance<sup>6</sup>. Besides these two subsidiaries, Singapore Telecom has many other subsidiaries to concentrate on different market segments e.g., Singapore Telecom International (STI) for its globalization effort, TEPL for CPE, IIPL for yellow pages, Singapore Post for postal services, etc.

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<sup>6</sup> Source: Hello, November 1994.

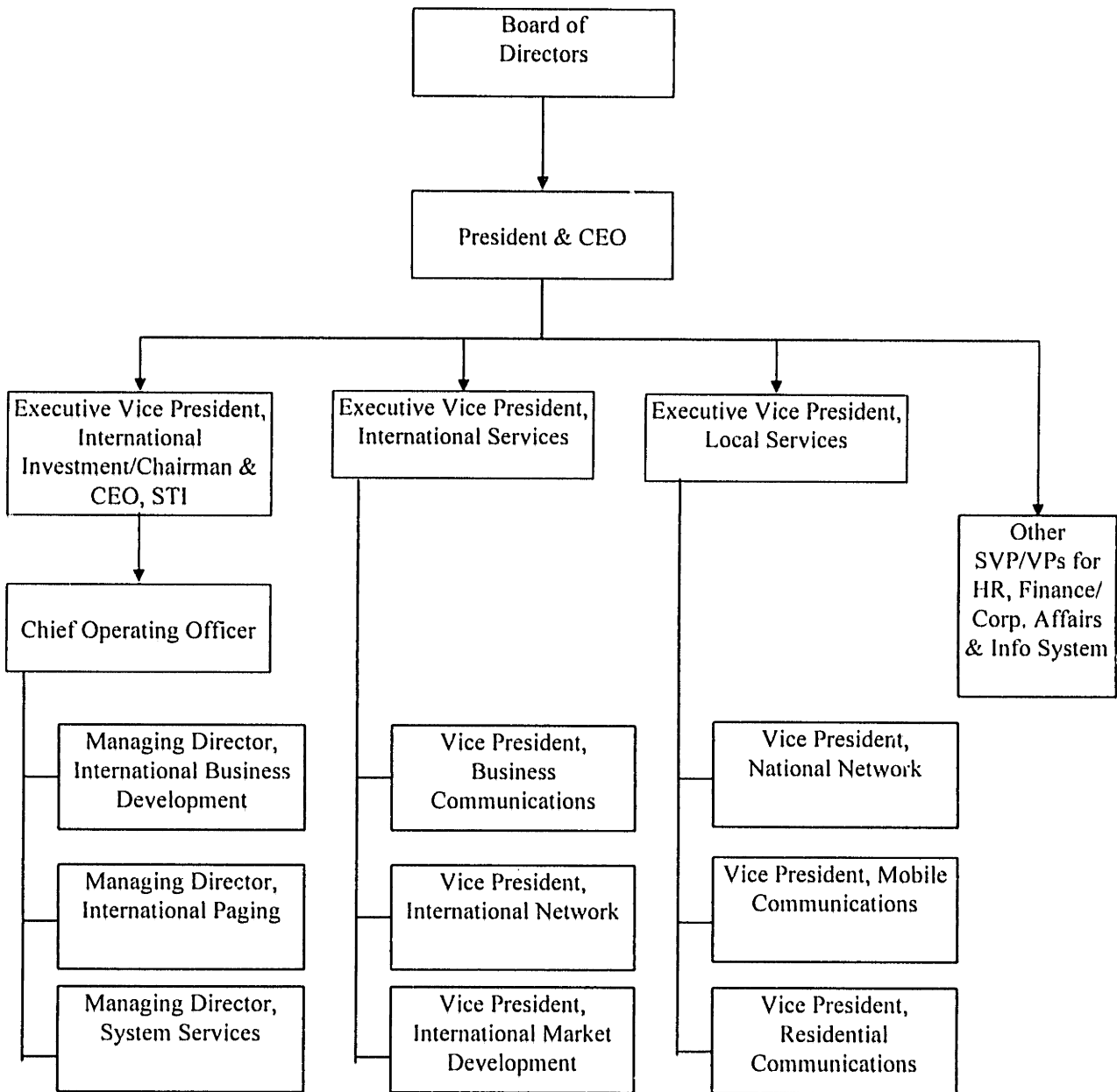


Exhibit 7-2: Singapore Telecom Organization Structure

Management Control Systems

In tandem with the overall organization review, an Information System (IS) Review and Finance Review were implemented. Singapore Telecom intended to make major investment in information systems which included the S\$80 million capital investment for Customer Service and Information System (CSI), Integrated Materials, Purchasing, Accounting and Costing (IMPACT) and Payroll and

Personnel Management System (PPMS). These investments were based on the conclusion of the IS Review conducted by Arthur D Little. An overall IS plan which aimed to support Singapore Telecom's reorganized structure would also benefit customers by providing them with<sup>7</sup> :

- on-line integrated information for all sales and billing inquiries;
- single point of contact for fault reporting;
- faster installation and repair;
- consolidated and customized billing; and
- individualized sales and service for large customers.

The planned reorganization created new roles for Finance. The financial planning and control of Singapore Telecom's resources in a more commercial environment called for strong financial management. In addition, the introduction of SBUs would require enhanced financial information and analysis. The interaction between SBUs also called for greater financial support in costing, financial and economic analysis. The Financial Review, conducted by external consultant, Torche Ross, was to ensure that<sup>8</sup>:

- financial and management cost accounting systems and procedures are adequate and provide effective control over Singapore Telecom's operation;
- adequate financial and cost data are available for management control, management reporting and decision making; and
- an effective financial organizational structure is set up to implement the proposed financial and accounting systems.

## **PROCESSES**

### **Globalization/Strategic Alliance**

Telecommunication is very much a global business today and Singapore Telecom recognizes that its long term growth and key development strategy lie in the international market. A key player in its globalization plan is its subsidiary, STI which was formed in 1988. At the core of STI's globalization strategy are joint

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<sup>7</sup> Source: Hello, February 1989.

<sup>8</sup> Source: Hello, February 1989.

ventures, equity investments and strategic partnerships with established telecommunication companies. Through STI or otherwise, Singapore Telecom has to date established its presence in some 25 countries.

At first Singapore Telecom made only greenfield investments. But with the purchase of Stjarn TV of Sweden in 1994, it had started to invest in existing businesses. Stjarn TV, founded in 1985, is the second largest cable television provider in Greater Stockholm, an area within 30 kilometers of the city center comprising 250,000 homes<sup>9</sup>. Acquiring the cable television company allowed Singapore Telecom to use its network and if successful in the application for a telephone service license, the telephone network could be integrated with the cable television network.

Singapore Telecom's S\$1 billion investment in Belgacom, Belgium state-owned telecommunications operator, is its latest overseas venture in 1995<sup>10</sup>. Holding 27% stake, it is part of a three member consortium which includes Ameritech Corp. (40%) and Tele Danmark (33%). The consortium bid a total of 73.3 billion Belgian francs for 49.9% stake in Belgacom. This deal would serve as a cornerstone of Singapore Telecom's European efforts in that it not only provides access to the Belgian telecommunications market which is still relatively underdeveloped compared with its neighbors, but it also opens the way for Singapore Telecom to gain a share of the lucrative European markets once deregulation takes effect in 1998.

Singapore Telecom would invest initially US\$20 million in a planned US\$500 - 800 million regional satellite based mobile handphone system which is targeted to become operational in 1998<sup>11</sup>. Its partners included a local technology company and four Chinese parties. The parties involved had incorporated a company called Asia Pacific Mobile Telecommunications (APMT) Satellite Pte. Limited in which all the six partners had equal share. APMT will be opened to national service providers

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<sup>9</sup> Source: Singapore Telecom customers newsletter, Keylines, March 1995.

<sup>10</sup> Source: The Straits Times, Singapore, December 22, 1995.

<sup>11</sup> Source: The Straits Times, Singapore, December 29, 1995.

taking equity stakes in the company. These national service providers will be licensed by their country's regulator to provide interconnection between APMT and the local telephone network. To date APMT has signed memoranda of understanding for national service provider status with Mitsubishi Corp. of Japan and a Thai consortium. It is currently holding talks with four other countries on possible national service provider agreements. The service area of the APMT network will cover India, China, Japan, Indochina and all of the South East Asian countries. The system will be competing with other global or regional mobile satellite network e.g., Iridium, Globalstar and Inmarsat-P. (Singapore Telecom would likely be service providers for the Iridium and Globalstar systems).

In March 1995, Singapore Telecom invested US\$94 million for a 6.7% equity stake in a new UK company called I-CO Global Communications Limited that would provide global mobile satellite services called Inmarsat-P<sup>12</sup>. I-CO is expected to offer a seamless global mobile service in 1999 and will be fully operational by 2000. The service includes voice, facsimile, data and paging. These will be provided via a network of 12 satellites orbiting about 10,000 km above the earth. The satellite system is designed to be fully integrated with existing and future cellular systems. The handphone has a dual mode operation: it operates as a cellular phone where cellular service is available and switches to satellite mode when it is not. The project was initiated by Inmarsat and I-CO was formed with the signing of the agreement between Inmarsat and 38 investors who were members of Inmarsat.

