

A CASE STUDY - THE CORDLESS ACCESS SERVICE MARKETING  
STRATEGY FOR HUTCHISON TELECOMMUNICATIONS

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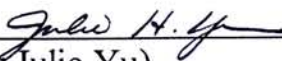


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## ABSTRACT

In response to the granting of new licenses on Personal Communications Network (PCN) and Cordless Access Service (CAS), Hutchison Telecommunications has joined the bid for both service licenses. Getting these licenses means that the company could expand and defend its market share, but at the same time, the new services will also create internal competition with the services the company presently provides. Thus, Hutchison Telecommunications must formulate an appropriate marketing strategy for finding the right marketplace for each service. This study aims to solve this marketing problem; CAS is chosen for investigation.

Market survey showed that people are quite demanding towards the mobile phone service. CAS offers the benefit of low priced service, but it is not very cost effective for supporting wide coverage and high mobility, so it should therefore not compete directly with the mobile phone service. However, there is a latent demand among people for additional phone lines to be used at home. This poses the opportunity for CAS: a low cost service with simple network infrastructure and huge network capacity that can compete with fixed-wire line. And what is more, it can give extra values of both indoor and outdoor mobility. All these characteristics allow the company to charge the service at a premium in between the fixed-wire line and mobile phone service.

The focus of promotion should be on introducing the concept of personal communications. The company can build its competitive advantage on customer

support service and company image. Moreover, its extensive retail outlets can provide an efficient and quick channel for accessing the mass market.

## TABLE OF CONTENTS

ABSTRACT .....	ii
TABLE OF CONTENTS .....	iv
LIST OF TABLES .....	vii
 Chapter	
I. BACKGROUND .....	1
Personal Communication.....	1
CAS and Other Mobile / Wireless Service .....	2
Hutchison Telecommunications Ltd.: A Bidder for CAS License .....	6
Objectives of This Study .....	9
II. MACROENVIRONMENTAL ANALYSIS .....	10
Demographic .....	10
Working Population by Age .....	10
Students and Housewives .....	12
Household Size and Household Income .....	13
Economic.....	14
Increasing GDP Per Capita.....	14
The Growth of the Service Industry.....	14
Socio-cultural .....	16
Information Age.....	16
Increasing Social Activity of People.....	17
Mobile Phone No Longer Serving as a Status Symbol, but a Basic Product .....	18
Industry .....	19
Industry at a glance .....	19
The Local Situation .....	20
Local Market Analysis.....	22
Competition .....	28
Regulation .....	30
Technology .....	35
Technology Highlights.....	35
Mobile Phone Technologies.....	40
Future Technology Development.....	44
III. PRODUCT ANALYSIS .....	47
Product Definition.....	47
Product Comparisons .....	48
Product Strengths .....	49
Two-way Accessibility .....	49

Supports Some Mobility.....	49
Provide Higher Service Availability .....	50
Clear Voice Quality.....	50
Allows for a Handy Phone Handset .....	51
Low Power Consumption for Handset.....	51
Relatively Low Infrastructure Investment .....	51
Ease of Installation.....	51
Integration with Paging Service / Messaging Service .....	52
Better Security .....	52
Product Weaknesses .....	53
High Running Cost.....	53
Only Low Mobility.....	54
Confidence Problem Towards New Technology .....	54
Product Opportunities.....	55
Compete with Mobile Phones and CT-2 .....	55
Compete as Secondary Fixed-wire Phones, with Enhanced Mobility .....	55
Product Threats .....	56
Price War in the Cellular Market .....	56
High Rental Costs for Installation of Base Stations .....	56
Availability of Network Infrastructure .....	57
 IV. COMPANY ANALYSIS.....	 59
Strengths.....	59
Marketing and Technical Expertise in Wireless Telecommunications Services.....	59
Strong Financial Background.....	61
Ride on Existing Corporate Infrastructure .....	62
Comprehensive Product Range.....	65
Weaknesses.....	67
Little Product Innovation.....	67
Integration of Different Business Units .....	67
Lack of Fixed Network Infrastructure.....	68
Opportunities.....	69
Economies of Scale .....	69
Preserve its Positions in the Market .....	69
Threats	
Price Competition From Mobile Phone Market.....	72
Competition from PCN.....	72
A Number of Competitors in the Market .....	72
 V. MARKET SURVEY .....	 74
Market Survey Objective.....	74
Methodology .....	75
The Target Population.....	75
Data Collection .....	75
Questionnaire Design .....	76
Data Analysis .....	77
Results and Findings.....	79
Existing Service Usage.....	80
Reasons not Using Mobile Phones Now .....	81
Functions Perceived for Mobile Phone Usage .....	81
Second Home Telephone Line .....	82
Having Mobile Home Telephone .....	83
Consideration for Subscribing to the Mobile Phone	

Service .....	83
Rating of Phone Services .....	84
Rating of Handset Characteristics .....	85
Usage Pattern .....	86
Pricing Scheme .....	88
Maximum Charge for Phone Service and Handset .....	89
Company Selection .....	91
Information Source .....	92
Distribution Channel .....	92
<b>VI. MARKETING STRATEGY .....</b>	<b>93</b>
Product Strategy .....	94
Product Concepts .....	94
The Phone Services .....	96
Handset Characteristics .....	98
After-Sales Services .....	99
Supplier's Concern .....	99
Pricing Strategy .....	101
Pricing Objective and Strategy .....	101
Price Setting .....	103
Price of Close Substitute .....	104
Promotional Strategy .....	108
Target Audience .....	108
Message Appeal .....	108
Promotional Program .....	109
Distribution Strategy .....	112
Utilize Extensive Retail Outlet .....	112
Use of Direct Sales Team for Approaching the Employees of Large Corporation .....	112
Road Shows .....	113
<b>VII. LIMITATIONS AND FURTHER STUDIES .....</b>	<b>114</b>
<b>APPENDICES .....</b>	<b>118</b>
<b>BIBLIOGRAPHY .....</b>	<b>139</b>



## LIST OF TABLE

1.	No. of Customers of Mobile Phone, CT-2 and Paging Services .....	3
2.	No. of Working Population at Different Salary Levels .....	11
3.	No. of Service Providers and Customers for Various Wireless Services .....	23
4.	Service Providers for Various Wireless Services .....	31
5.	A Comparison of Various Wireless Communication Technologies ...	48
6.	A Time Table on the Launch of Various Wireless Services by Hutchison Telecommunications .....	60
7.	Investment Amount by the Mobile Phone Companies .....	62
8.	No. of Retail Outlets Owned by Hutchison Whampoa Ltd .....	63
9.	No. of Retail Outlets Owned by Potential CAS Providers .....	64
10.	No. of Hutchison Telecom Customers in CT-2 and Paging Service..	66
11.	Target Sample Distribution by Sex and Age .....	76
12.	A Comparison of the Target and Actual Sample Distribution by Age and Sex .....	79
13.	Sample Distribution of CT-2, Pager and Mobile Phone Users .....	80
14.	Survey Finding - Overall Rating of Different Handset Characteristics .....	85
15.	Service Charge on Mobile Phone, Residential Telephone Line and Call Forwarding Feature .....	105
16.	Suggested Tariff Table for CAS .....	106

## CHAPTER I

### BACKGROUND: NEW MARKET CHALLENGE - THE INTRODUCTION OF CORDLESS ACCESS SERVICE (CAS)

#### Personal Communication

Personal communication can be said to be one of the major goals which guides the future development of telecommunications. As the society gets more affluent, people have more disposable income and are getting more socially active, this has created strong desire for personal communication service. Also, with information gaining its strategic importance in the business environment, there is increasingly high expectation for having efficient and effective means of communications. All these factors have led to the development for the next generation mobile communications systems, namely Personal Communications Services (PCS/PCN), which allow people to communicate with each other in any medium, at any time and anywhere, in a reliable and cost-effective way.