Singapore Telecom, AT&T and KDD had joined forces to form World Partners, an association that would offer multinational corporations a new level of customized business communication services. World Partner will provide a family of data and voice services under the name WorldSource. WorldSource services will have common features and standards of performance around the world. The services include virtual private networks for voice communications, private line services for data and voice, and frame-relay services for high speed data transmission.

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<sup>12</sup> Source: Keylines, March 1995.

Besides the above activities, setting up overseas offices could also help Singapore Telecom strengthen its foothold in the overseas market. Providing seamless services is the main reason for setting up overseas offices. Singapore Telecom had opened offices in the US, UK, China and Japan. These offices work closely with their international customers giving them end-to-end attention with the possibility of hubbing in Singapore. These offices show Singapore Telecom's commitment to provide the highest possible level of services in meeting its customers' telecommunication needs.

### **Infrastructure Modernization/Development**

#### **Domestic Network**

Singapore Telecom has invested large sum of money to upgrade or enhance its domestic telecommunication infrastructure. Careful and well-timed investment in technology is the key to success for Singapore Telecom. In 1993, investment was made to introduce a new transmission technology known as Synchronous Digital Hierarchy (SDH). As opposed to the conventional Plesiochronous Digital Hierarchy technology, SDH will facilitate remote management and control of all transmission equipment by the network management system. The remote management includes fault diagnosis, services provision and routing and continuous performance monitoring of working links. The SDH technology enables more flexibility and transmits at higher speed than that of the existing technology.

Singapore Telecom put much emphasis on total digitalization of its network. In 1983, the first digital switch was installed and the entire program for all the 28 exchanges took ten years to complete and cost more than S\$500 million<sup>13</sup>. With complete digitalization of its network on September 1, 1994, Singapore Telecom was able to offer nationwide, advanced new services e.g., Phone Lock, Call Transfer, Auto redial, Do-Not-Disturb, Call Waiting, Call Back, Three-way Calling, Fone Mail, etc. Digitalization also enables Singapore Telecom to keep its operational expenses low and it is a more labor-saving technology.

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<sup>13</sup> Source: Keylines, October 1994.



Singapore Telecom launched its Intelligent Network (IN) on December 1, 1992 at an investment cost of S\$6 million<sup>14</sup>. It was the first IN to be installed in Asia. IN is essentially a telephone network with added computer intelligence allowing it to support value-added services such as local toll free numbers and call routing based on calling areas, priority routing and call distribution pattern.

#### International Network

In 1995, Singapore Telecom awarded a S\$24 million contract to Alcatel Bell of Belgium for the installation of two gateway trunk digital switching units<sup>15</sup>. The equipment not only replaced the existing units which offered Subscriber Trunk Dialing but it also expanded the scope of service to include International Direct Dialing (IDD) and international IN calls.

In November 1991, Singapore Telecom commissioned a third digital international gateway AT&T 5ESS switch at a cost of S\$40 million to establish overseas telephone connections. The third gateway switch supplemented the existing two gateway switches and provided an additional 5000 circuits<sup>16</sup>.

Global Advanced Telecommunication Services System (GATES), an international IN system that provides more value added international services, was commissioned in May 1994<sup>17</sup>. Purchased from Alcatel Bell, GATES stores customers' information and routes calls according to customer's requirements as well as deploying new service provisions. Many features are possible e.g., credit limit setting, day and time manager routing, call distribution and call forwarding.

More than half of Singapore Telecom's revenue comes from international services. International infrastructure is the resource on which Singapore Telecom's business would grow. Singapore Telecom had made substantial capital investments in improving and upgrading its submarine cables and satellite earth stations, which are its two main international transmission systems. The new Seletar Earth

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<sup>14</sup> Source: Hello, December 1992.

<sup>15</sup> Source: Keylines, May 1995.

<sup>16</sup> Source: Keylines, December 1991.

<sup>17</sup> Source: Keylines, May 1995.

Station was commissioned in August 1995 at a cost of some S\$84 million<sup>18</sup>. Together with the existing two earth stations, Singapore Telecom had direct access to a total of eleven satellites with footprints covering more than two-thirds of the earth.

In January 1995, sixteen international telecommunication operators from South East Asia, the Middle East and Western Europe signed a Memorandum of Understanding to plan a new undersea digital superhighway called SEA-ME-WE 3<sup>19</sup>. It will use optical fiber technology and operate at transmission rate 16 times faster than that of SEA-ME-WE 2. This will cater to the increasing demand for broadband services such as Asynchronous Transfer Mode (ATM) and high definition television (HDTV). This followed closely the inauguration of SEA-ME-WE 2 in October 1994 in which Singapore Telecom had a 13.5% stake in the US\$700 million project<sup>20</sup>. The SEA-ME-WE 2 submarine cable can handle 60,000 simultaneous telephone calls and stretches from France to Singapore, linking a few strategic places along its way.

### **Cost Reduction/Rationalization/Productivity Improvement**

#### **Transfer Pricing**

At about the time of the Arthur D. Little organization review, management decided that the hidden costs of all aspects of Singapore Telecom's operations would have to be accounted for. The aim was to identify and determine all inter- or intra-departmental cost elements so that an internal market would be set up in which departments would have to pay when they were to incur a particular cost element. The rationale of management's decision was explained to the staff.

Previously, not being conscious of costs led to various wastage. It was interesting to observe that people would react differently once they became more conscious of the cost. The manager of each department instinctively asked himself or herself this question: whether incurring a particular cost was mandatory or

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<sup>18</sup> Source: Keylines, September 1995.

<sup>19</sup> Source: Hello, January 1995.

<sup>20</sup> Source: Keylines, November 1994.

discretionary in the course of carrying out his or her area of responsibility. More often than not, it would dawn on them that their departments had been paying unnecessary expenses. And naturally they would react by cutting down such wastage.

The effect of the whole policy was that there was a change in the corporate culture. When staff became more cost-conscious, it naturally led to other related issues like productivity, value for money, goldplating of products and services, top quality management, etc. The immediate effect on Singapore Telecom as a whole could be seen in many areas like:

- Occupancy cost;
- Internal training;
- In-house telecommunication services; and
- Hidden unemployment.

#### Productivity/Total Service Quality

Investment was made in customer service improvement. The S\$60 million CSI supplied by BT was developed to enhance and customize functions supporting over 50 services provided by Singapore Telecom and commissioned in October 1992. As an integrated database, by making a wide range of customer and service information readily accessible to the customer service representatives and operational staff, the CSI system makes possible faster, more efficient response to customers' needs as well as supporting one-stop shopping<sup>21</sup>.

Singapore Telecom put much emphasis on total quality management (TQM) which aims to improve quality and productivity while keeping costs down. Its TQM steering committee is chaired by the President & CEO BG Lee Hsien Yang. The steering committee consists of top management and representatives from the company and union. Union representation is important as the union can help explain and communicate policies made by the steering committee. TQM committees led by a vice president are formed to promote and monitor the Staff

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<sup>21</sup> Source: Keylines, November 1992.

Suggestion Scheme and Quality Control Circles as well as identify and coordinate inter-group and intra-group TQM projects.

A new receipting system for faster processing of payments of bills was installed in May 1993. The system greatly enhanced productivity and efficiency because it processed payments faster. The system had seventeen receipting workstations equipped with printers and bar-code scanners. With the use of bar-code scanners to receipt payments, the staff no longer needed to manually key in subscribers' account number and the amount paid. Human errors were thus minimized.

#### Retraining

In April 1989, additional functions were integrated into exchange operations to streamline operations. Cross training to acquire new skills and knowledge was provided to help staff to adapt. Also, about 140 technicians were redeployed to new areas of work. They had to learn new skills and adjust to the new work environment.

#### Cordial Labor Management Relations

In order to compete successfully, the support of the workers is paramount. Singapore Telecom's management has enjoyed cordial relationship with the union. Management is committed to developing, amongst management especially, a greater appreciation of the role and importance of industrial relations. The relationship with the union is based on long term mutual benefits built on mutual trust and joint consultation. An environment in which employees are well informed, motivated and empowered to perform their best as well as equitably rewarded is nurtured consciously.

#### **Continual Service Enhancement/New Service Provision**

##### International Services

Singapore Telecom is facing stiff competition in the area of international leased circuits and data services. Large multinational companies, when deciding where to hub their networks, take into account the quality of service, price and the carrier's ability to offer supporting services.

Singapore Telecom had received feedback that the International Calling Card (ICC) was not user friendly as there were too many digits to remember - 26 digits altogether for account number, PIN, country code and telephone number. In response, the ICCs now have personalized account numbers that match customers' own telephone number or NRIC number (equivalent to social security number). The PIN is also user programmable.

Since June 1993, frequent travelers can enjoy considerable savings on overseas phone calls using the ICC. The ICC lets you call Singapore toll free thus avoiding expensive hotel surcharges. With the ICC, customers can call Singapore using the Home EasyDial or Singapore Direct services. ICC holders can also make calls to 184 IDD destinations from Singapore using the Overseas EasyDial Service. The ICC comes in two forms - Gold and Silver. The Gold ICC offers the additional service of Global EasyDial where call can be made from over 38 countries to any destinations in the world<sup>22</sup>.