In this study, the term personal communication services is used in a more general sense referring to those services which aim to allow people to communicate freely without connecting to a wireline, which restricts people's mobility. Existing services falling into this definition include mobile phone service, cordless telephone service and paging service.

### CAS and Other Mobile / Wireless Service

Mobile phone service was first introduced to Hong Kong in 1985. The service is mainly for voice communication. It enables people to make and receive phone calls at any place they like (provided it is covered by the network) and the communication can continue even if they are moving. The latest technologies include Global System for Mobile and (GSM) and Code Division Multiple Access (CDMA). Compared with the past analogue technology, these digital standards are developed to increase network capacity and better services in terms of more value-added features and better security. However, this mobile phone service is quite expensive for the public in general, with limited network capacity.

Cordless Telephone service - Second generation (CT-2) is also for voice communication but can be described as providing a lower level of service. The service only allows people to make phone calls at any place covered by the network, but one cannot receive messages. The service also supports limited mobility, that is, people can continue their conversations provided they stay at or walk slowly within the area served by that particular base station. Thus, this service aims to provide lower level of convenience at affordable cost.

Unlike the above, paging is a messaging service. The function is to alert the called party that somebody wants to reach him, which is basically simple message broadcasting. On technology comparison, paging service can provide widespread coverage, i.e., more places can easily be reached by paging stations than by mobile technology, at very low cost. In addition, since the called party can decide whether and when to respond to the calling party, the pager gives the extra benefit of call

screening. Due to the keen competition, the paging service providers are now supplying some value-added information services, such as financial news and weather forecasts to their customers through their broadcasting system. However, with its limited functionality, paging cannot address the increasing demand in the market for true personal communications.

As introduced earlier, the three services try to target the personal communications market. This market is highly competitive not only in terms of the number of services available, but each service group is also provided by numerous companies. At present, there are 4 mobile phone operators, 3 CT-2 service providers and over 30 companies providing the paging service. The market size is estimated to be 3 million people in the 15-49 age group. Below are the number of customers as at February 1995:

TABLE 1

NO. OF CUSTOMERS OF MOBILE PHONE, CT-2 AND PAGING SERVICES

Service	No. of Customers
Mobile Phone	458,515
CT-2 Service	176,000
Paging	1,374,501

Source: Office of the Telecommunications Authority, February 1995

The development of the personal communications market has been driven by two external forces, technology advancement and government policy. The technology development has been aiming at providing the service at lower cost and bringing in

more value-added features, so that the service(s) can be made available or affordable to everyone. However, there is no clear single path for technological development; this has created some uncertainty as to how the new services will impact, and how they will interrelate.

Similarly, the government also would like to see the service benefits enjoyed by more people and the price more reasonable. It is no wonder why it is keen on introducing new service technology to the market and bringing more competition into the marketplace. Having these forces acting behind the scene, this naturally leads to the introduction of new technologies: Personal Communication Network (PCN) and Cordless Access Service (CAS) to the Hong Kong market.

PCN can be considered as an advancement of mobile phone technology. The PCN involves the building of networks based on radio technology and the service provider will have its own telephone switch for processing the calls. One major advantage of PCN over the existing mobile technology is its relatively lower cost structure. In addition, this service aims to provide a greater functional flexibility than current mobile or fixed services, either in conjunction with those services or as a substitute for them. Not more than 6 PCN licenses will be granted by the government.

On the other hand, Cordless Access Service (CAS) can be described as an enhancement of Cordless Telephone service (CT-2), as both services will provide cordless access to the local telephone network, such that customers can bring with them the cordless telephone handset and make phone call at anywhere. However, CAS addresses most of the limitations with CT-2, including allowing one to make and receive phone calls, providing low mobility at walking speed without having calls dropped. With these enhanced functional capabilities, together with its good voice

quality and high network capacity, the CAS is expected to replace the existing CT-2 service for provision of cordless telephone services at very affordable costs. The government intends to give not more than 4 CAS licenses.

However, the different network architectures of the PCN and CAS services have implications for the cost structures. PCN is expected to be at a relatively higher cost than CAS. On the service comparison, the PCN can support higher mobility than CAS, but the latter gives better voice quality service.

With a careful examination of today's market, it can be seen that the two extremes, i.e., the high and low ends are well served by the existing products, that is, mobile phone for the high end market, while the CT2 and paging services target the low end market. However, with improved purchasing power and increasing high expectation for personal communications, more customers who cannot afford to the mobile phone service are willing to pay a higher price than a CT2 or pager in order to enjoy more service benefits. This group of customers present a market opportunity not only to CAS but also for PCN and the existing products. Without defining the target market and building up its own distinctive advantage, the launch of the CAS will soon end up as a price competition with others.

Therefore this study's objective is to determine the appropriate marketing strategy for the CAS. The strategy is recommended under the context of a specific telecommunications company, Hutchison Telecom, which is one of the bidders for the CAS license.

### Hutchison Telecommunications Ltd : A Bidder for CAS License

Hutchison Telecommunications Ltd is one of the business divisions of the Hutchison Whampoa Group. As the name suggests, it is responsible for all the telecommunication business. There have been three major subsidiaries under it namely, Hutchison Telephone Co. Ltd, Hutchison Paging and Hutchison Communications. By Jan 1996, the three companies merged together forming Hutchison Telecommunications (HK) Ltd. The business responsibilities of these previous subsidiaries are as follows:

- Hutchison Telephone:- Mobile telephone and trunk radio service
- Hutchison Paging:- Paging and CT2 services
- Hutchison Communications:- Local fixed network services

Hutchison Telecommunication is undeniably the second largest player in the local telecommunications industry, behind Hong Kong Telecom. This is based not only on the company's wide range telecommunications business, but also in terms of its market share in each of the telecommunications services. In mobile, paging and CT2 business, the company has been the market leader. With the recent keen competition, its market leading position has been challenged by the other companies. The establishment of Hutchison Communications in 1994 has led the group into a new era. In the past, the telecommunications business focused purely on wireless services. But with the award of the fixed telephone network service license, the group is now involved also in the wireline service. This gives the group the potential of offering a total solution to meet the communication needs of its consumers.

The announcement of the issuance of a CAS license, this has had a great impact on the group. On an offensive side, the new service provides a market opportunity for the company to take in more customers. But the service introduction also serves for protecting its market share. This is because the CAS may also take away the existing customers that the company has if it is not to provide the service on its own.

The competition among different product classes can be illustrated by the following examples. Since the CAS will have the capability to make and receive calls, it is most definitely will replace CT2 service. In the past, there has been the product bundling of CT2 and paging services for providing a complete solution, i.e., the pager alerts the customer of an incoming call and with the CT2, he or she can return the call immediately. But with the improved capability of CAS to both make and receive calls, there can be a substitution effect on the paging service; if customer is willing to pay a little bit higher price to get an enhanced service, particularly if CAS is at a relatively low cost. But the reverse can also exist: with the call screening function provided by the pager service, i.e., the pager holder can return call selectively, the pager can still be complementary to CAS / PCN services.

The previous discussion highlighted that the cost and functionality differences of CAS and PCN may not be that huge or distinctive, i.e., both CAS and PCN support mobility and the difference just a matter of degree. Thus if either service moves a step towards the other end of the continuum, it is likely to create direct competition.

Thus, the introduction of CAS by Hutchison Telecom inevitably leads to internal product competition, in the way discussed above. At present, the company provides a complete range of mobile telephone services. It is also going to apply for



the PCN license, so that its existing GSM mobile phone customers will not be taken away by the new PCN service operator as well. Apparently it will be more beneficial for the group to identify areas in which different services can cooperate with each other, rather than compete. The company has already taken a wise step of merging the different subsidiaries together so as to achieve a synergistic effect, and also to avoid competition which have arisen because of company politics.