Call center service is being provided to help boost business of the customers. A call center refers to the service where a subscriber's customers can call from anywhere in the world without having to pay for the call. Companies have found that toll-free numbers boost business and call centers are popular with airline and hotel reservations, sales inquiries, order taking and help hotlines. Competition has intensified and companies now attempt to capture market share by streamlining their operations and using information technology to improve their efficiency and customer services. For example, Hilton Reservations Worldwide call center in Singapore handles calls from Singapore, Hong Kong, Indonesia, Malaysia, Thailand, the Philippines, South Korea and Taiwan. A customer in Hong Kong wanting to make reservation in Taiwan calls a toll-free number. Unknown to him, his call is routed to the Singapore call center. The staff is able to tell from the system that the call comes from Hong Kong and they can answer the call in Cantonese, thus adding a personal touch to the service. The call center observes all

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<sup>22</sup> Source: Hello, June 1993.

the holidays of the countries which it serves. If there is a public holiday in Singapore but not in Hong Kong, the center will open to serve Hong Kong customers during office hours. After office hours, the calls could be re-routed to other call centers either in Texas or London depending on the time. Such aggregation of calls to a single center improves the productivity and reduces the operational cost of the reservation operation.

With moves to promote Singapore as a broadcasting hub in Asia, Singapore Telecom launched SkyVision Uplink and Downlink Services in 1992. With the service, broadcasters such as HBO, MTV and the Discovery Channel can beam their programs to viewers across Asia by satellites. Multinational corporations in Singapore can also set up cost effective communications to their remote overseas offices using Globespan VSAT Space Link Service from Singapore Telecom introduced in mid June 1995<sup>23</sup>.

#### Wireless Services

MobileLink has an ongoing program to improve handphone reception inside buildings with high traffic patterns and in areas where there is a strong need for good reception. When the cellular phone service was introduced, it was intended for outdoor use. Nowadays, mobile users are increasingly using the service indoors. As the Singapore skyline changes, new buildings block off transmission and MobileLink has to make adjustments and fine-tunes its systems to take care of the problems. In the area of customer service, MobileLink is beefing up customer care and increasing the number of customer service lines and liaison positions.

To improve service to both users and vendors, MobileLink introduced an electronic system where vendors no longer need to fax a customer's application to MobileLink for activation of service, thereby offering service with minimal delay. Other service enhancements include the introduction of two-way short message service (SMS) for GSM subscribers. With SMS, a customer can use his/her

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<sup>23</sup> Source: Keylines, June 1995.

handphone to send a short message. When the called party also has a GSM phone, he/she can send a reply without the need to speak a word.

MobileLink has awarded a contract of over S\$70 million to Northern Telecom for a new Personal Communications Network (PCN) based on the European DCS1800 cellular standard<sup>24</sup>. When commissioned in December 1995, more advanced service features e.g., mobile facsimile and dual numbers on the same handphone could be made available. In the pipeline are data and fax services for mobile phone customers.

The S\$70 million PCN system was commissioned closely after the installation of the GSM system at a cost of S\$94 million in March 1994. GSM AutoRoam was introduced in October 1994 to Australia, Denmark, Hong Kong, Switzerland and the UK. The service has been extended to Norway, Finland, France, Germany, Indonesia, Malaysia, Philippines, Luxembourg, Turkey, Greece, South Africa, Belgium, Italy, Macau, Netherlands, Portugal and Taiwan<sup>25</sup>. With GSM AutoRoam, the user can use the Singapore mobile phone, number and SIM card when in these countries. MobileLink's GSM system will keep track of the user's location and will automatically re-route all calls to the user.

In July 1994, DataRoam was offered which is Singapore's first public mobile data network<sup>26</sup>. The DataRoam network boasts safety mechanism such as error detection and correction to ensure a high level of reliability. Coverage is nearly country wide but with the store and forward feature, customers can still receive undelivered incoming message once they move into a covered area. The system is based on Motorola's DataTac technology and operates at 19.2 kbit/s. With DataRoam, users can send information to each other and retrieve data from a computer without having to be hooked to a telephone line via portable notebook computers or palmtops.

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<sup>24</sup> Source: Hello, February 1995.

<sup>25</sup> Source: GSM AutoRoam service pamphlets, 1995.

<sup>26</sup> Source: Keylines, August/September 1994.

Business travelers can send inflight facsimile messages to any destination worldwide with the introduction of the global airborne facsimile service in June 1993. The service provided by Skyphone consortium comprising Singapore Telecom, BT and Norwegian Telecom , complements Skyphone telephone service, introduced in May 1991<sup>27</sup>.

### Information Services

In July 1994, Singapore Telecom offered its Internet service called SingNet. The SingNet system was set up at a cost of S\$1.2 million. As part of its commitment to enhance and support regional Internet activity, it had linked up with other systems in Brunei, Pakistan, Sri Lanka, Bangladesh, Indonesia, Nepal, the Philippines and most recently InternetKDD. With such a link up, users could access and download files quickly without having data routed to US first. In the first quarter of 1996, SingNet would offer access to Microsoft Network<sup>28</sup>.

In May 1993, Singapore Telecom started a service that enabled information providers to offer customers easy and instant access to pay-per-call information services<sup>29</sup>. Called AudioLine, this is another value-added service made possible by the IN commissioned in December 1992. AudioLine connects callers to Information Providers who provide information such as health tips, financial data, sports news and even the horoscope. To access the service, the user has to dial a 1-900 number.

A new multi-machine Televue system was commissioned in June 1994 to offer a faster and expanded videotex service that can handle more users<sup>30</sup>. It used to take about eight minutes to see a page of color photographs on Televue. With the new system the same photograph can be seen within 2 minutes. It also means that for high speed reception, Televue users no longer need to receive information off-air as in the past. The new system can accommodate 100,000 users. The system can be easily expanded by adding more minicomputers. The system also allows 1,200 subscribers to log on at the same time which is four times of the previous capacity.

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<sup>27</sup> Source: Keylines, June 1993.

<sup>28</sup> Source: The Straits Times, Singapore, December 8, 1995.

<sup>29</sup> Source: Keylines, May 1993.

<sup>30</sup> Source: Keylines, June 1994,



There is a wide selection of services on Teleview ranging from banking and finance, education to teleshopping and travel. New services already introduced include the National Library Online Public access catalog and Internet access. Singapore Telecom had spent S\$15 million on the new system. An additional S\$35 million would be spent to enhance and upgrade the system till 1996. Teleview was launched as a field trial in September 1988 and commercially launched in October 1990.

### Landline Services

In December 1989, Singapore became the first country in the world to have ISDN available commercially on a nationwide basis. (ISDN service was first introduced in December 1988). International ISDN links with Japan, US and UK were launched. Customers can use the ISDN-30 service which offers thirty 64kbit/s channels on a single line for more capacity since May 1994<sup>31</sup>.

Introduced in December 1992 was a Centrex service known as PhoneNet which was capable of providing PABX type facilities for organizations via the public telephone system. With PhoneNet, the user can enjoy all the facilities of an office system or PABX without having to actually purchase one. The Civil Service has contracted with Singapore Telecom for such a service to link 49 government ministries and departments at a contract price of S\$5.7 million. The Civil Service expected to save manpower and administrative cost with the service<sup>32</sup>.

### Rate Rationalizations

For a fairer tariff system and also to position itself for competition where cross subsidy is frowned upon, Singapore Telecom converted the flat tariff system for domestic telephone to time based charging in December 1, 1991<sup>33</sup>. It is fairer because for low volume users, there will be savings in their bills. Those who use more will have to pay more thus removing the cross subsidy amongst the users.

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<sup>31</sup> Source: Hello, July 1994.

<sup>32</sup> Source: Keylines, November 1993.

<sup>33</sup> Source: Singapore Telecom Annual Report, 1991/92.

In 1994, Singapore Telecom slashed tariff three times and customers were expected to save S\$64 million annually<sup>34</sup>. It introduced an off-peak rate for mobile phone services in January 1993 providing savings of S\$14.5 million annually<sup>35</sup>. In 1991, reduction in rates for IDD and telex passed back an annual saving of S\$10 million to its customers<sup>36</sup>. In April 1992, the rate revision for international leased circuits saved customers S\$16.6 million annually<sup>37</sup>. In July 1989, there was a tariff reduction round (the eleventh since 1979) where customers saved S\$11 million a year<sup>38</sup>. Tariff reductions were also effected for Inmarsat services and the ICC.

## **Research and Development**

### Broadband Integrated Services Digital Network (BISDN)

BISDN offers high speed digital communication switched paths capable of supporting high transmission speed. As such it is capable of supporting television program distribution, interconnection of high speed workstations and local area networks. BISDN technology is currently in the development stage and leading telecommunication suppliers in Japan, Europe and US have begun work on prototype BISDN systems. Singapore Telecom had implemented a BISDN field trial in December 1992<sup>39</sup>. Terminal equipment such as videophones, television monitors, high speed workstations and LAN servers were connected to the BISDN system via optical fiber cables. The trial explored the feasibility of broadband applications such as distributed video retrieval, remote access on document and medical information like X-ray images. The trial was targeted for a two-year duration and commercial BISDN service is expected to be in 1996/97.

### Video On Demand Field (VOD) Trial<sup>40</sup>

Singapore Telecom's VOD trial, to start in the first quarter of 1996, will be offered free of charge to subscribers for the first 3 months, after which a three-tier

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<sup>34</sup> Source: Keylines, December 1994.

<sup>35</sup> Source: Singapore Telecom Annual Report, 1992/93.

<sup>36</sup> Source: Singapore Telecom Annual Report, 1991/92.

<sup>37</sup> Source: Singapore Telecom Annual Report, 1992/93.

<sup>38</sup> Source: Keylines, June 1989.

<sup>39</sup> Source: Keylines, February 1993.

<sup>40</sup> Source: The Straits Times, November 14, 1995.

pricing scheme is likely to be implemented. The first tier is a fixed monthly fee with unlimited access to movies; the second will be on a pay-per-view basis; and the third will be a combination of both. Three hundred households involved in the market trial will be divided into three groups with each testing a single scheme. However, the exact commencement date is not finalized due to software and technical issues yet to be solved in such technologically complex system. It expects more technical problems would be ironed out once the three-month technical trial begins.

Singapore Telecom is currently the only VOD trial licensee in Singapore. If it decides to offer VOD commercially, it will have to apply to the Singapore Broadcasting Authority for a commercial license. VOD which is interactive and multimedia would use the ATM technology. It would be a competitor to cable television services currently offered by Singapore CableVision. Singapore Telecom is optimistic that the VOD service would be profitable. However, as the VOD is in the forefront of technology, in order to ensure success, Singapore Telecom would refrain from being in the forefront. Instead, it would adopt a strategy of critical analysis of its field trial results, careful planning and forming the right strategic alliances.

The services fall into 4 categories: Infotainment, education, customized news and transactional services. VOD, unlike cable television, is available anytime and does not need for scheduled screening time. During the trial, each household will have a remote controller and a set-top box that is the interface between the user and the VOD system. It has a PIN protection feature and user friendly control functions and voice prompt. Singapore Telecom will invest S\$20 million in this VOD trial for which a 4 member consortium i.e., Mitsui, Fujitsu, Hewlett Parkard and Philips, will provide the equipment.

## **PERFORMANCE**

### **Benchmarking**

Singapore Telecom does have a system of benchmarking its performance against other telecommunications operators, especially Hong Kong Telecom, BT, NTT and AT&T. Benchmarking measures include the following:

### Financial Indicators:

- Earnings per share;
- Net tangible assets per share;
- Gross dividends per share;
- Returns on Equity (ROE);
- Returns on Assets (ROA);
- Operating returns on turnover;
- Operating returns per employee;
- Turnover per employee, etc.

### Service Indicators:

- Penetration rates of cellular mobile, paging etc.;
- International outgoing versus incoming traffic;
- Working direct exchange lines per employee;
- Network faults per month;
- Service restoration time, etc.

In addition, Singapore Telecom regularly commissions customers surveys which are conducted by external organizations to benchmark its customer service quality.

### **Empowerment/Incentive**

In 1989, Singapore Telecom had embarked on a job evaluation exercise for senior officers. With a job evaluation system, the placement of manpower, training and development of staff could be focused according to the needs of the organization. Job evaluation involved the systematic process of determining the size and value of a job by analyzing the job content, the relative difficulty of a job content and its importance to the organization. The system adopted was the Hay Job Evaluation System extensively used in many organizations. The exercise also provided a rational measure in assessing the relative value of jobs within the organization and to determine the salary competitiveness in the market. Around this time, the incentive system was changed towards a performance based system so that good performers would be rewarded more than others.

Aside from performance based reward system, Singapore Telecom provides many fringe benefits like health and dental benefits, holiday accommodation and subsidized telephone bills. Singapore Telecom also provides scholarship to employees for tertiary education or post graduate studies as well as scholarships to their dependents.

To monitor the general morale of the staff, it carries out staff surveys yearly to gauge the staff's job satisfaction and feeling of empowerment and belonging in the company.

## **CULTURE**

Singapore Telecom's motto is "Service first. Always". Owing to the historical baggage, Management has done its utmost to inculcate the spirit of customer responsiveness, sense of urgency, and cost and productivity consciousness. One could sense that the culture is steadily being diffused from top management down to the lower hierarchy.

The innovations in services, new ways of doing things and the aggressive globalization drive in recent years have definitely impacted on the corporate culture.

## **SUMMARY**

In this Chapter, the strategic thrusts adopted by Singapore Telecom were reviewed using Hax's framework on strategic management. One could find similarity of the activities undertaken to those of the other dominant carriers profiled in Chapters 2 to 4. In a sense, Singapore Telecom is fortunate in that its journey into the future telecommunication environment is not alone but that it could always reflect on the experiences of the other dominant carriers in the developed countries and emulate their strong points and avoid their mistakes.

Overall, I would say that Singapore Telecom has positioned itself well for future competition. Sure, there are areas for improvements which I will defer till the next Chapter.

## **8. IMPROVEMENT/NEW STRATEGIES RECOMMENDATIONS**

### **INTRODUCTION**

In this Chapter, I would like to look into any improvement on Singapore Telecom's existing strategy or new strategies which it should adopt to better face future competition.

Owing to the excellent management by top management, I am hard put to think of any. However, there will definitely be a few aspects which could be improved upon or not implemented yet. Using the Hax framework on Positioning, Sustainability, Valuation and Flexibility of Strategy, I will identify areas for improvement and will present my recommendations based on the critical success factors identified in Chapter 6.

### **POSITIONING**

From Chapter 7, one could see that the strategies undertaken by Singapore Telecom to position itself for future sustainable growth have been quite comprehensive. The strategies have elements which could be found in the strategies of dominant carriers in other countries, e.g., globalization, forming of alliances, cost reduction, service development, etc. It also avoids as far as possible the pitfalls faced by other dominant carriers.

#### **Management Vision/Strategy**

Presently, the yearly business mission and objectives are formulated in a way that can be greatly improved upon. It has a strategic planning process called Hoshin but the vision of top management is not relayed to all employees effectively. Although the discussion outcomes of the yearly top management workshop were briefed to senior officers, there is not much follow up actions. A reason for this is the lack of a useful systematic approach to strategic planning that will not lose its steam. It does not mean that presently the targets set annually by Singapore Telecom could not be met but a systematic approach would have the advantage of motivating staff as they could clearly see their roles to the accomplishment of the company's objectives.

I would like to recommend that a systematic approach to corporate, SBU and functional strategic planning be adopted in line with the method proposed by Arnaldo Hax and Nicolas Majluf. They have identified a ten-task corporate strategic approach as follow<sup>1</sup>:

- Scan environment at the corporate level to understand the external forces impacting the firm;
- State the mission of the firm by choosing the competitive domains and the way to compete;
- Segment the business in terms of market and geographical scope for focus;
- Implement horizontal strategy for synergistic linkages across business units;
- Define the boundaries of the firm's activities (vertical integration);
- Seek corporate philosophy which defines the relationship between the firm and the stakeholders;
- Determine the strategic posture of the firm in terms of strategic thrusts and corporate performance objectives;
- Assign priorities for resource allocation and identify opportunities for diversification and divestment;
- Design and adjust the organizational structure, processes and systems to be congruent with the corporate culture; and
- Select, develop, appraise, reward and promote key personnel.

For the task on formulating the corporate strategic thrusts and performance objectives, the SBUs and functions would play their required role in coming out with their business and functional strategies respectively. This could be coordinated with a strategic planning committee with broad corporate representation. The formal strategic planning process is shown in Exhibit 8-1 (which has been called affectionately as the Snake by Prof. Arnaldo Hax).

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<sup>1</sup> For details, see "Corporate Strategic Tasks" by Arnaldo Hax and Nicolas Majluf in European Management Journal Vol. 12 No 4, December 1994.