But the organisational change just paved the first step to regulate its different telecommunications businesses in a harmonious way. A more important step is to formulate a comprehensive marketing strategy, so that there will be a marketplace for each service.

### Objectives of This Study

This study aims to solve the marketing problem faced by Hutchison Telecom. However, before any sensible strategy can be formulated, one needs to have concrete understanding of what is demanded from the customers, which can be achieved from conducting a marketing research. The objectives for the market research include:

- To understand people's general attitude towards the concept of personal communications services
- To identify the target market for CAS
- To find out the right marketing appeals for the target market identified

In order for the management of Hutchison Telecom to make right decisions on their marketing strategy, a very clear understanding about the market, the product and the company is also very important. These objectives include:

- To understand the product strengths and weaknesses of the CAS in relation to other close substitutes
- To analyze Hutchison Telecom's strengths and weaknesses
- To identify the target market for CAS by matching the product characteristics with the market requirements
- To develop the right marketing mix in terms of product, pricing, promotion and distribution for Hutchison Telecom to launch the CAS

## CHAPTER II

### MACROENVIRONMENTAL ANALYSIS

#### Demographic

The following discussion is an extract of some relevant figures from the latest 1991 Population Census Report prepared by the HK Government Census and Statistic Department. The analysis gives an indication of the market potential of personal communication services.

#### Working Population by Age

The total number of working population which falls into the 15- 44 age range was about 2 million in 1991. According to the salary level in 1991, people who earn \$6,000 or above are classified as middle or upper income group. This group of people are believed to have the purchasing power and willingness to afford personal communication services which give them extra convenience. This will form the primary market segment for personal communication services.

In 1991, the number of people falling into the middle and high income group was about one million, accounting for 46% of the total working population. With a 2% projected annual population growth, and assuming the income and age distribution

remain more or less the same, the middle and high income group in 1996 will be estimated as nearly 1.1 million people.

The above can be given as a prudent estimation. As one shall see in the analysis below, the price of various personal communication services have been driven down by both competition and technology. This in turn has made the services to be more available to people in the upper lower income group. If the next income bracket at \$4,000 - \$5,999 per month (salary level in 1991) is also taken into account, the primary market segment will increase to over 1.5 million people. This accounts for 60 % of the total working population. Using the same projection as above, the whole group of people will be close to 1.8 million by 1996. The data are summarized as below:

TABLE 2

## NO. OF WORKING POPULATION AT DIFFERENT SALARY LEVELS

<i>Year</i>	<i>No. of People (salary at \$6,000p.m. or above – 1991 level)</i>	<i>No. of People (salary at \$ 4,000p.m. or above – 1991 level)</i>
1991	965,414	1,584,477
1996	1,065,895 (estimation)	1,749,390 (estimation)

Source: HK Government Census & Statistics Report, 1991

If the above estimation is compared with the existing number of customers of the mobile and paging services, one can see that there is still ample room for market growth. According to the statistics provided by the Office of the Telecommunications Authority (OFTA), in January 1996, the number of pager users and mobile phone users was about 1.1 million and 720,000 people respectively. The industry foresees

that the pager user is likely to upgrade to mobile phone service, since the latter gives more value-added services and convenience. If this is the case, the market potential for mobile phone service or future services which provide better value for money will be more than double the growth of the existing market, i.e., from existing mobile phone users of 720,000 people to about 1.8 million people.

### Students and Housewives

Although these two groups of people are not economically active, they are still the target market for the personal communication services. Their purchasing power is supported by their family. As this will be further discussed in the socio-cultural and economics analysis below, the living standard over the past decade has increased, and people are also engaged in more social activities. This is particularly true among the young people whose affection needs will keep them close to their peer groups. This builds up their need for keeping in close touch with their friends. It is no wonder the student sector has been one of the target segments for pager and CT2 service.

On the other hand, the traditional role of a housewife has been changing. Nowadays, a housewife does not necessarily have to stay at home all the time, they will have their own social group and activities. Their ties with the society is much stronger than before. This to an extent generates the need for better communication.