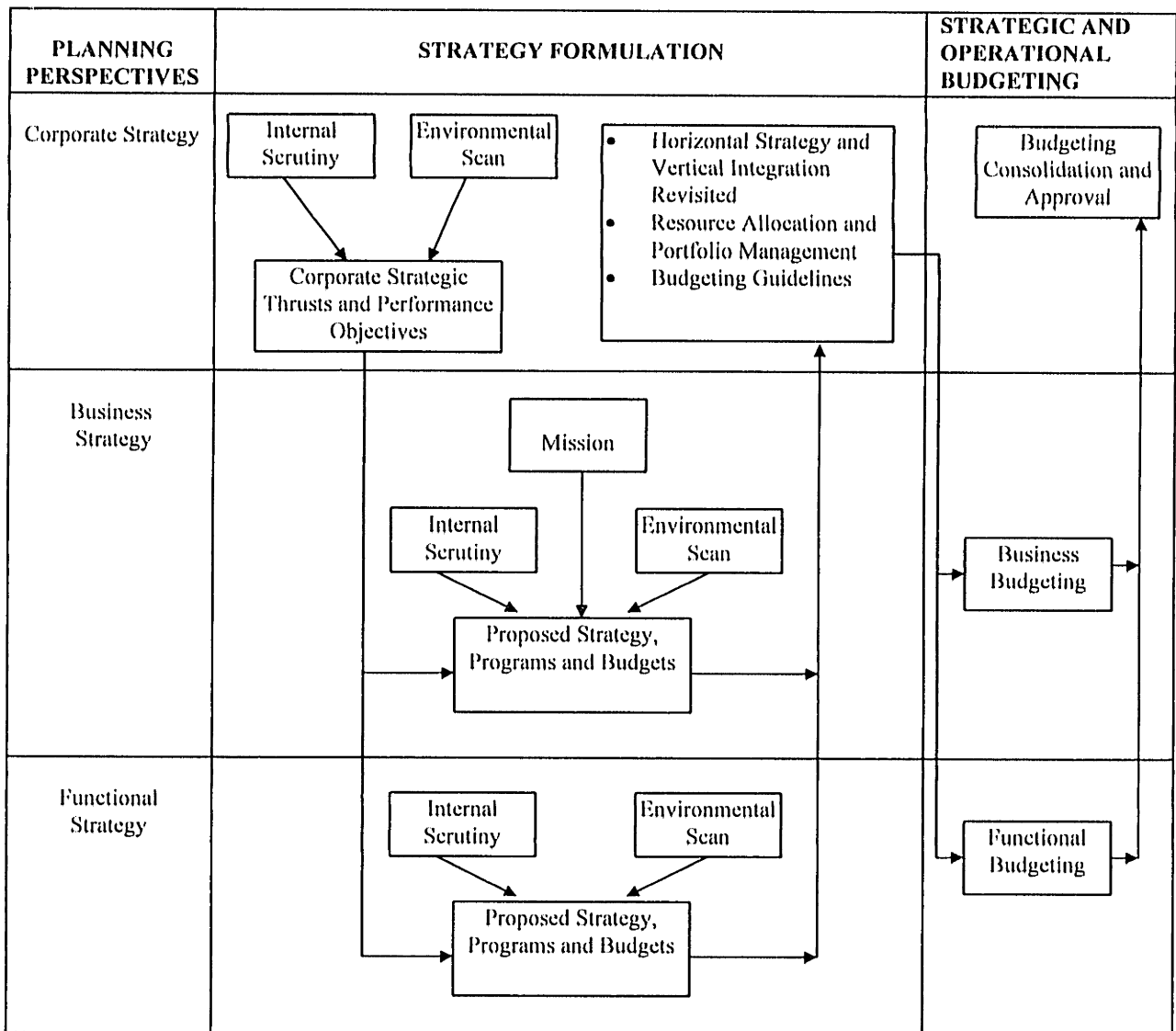


Exhibit 8-1: Formal Strategic Planning Process.

### Management Control System

The main objective of management control is for strategic accountability in order to achieve superior financial performance. Presently, the link between the measurements and the critical success factors are not obvious or lacking. Admittedly, some indicators on the performance of most of the critical success factors are available but the indicators do not apply to all such factors nor are they implemented corporate-wide.



Singapore Telecom has implemented a set of useful financial performance and productivity measurements but this set can be expanded and enhanced. Some measures on how well Singapore Telecom performs in the corporate culture, technology and service areas can be looked into.

Lastly, the linkage between management control and the reward system can be enhanced further by incorporating a feedback loop to ensure strategic accountability.

### **Communication and Information System**

Singapore Telecom has a corporate LAN system as well as an internal staff newsletter and customer newsletter. Dissemination of information is quite efficient. However, the dissemination of top management's strategic vision and thinking is not that widespread as already mentioned. Besides not having an effective strategic planning process, this may be due to the need for confidentiality.

It is recommended that top and middle management put in more effort to disseminating the company's vision by having more regular interactions with staff.

### **Corporate Culture**

Presently, Singapore Telecom does not have a credo or corporate culture manifesto which is publicly displayed for every staff to refer to. The simple motto of "Service first. Always", though a good one, is not detailed enough to let the staff know what is entailed in achieving this. It would be in the right direction to formulate one which will guide the company through difficult years in the future.

A new culture has to be imbued in the employees to accept wholeheartedly cross functional and matrix reporting. Singapore Telecom cannot afford not to have this if it wants to fully utilize its strength as a corporate group. Presently, such a structure has not been formally instituted and so the fullest potential might not be reaped, though cross functional working has been carried out. For example, STI must not only continue to be able to draw expertise from MobileLink and PageLink for its overseas operation, it should also have the formal authority to assess staff not directly reporting to it. STI could only develop its own engineering expertise and capability to a certain extent as it is costly as well as not the best approach to do so

to the fullest extent. Besides, Singapore Telecom's staff would not have the opportunity for overseas exposure which is beneficial to their own career advancement as well as giving them an international perspective.

## **Finance**

### Risk Management

Singapore Telecom is blessed in that its financial strength is solid. Debt over equity ratio is less than 10%. It also has a treasury department to take care of its investments and risk management of exposures to foreign currency fluctuation. I am unable to recommend improvements in this area.

### Capital Management

One aspect of capital management is to determine how well shareholders' value has been enhanced. As mentioned, Singapore Telecom has a set of financial measurement indicators for benchmarking. Further inclusion of other useful indicators like cost of capital, economic value add, market value add and market to book ratio can be considered.

In the long run, with increasing investment in infrastructure and the pace of globalization, capital budgeting will become more and more important. The budget process especially on resource allocation has to be improved upon in order to reduce the time taken to formulate such resource allocation.

## **Technology**

### Selection/Timing

Singapore Telecom does not have its own R&D facilities to research or develop new technologies. It is used to acquiring technologies from the suppliers. Hence there should not be any need to strive to be at the forefront of technology. Its competitive strength is not on technical research and development but rests on system and operational management and planning. Thus Singapore Telecom should be careful in implementing new technology where the customers' needs are not obvious. Field trials on VOD and BISDN should not be treated as management's commitment to invest money for commercial implementation. (Singapore Telecom could be under pressure as Hong Kong Telecom had completed its VOD market trial

in September 1995 and had announced that commercial service would start in 1996). In my opinion, it is better to see how the market developed in other developed countries before committing large sums of money in new technologies. What is more important for Singapore Telecom is to be innovative and come out with applications based on existing technology which it already possessed e.g., IN, ISDN and Internet. In addition, field trials should put more emphasis on assessing customers' potential interest and needs as well as identifying aspects of the technology for user-friendliness improvement. Singapore Telecom should not fall into the trap of being technology-driven.

For example, in the application of broadband technology, it is cheaper to explore the needs of people for telecommuting, telemedicine, telecontrol, teleshopping, etc. rather than for VOD. Many people are happy with the service of conventional cable television and for that matter, cable television is only going to be introduced in Singapore soon. Thus the VOD field trial in Singapore should be just a trial and nothing else especially when other companies in US are facing difficulties with their trials and having second thoughts on the timing of the VOD introduction. It can wait to see the outcome of Hong Kong's experience in VOD first before making the decision on commercial service offer. Until consumers are ready to embrace the new technology and pay for the initial high service charge that goes with the new technologies or help to reduce the rates through mass market, the massive investments would not make commercial sense.

### **Procurement**

Singapore Telecom has improved much on its procurement process. All along, it acquires its purchases through international Requests for Proposals so I would only recommend that the area for improvement is to speed up the purchasing process through less bureaucracy, concise and precise specifications and requirements.

### **Operations**

Singapore Telecom has been very aggressive in its globalization drive through its subsidiary STI. STI's major weakness is lack of human resources. It has

tried to overcome this by training local people in the technology. Its aim is to have a minimum number of Singaporeans manning overseas operations. Although at the initial stage of the project, more Singaporeans are needed, over time, it is STI's objective to decrease this number and eventually localize the staff. In addition to localization, STI also taps the talent pool in other countries where expertise has been built up over a number of years in STI's joint venture companies.

It is recommended that Singapore Telecom continues to nurture its international investments by putting its best people to run and manage them. The support and control structures relating to these investments should be further strengthened in order to ensure the realization of their profit potential.

Most importantly, its staff should be able to manage the foreign partners in its joint ventures or alliances. They should know what the partners could contribute to the overall success of the venture and ensure in a diplomatic manner that the partners deliver. In addition, they should know what is Singapore Telecom's rights and obligations so that they are not taken advantage of.

In order to have the best people, Singapore Telecom should accelerate the hiring of new blood from outside as well as giving exposure to its managers and staff through internal transfers or posting to its many subsidiaries. At the same time, it should predict the new trend in technology and send its people for training on new managerial skills to meet the need for new leadership talent. This will create a clear career path for promising talented staff within the corporation and will act as a performance motivator. In the training aspect, Singapore Telecom's training center, STA, could play a useful role by providing courses either by itself or in collaboration with other renowned universities to enhance the skills of its managers' core and augmented skills required for managing globalization as shown in Exhibit 8-2.

Although Singapore Telecom is continually monitoring the effectiveness of the organizational structure, it has deemed it necessary to have the Master Planning Division. However, my experience is that the planning function of this Division could be more effectively and productively decentralized to the SBUs. This

is because the SBUs are the depository of the knowledge pertaining to a specific business segment and they should be most conversant in their areas of expertise as well as closer to the end users to plan for the future technology to support the future services wanted by the customers. The Master Planning Division is a relic of the old structure under the monopolistic phase.