According to the Population Census Report, the number of students aged between 15-24, i.e., secondary or undergraduate students, is over 320,000. The number of housewives, on the other hand, is over 260,000. If the growth of these two groups of people follows the annual total population growth of 2%, the estimated

number of students and housewives is 350,000 and 290,000 respectively, by 1996. This generates additional 640,000 potential customers to the personal communications service.

### Household Size and Household Income

Further reference about the market potential can be drawn by the household size and household income. This helps to delineate those students and housewives with a certain household income for supporting their purchase of the service. The 1991 figure indicates that households with three or more members and income level at \$10,000 or above is about 600,000. The students and housewives of these households are likely the targets of the service.

## Economic

### Increasing GDP Per Capita

The Hong Kong economy has been growing very well over past years. An indicator is the growth of GDP per capita. In 1990, the GDP per capita was HK\$ 102,121 and by 1995, the figure has jumped to HK\$122,908 (at constant 1990 market prices); this represents a growth of 20% in five years' time. With people becoming more affluent, they are more prepared to buy premium products and services which increase their living standard. Any personal communication service certainly falls into this product category.

### The Growth of the Service Industry

As the restructuring of the economy is occurring, the service sector keeps growing, while the manufacturing sector continues to decline. The 1994 figure showed that the industry sector, which includes manufacturing and construction industry, etc., has made a 16.9% contribution to the GDP; this indicates a drop, as the percentage contribution in 1991 was 25.3 %.

On the other hand, the percentage contribution of the services sector has increased from 74.5 % in 1991 to 83 % in 1994. The services sector includes the import / export trades, transport, financing and business services, etc.

As dictated by the business nature, the communication requirements of the services sector will be stronger than the industry sector, in the sense that they tend to make more outside contacts as their daily operation involves more coordination and liaison work. The expansion of the service sector will pose a market opportunity for the telecommunication industry.



### Socio-cultural

The development of the personal communications market is also affected by socio-cultural factors. The essence of communication means the delivery of messages, so as to allow people to keep in contact with the outside world. Over the past two decades, there have been the changes in the information requirements and patterns of people's social activities. All these are the driving forces of the personal communications service market.

### Information Age

People see the growing importance of getting timely information. This is obvious in the business world. But this trend is also found among the general public. This is somehow like a self-reinforcing cycle. With more development in the communication media, the information flow is quicker. As people do not want themselves falling behind the others in knowing the latest information and losing contact with the world, this in turn builds up more demand for communication needs. As this self-reinforcing cycle continues, this accumulates more demand for easy and convenient communication. With this basic demand setting the foundation for the growth of the communication industry, the recent technological developments have translated the requirement or emphasized the development of communication more on a personal basis. The technological advancement has made the message delivery less bound by time and geographical factors. The information dissemination can be made

more on an individual basis. This means the information can be transmitted in any format to the person, irrespective of where he or she is located.

### Increasing Social Activity of People

With the society becoming more affluent, people engage in more social activities. This has increased the communication need. Such social change has been magnified in the youth sector. The young people nowadays are more socially active than before. They are keen to maintain connections with their peer groups. On the other hand, with family size getting smaller, the materialistic support by the parents can be more. These young people can have the necessary purchasing power to subscribe to the communication services, so that they can reach and be reached by their peers more easily. Such need in fact has contributed to the growth of the paging and CT2 markets.

Increased social activeness is also seen among the housewives. With the general educational level raised and influenced by the society, housewives nowadays also pay attention to developing their own social groups, and are more willing to participate in social activities for widening their perspective. Their increased activity also generates the need for communication.

Not only are people getting more socially active, the living pattern has also changed. Nowadays, it is common among young couples that both husband and wife have to go out to work. Each will maintain his or her own friends. With both spending less time at home, but more time outside at work or engaging in social activities, the communication need with each other will also increase.