Singapore Telecom should continually study the value creation at each business level especially with regard to profitability versus product life cycle. Taken as a whole Singapore Telecom operates over 50 different services and products. Some of these are in the declining phase of their product life cycles. It needs to have creative ideas to persuade stubborn customers to migrate from using the unprofitable services to other more profitable alternate services which meet their communication needs. Examples of such services in their twilight years are telex, telegram and maritime radio communication services. These customers could be given incentives to switch e.g., tariff discounts for a certain period of years and equipment subsidy.

<b>Core Skills</b>	<b>Managerial Implications</b>
Multidimensional perspective	Extensive multiproduct, multi-industry, multifunctional, multicompany, multicountry and multi-environment experience.
Proficiency in line management	Track record in successfully operating a strategic business units and/or a series of major overseas projects.
Prudent decision-making skills	Competence and proven record in making the right strategic decisions.
Resourcefulness	Skillful in getting himself/herself known and accepted in the host country.
Cultural adaptability	Quick and easy adaptability into the foreign culture.
Cultural sensitivity	Effective people skills in dealing with the variety of cultures, races, genders and religion.
Ability as a team leader	Adept in bringing a cultural diverse working group together to accomplish the major mission and objective of the organization.
Physical fitness and mental maturity	Endurance for the rigorous demands of an overseas assignment.
<b>Augmented Skills</b>	<b>Managerial Implications</b>
Computer literacy	Comfortable exchanging information electronically.
Prudent negotiating skills	Proven track record in conducting successful strategic business negotiations in multicultural environment.
Ability as a change agent	Proven track record in successfully initiating and implementing strategic organizational change.
Visionary skills	Quick to recognize and respond to strategic business opportunities and potential political and economic upheavals in host country.
Effective delegatory skills	Proven track record in participative management style and ability to delegate.

Exhibit 8-2: The 21st Century Expatriate Manager Profile<sup>2</sup>.

### **Network Infrastructure and Support System**

Singapore Telecom has one of the world's most advanced network infrastructures and this is due in no small measure to its vision, the international nature of its procurement policy as well as the desire to introduce new and customer-valued services. It has done a superb job in this area and hence I have no recommendations for additional improvement.

An excellent support system will hinge upon the creative exploitation of the information technology. However, it is very expensive to customize software system to the particular needs of Singapore Telecom. It should be flexible and adaptive and Singapore Telecom should try as far as possible to use off-the-shelf systems which

<sup>2</sup> Source: Profile of the 21st Century Expatriate Manager, Cecil G. Howard in Pins and Needles, 29th Issue (January-February 1995), publication of National Productivity Board, Singapore.

still meet the needs of customer support. In the design of the support system, old ways of performing things should be reviewed so that the information technology system would not just simply automate the sub-optimal manual ways of doing things.

### **Marketing and Sales**

Singapore Telecom has learned how to market aggressively its services to the customers today. However, it is still weak in environmental scan analysis and intelligence gathering vis-à-vis its competitors. More training for its marketing and sales staff on these aspects would put Singapore Telecom in a better position to compete effectively.

### **Services**

Singapore Telecom has done a superb job in introducing a varied range of services and in my opinion it has just to keep up to its past record of providing services which can be found available in other countries. (Of course, it has to make a breakthrough in its technology critical success factor to provide a new service which is profitable and being the first in the world.)

A way to improve the speed of new service provision is to monitor the new services offered by other carriers in other countries. This could be done through formal as well as informal means. As Singapore Telecom has a very advanced network infrastructure even compared with the developed countries, whatever services offered by other countries should also be supportable by its own network. For example, its ISDN and IN networks are there waiting for more innovative services to be introduced. Services like telecommuting, telemetering, telemonitoring and telecontrol could be explored.

Generally, Singapore Telecom's staff is responsive to customers' needs after much emphasis placed by management in this area. Singapore Telecom's motto is "Customer first, Always". I would recommend that the service by its staff be assessed continuously and more regularly through customer surveys and mystery customers.

## SUSTAINABILITY

The three requirements for sustainability of the unique competitive advantage of Singapore Telecom are:

- commitment in the investment of sticky factors which are specialized, untraded and durable;
- the sticky factors must continue to be scarce and cannot be imitated so as not to be substituted; and
- appropriability, i.e., Singapore Telecom must appropriate the scarcity value that accrues to the sticky factors. It must not be threatened by hold up by non-owners of the sticky factors and slack by employees.

### Commitment

There is no doubt that management is committed to its strategy. The large investments that management puts into infrastructure modernization and human resource training and education is huge. (See Exhibit 8-3; note that in April 1992, Singapore Telecom was incorporated out of TAS). Each year, management conducts a top management meeting outside Singapore where all the Vice Presidents and above gather together to discuss strategies for the next fiscal year.

Another aspect peculiar to Singapore Telecom that guarantees commitment to success is the fact that it is still majority-owned by the government (88.67% as at June 1995) and the Board of Directors, nominated by the Government, is on its toes to make sure Singapore Telecom is successful. This is because the Singapore Government is very strict and will not tolerate anything less. There is also a political dimension to this as the Government has encouraged the public to buy Singapore Telecom's share in its political drive to give the people a stake in one of the country's jewel corporations.



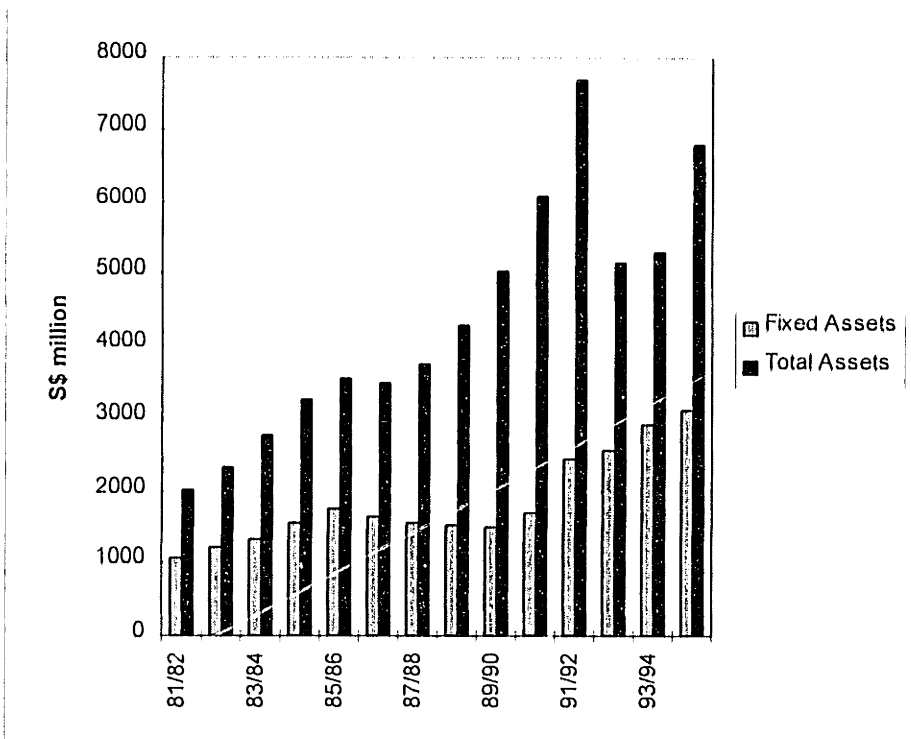


Exhibit 8-3: Fixed Assets and Total Assets of Singapore Telecom.

### Scarcity

Scarcity depends on whether the factors are easily imitable or substitutable. Owing to the historical fact that Singapore Telecom was the only telecommunications service provider, practically all people with experience or expertise in telecommunications reside in the company. This leads to scarcity of experienced personnel to other competitors. In a sense, this is a competitive advantage but many good staff has been target of recruitment from these competitors.

In the domain of infrastructure, Singapore Telecom enjoys the advantage of having a country-wide network which is difficult or time-consuming to imitate. However, due to scarcity of land in Singapore and to reduce national waste, TAS has mandated infrastructure sharing and interconnection and network access.

Singapore Telecom has to be very alert to ensure that the competitors will not appropriate the scarce infrastructural and human resource advantage.

## **Appropriability**

### Hold up by Non-owners

As mentioned, Singapore Telecom is on its guard to prevent appropriation by its competitors on the human and network infrastructure factors. Another dimension for appropriation is non-owners competing against Singapore Telecom in services after Singapore Telecom has launched them and the services prove successful. As the same technology is purchasable by both parties, Singapore Telecom has to win against the competitors by improving and maintaining the service quality standards.

### Slack by Employees

I believe that though human resource management is of a high standard in Singapore Telecom, there is still room for improvement. The performance reward system presently adopted by Singapore Telecom is a source of tension. If managed wrongly, there is the potential risk of employee slack as the reward system could backfire on teamwork and productivity. The salary annual increment as well as the bonus is performance based so as to provide incentives for good performance. The reward budget is somehow linked to the performance of the company so it is a kind of profit sharing. However, the reward budget given each year is fixed and therefore some employees gain at the expense of others. Though in principle, performance based reward system is sound, there are practical constraints which make the system unfair during implementation.

### Appraisal System

Specifically, employees are assessed relative to their colleagues. Problems created by the system are basically due to the forced distribution of ratings (a kind of quota system), relative appraisal and the broad band for the ratings. On the issue of forced distribution, employees perceive that it is unfair to categorize someone in the low band just to meet the quota. Also one may be outstanding but because of the quota system, one is rated a level below one's true performance measure. At the same time, those from small groups are penalized when they are forced to meet the rating distribution targets.

On the relative appraisal issue, as Singapore Telecom is a big organization, it is possible that someone who gets a higher rating could be less of a performer compared with someone from another division/department who gets a lower rating because unfortunately for the latter, his/her fellow colleagues are all relatively better performers than him/her. Another problem associated with relative rating is that it may undermine the spirit of teamwork since you may be helping someone to be better than you in performance! As regards the broad band for the ratings, this means that someone at the high end of the band is not differentiated from someone at the low end of the same band, thereby generating ill-feelings to the former as he/she will feel unappreciated and short-changed.

To effectively motivate employees and enhance performance, I recommend that an open system with dual appraisal ratings be adopted. The key features of the performance appraisal system are as follows:

- absolute rating of performance in five bands based on job requirements for the purpose of determining the annual increment of employees;
- relative rating of performance in five bands viz., top decile, next 20%, next 40%, next 20% and the lowest decile based on performance compared with fellow employees for the purpose of bonus payments; and
- there shall be no targeted distribution for the absolute rating of performance

The logic for having a dual system of absolute and relative rating measures is the desire to maintain a fair system while at the same time awarding superior performers so as to be assured of continued work excellence. An employee will feel fair if he/she is appraised against the job requirements in an absolute scale. This is in line with the spirit that the salary is commensurate with the job requirement and so the performance has to be an absolute one versus the job requirements . However, everyone could understand that no matter how good one is performing, there will be others performing better than oneself. Thus, it is fair to award the better person more compensation in the form of a one-off-payment bonus which is not built into his salary scale. In theory, a person could be graded in the top band absolutely but is at the middle 40% in the relative scale. Also, a person may be in

the top decile in one year and bottom decile the next year! (An example of this may be a Sloan Fellow employee who got top decile rating last year but bottom decile this year since he is not contributing to the company the whole year when he is at MIT Sloan studying).

When employees understand that there is nothing to be shameful about to be rated in the bottom decile so long that they get a good rating in the absolute scale, there will not be any demoralizing effect. Rather, there will exist the motivating effect on the good relative performers. Hence it is very important to have correct descriptive labels for the relative scale. Employees will be confused if the descriptive labels are couched in languages like excellent or poor performance.

The reason for not adopting the targeted distribution for the absolute rating is that it does not stand up to employees' questioning. There is no philosophical underpinnings in terms of human's nature or statistical basis (since the bell curve is true in the theoretical case of an infinite number of employees). Thus management's sincerity will be put in doubt if such a quota system is adopted. It should be noted that the relative rating aspect of the system really implies a targeted distribution, but in this case there is theoretical basis.

#### Reward System

Another aspect that Singapore Telecom could improve upon is the extension of stock option plan to a greater majority of the employees. Presently, the scheme, approved in September 1994, is applicable to the managers and above. It would be a great boost to workers' motivation and productivity if the scheme is extended to more people. In this regard, a systematic and comprehensive reward planning to achieve maximum motivation for superior performance is necessary. Human resource department could consider the determinants of managerial as well as staff compensation following the guidelines as shown in Exhibit 8-4.

	Period of Observation	
	Short Term	Long term
Observed Individual Performance	Salary Increase	Incentive Plan
Observed Group Performance	Bonus	Stock Option

Exhibit 8-4: Determinants of Managerial Compensation<sup>3</sup>.

### Selection/Placement

As human resource is one of the crucial factors for the future success of Singapore Telecom, it has improved its selection and placement process considerably. Competent staff is promoted reasonably fast as compared to the past or assigned to challenging tasks. They are also sent to post-graduate management studies in reputable universities in foreign countries especially in US. It also demands a high qualification entry level into the organization. In addition people from outside Singapore Telecom has been recruited to middle and top managerial posts. Recommendations on this aspect have been discussed above on its globalization drive. Here, I would like to say that the ease of transfer in the case of mismatch in job and aptitude could be made much easier.

Lastly, the uncertainty created by the ever-changing environment should be ameliorated by employee empowerment. Employees should be involved in the decision-making process and involved in delegation. In Singapore Telecom, the decision-making process is relatively centralized, though moving towards more delegation and empowerment gradually.

<sup>3</sup> Source; Chapter 16 of "The Strategy Concept and Process - A Pragmatic Approach" by Arnoldo C. Hax and Nicolas S. Majluf.

## VALUATION

It is without doubt that Singapore Telecom is a well-managed telecommunications carrier. In one of the latest World Telecommunication Development Report findings compiled by the International Telecommunication Union (ITU) of Geneva, it was ranked the 45th largest telecommunications operator in terms of revenue in 1994. With an annual revenue of US\$1.8 billion, it was the fifth largest telecommunications operator in Asia (excluding Japan). ITU's latest Asia Pacific Telecommunication Indicators report also found Singapore Telecom to be the third most productive operator in the Asia Pacific after NTT and Hong Kong Telecom in terms of telephone lines per employee, revenue per employee and revenue per subscriber line. It ranked sixth with 129 lines per employee in the first indicator, third in the second indicator and was top in the last indicator<sup>4</sup>. Singapore Telecom staff is now more committed to productivity than ever before and productivity has been increasing as shown in Exhibit 8-5.

With the introduction of more new services through creativity and the use of advanced digital and fiber optic technology, the revenue per subscriber has also increased over the years. This means that there is value creation and addition to the services required by the subscribers (see Exhibit 8-6).

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<sup>4</sup> Source: The Singapore Straits Times, October 5, 1995.

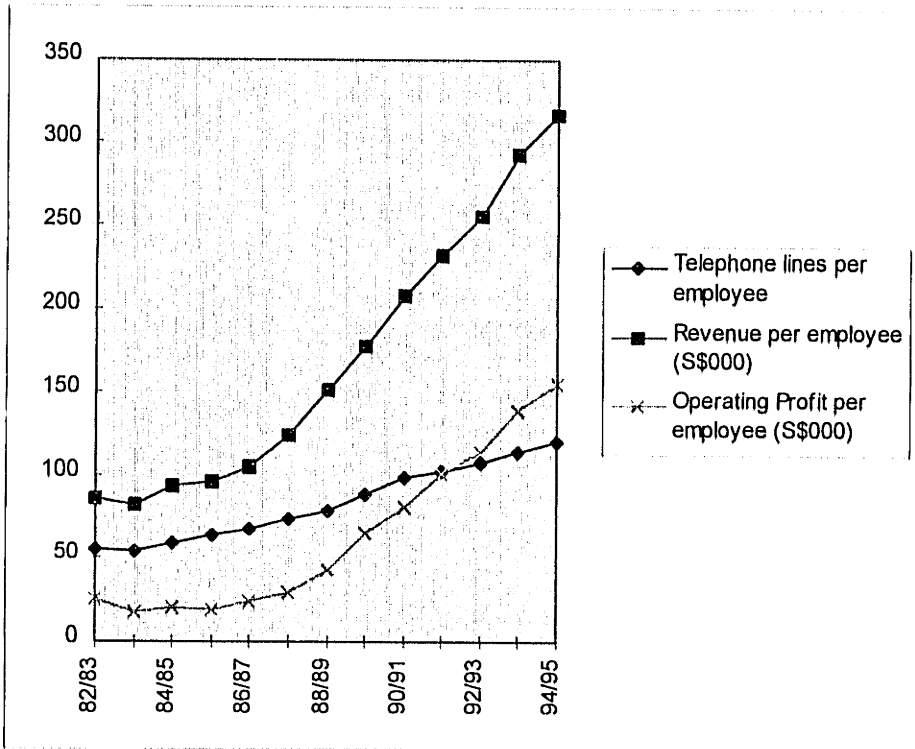


Exhibit 8-5: Productivity Data of Singapore Telecom<sup>5</sup>.

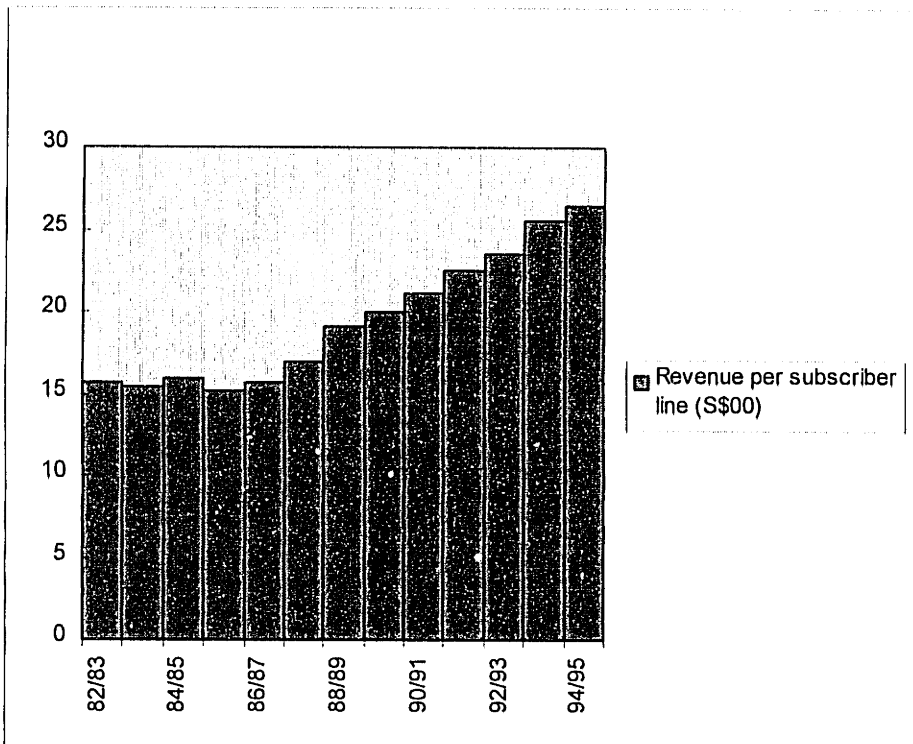


Exhibit 8-6: Increase in revenue per subscriber<sup>6</sup>.

<sup>5</sup> Source: Compiled from Singapore Telecom Annual Reports.

<sup>6</sup> Source: Compiled from Singapore Telecom Annual Reports.

The reason for this excellent record is mainly due to the proactive approach of management in continually striving for superior results and to prepare for competition head-on. Its strategy has rightly followed what other dominant carriers in other countries had done, namely:

- Restructuring;
- Globalization;
- Strategic Alliance;
- Infrastructure modernization and development;
- Cost reduction, rationalization and productivity improvement;
- Continual service enhancement and new service provision; and
- Research and development.

Of course, during the implementation of its strategies, there would be obstacles but they were not show-stoppers since management is quick to respond and was able to manage change effectively. Singapore Telecom also has the benefit of not being alone in this ever changing competitive environment and was able to learn from and adapt what others have experienced.

For the fiscal year 1995/96, the growth of revenue was able to meet the expectation of a double digit growth. (See Exhibit 8-7 for past growth data). As long as management focuses on the critical success factors and excel in managing them, its growth prospect should be bright.



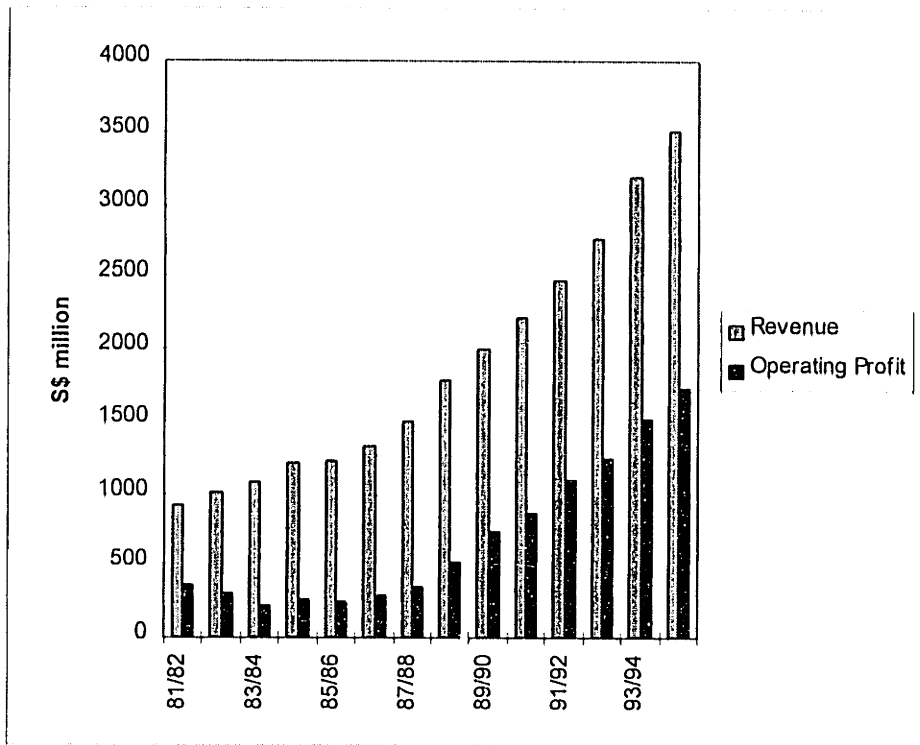


Exhibit 8-7: Past Growth Data<sup>7</sup>.

## FLEXIBILITY

As huge investments are normally required to implement a service, I would say that there is an inherent inflexibility in planning for new service provision. In addition, an aspect of the investment undertaken in the globalization drive is the long period for break-even and because of this, the risk of making a wrong investment is high. Hence, inevitably, Singapore Telecom's strategy on globalization, infrastructure modernization and development is not as flexible as one would desire. Such danger of inflexibility should be, to a certain extent, mitigated for risk management in terms of field trials or pilot projects as well as diversification of investment but without loss of focus. Thus the formulation of strategies has to take flexibility or adaptability into account. This is easier said than done and risk management in terms of finance and technology is thus very important.

<sup>7</sup> Source: Compiled from Singapore Telecom Annual Reports.

## SUMMARY

In this chapter, some recommendations to improve Singapore Telecom's performance are put forward after identifying areas of improvement through the Positioning, Sustainability, Valuation and Flexibility framework. Such recommendations in no way diminish the excellent work done by Singapore Telecom in its drive to sustain superior performance in the face of ever increasing competition and liberalization in Singapore's telecommunications industry.

## 9. CONCLUSION

Singapore Telecom is one of the best managed companies in Singapore as well as one of the top telecommunications carriers in the world. It has braced itself for future increasing competition in a positive way, taking note of what other dominant carriers have been doing, the pitfalls to be avoided and in a sense, its experience could also render itself as a learning example to other countries. The excellent financial results as shown in the previous chapter is a testimony that Singapore Telecom is moving in the right direction.

In this thesis, I have put forward quite a few of recommendations for Singapore Telecom to adopt in order to improve its performance. To summarize, they are:

- implementing a systematic approach to corporate, SBU and functional strategic planning in line with the method proposed by Arnaldo Hax and Nicolas Majluf where a ten-task corporate strategic approach is involved;
- expanding and enhancing the productivity measurements as the linkage between the measurements and the critical success factors are not obvious or lacking;
- enhancing the linkage between management control and the reward system to ensure strategic accountability.
- putting in more effort by middle management to disseminate top management's strategic vision and thinking through greater interaction with staff;
- formulating a corporate credo and creating a culture where the employees accept wholeheartedly cross functional and matrix reporting;
- including other useful indicators like cost of capital, economic value add, market value add and market to book ratio;
- improving the budget process especially on resource allocation in order to reduce the time taken to formulate such resource allocation;

- having no need to strive to be at the forefront of technology as more important for Singapore Telecom is to be innovative and come out with applications based on existing technology;
- putting more emphasis on assessing customers' potential interest and needs as well as identifying aspects of the technology for user-friendliness improvement during technical field trials;
- speeding up the procurement process through less bureaucracy, concise and precise specifications and requirements;
- nurturing its international investments by putting its best people to run and manage them with the underlying support and control structures further strengthened;
- acquiring the core and augmented skills to manage the foreign partners in its joint ventures or alliances;
- accelerating the hiring of new blood from outside as well as giving exposure to its managers and staff through internal transfers or posting to its many subsidiaries;
- predicting the new trend in technology and sending its people for training on new managerial skills to meet the need for new leadership talent;
- decentralizing the planning function of the Master Planning Division to the SBUs for more effectiveness and productivity;
- studying the value creation at each business level continually especially with regard to profitability versus product life cycle;
- using as far as possible, off-the-shelf systems which still meet the needs of customer support in designing the support system;
- reviewing the old ways of performing things so that the information technology system would not just simply automate the sub-optimal manual ways of doing things;
- training its marketing and sales staff on competition intelligence to put Singapore Telecom in a better position to compete effectively;

- monitoring the new services offered by other carriers in other countries to improve the speed of new service provision;
- assessing continuously and more regularly through customer surveys and mystery customers the service quality standard;
- adopting an open system with dual appraisal ratings for the appraisal system i.e., absolute rating on job requirements (with no targeted distribution) for the purpose of determining the annual increment and relative rating of performance for the purpose of bonus payments;
- extending the stock option plan to a greater majority of the employees;
- considering the determinants of managerial as well as staff compensation in terms of linking individual and group performance with short and long term time horizons;
- easing job transfer in the case of mismatch in job and aptitude;
- reducing the uncertainty created by the ever-changing environment by empowerment like involvement in the decision making process and delegation; and
- injecting flexibility to its strategic positioning via risk management in terms of finance and technology.