## Mobile Phone No Longer Serving as a Status Symbol, but a Basic Product

When the mobile phone was first launched in the market, its high price made the service available to only those upper classes and business managers. Such association has built up the premium image of the mobile phone. People see that the possession of a mobile phone is a status symbol. But as more companies enter into the market and technology improves, the price of mobile phones has been driven down. The service is affordable by more people. With the increased need for more readily and convenient communication, more people have become users of the service. The social function of mobile phone as a status symbol has diminished. This in fact has been supported from our survey finding, which shows that very few people see the mobile phone as a status symbol. Instead, the product has become a mass product and people see mainly the functional value of the mobile phone service. With the product becoming a basic product, this can create a stimulating effect which leads to more people subscribing so that they can communicate on the same level.

To summarize, the above socio-cultural changes have increased people's needs for communication. Facilitated by technological improvements, such needs have been channelled as communication on a personal basis, and the service has moved from being perceived as a social status symbol as in the case of mobile phones to a mass product which really aims to meet the basic need for a closer touch with the outside world.

## Industry

### Industry at a glance

The telecommunications industry is a fast-growing, high technology and dynamic industry. However, because of the nature of the industry, there are some elements that are unique for the telecommunications industry. First, the industry has her strategic significance on political, security and defense concerns, and thus has always been under strict government supervision and regulation. Second, with the emergence of the Information Age, this industry has become one of the most important factors for social and economic growth and development. It is one of the top priorities for a country to maximize the economic efficiency for its telecommunications industry. In the past, most policymakers favoured a “natural monopoly” of the industry to achieve “economic efficiency” based on the arguments of national allocative efficiency and infant industry rationale.

However, since the early 1980s, there has been a world trend towards adoption of a new paradigm for competition and liberalism of the telecommunications industry, which used to be an industry of monopoly provision shielded from normal market competition. The argument for the liberalization is that the telecommunication industry is no longer an infant industry. As there is increasing demand and dependency from businesses on telecommunication services, liberalization can allow the market mechanism to enhance efficiency on allocation of resources and healthy development of the industry, thus maximizing the economic benefits.

The new competition for the telecommunications industry may appear in many forms. First, as the technology for telecommunications services matures, the costs of equipment and infra-structural support are getting lower. Thus, capital investment required for initial startup is minimized, which can cause the big market players to quickly lose their market share to small niche companies, which are much more flexible and adaptive. It is possible that the telecommunications market will be changing from the original monopoly structure to oligopoly and then towards monopolistic oligopoly, similar to most other service sector industries. Second, in addition to external competition, telecommunication service providers are subject to internal competition among different product substitutes. The tension is the choice between current and new technology, with the former being a source of profit generation, while the latter is needed to remain competitive and for future survival. The dilemma is further intensified by the ever-changing nature of technology industries, with limited life cycles for most products. All the telecommunications service providers have to be well-prepared for this challenge in the new competitive environment.

#### The Local Situation

In Hong Kong, the local telephone service used to be operated by the Hong Kong Telephone Company Limited as a public franchise under the Telephone Ordinance. The company started to digitalize its telephone network in 1984, and made Hong Kong the first major city in the world to have a fully digitalised telephone network when the task was completed in July 1993. Data communication services are operated through a public data network called Datapak.

However, this franchise for Hong Kong Telephone Company Limited expired on June 30, 1995, denoting a new era of development in the industry. With the introduction of liberalization and competition, the market changed from the original monopoly structure to an oligopoly. Other than the Hong Kong Telephone Company, the Government has licensed three new FTNS (Fixed Telecommunications Network Services) operators: Hutchison Communications Ltd., New T&T Hong Kong and New World Telephone Ltd.

Hong Kong Telecom International Limited, under an exclusive license issued within the provisions of the Telecommunication Ordinance, provides basic international telecommunications services in Hong Kong, plus the local telex and telegram services.

With the emergence of mobile telecommunication technology, the telecommunications industry started to branch out into two major streams in the 1980s, namely, fixed and mobile telecommunications network services. At present, there are three major types of mobile telecommunications services (paging, mobile phones and CT2), while others will be introduced in the near future with the advancement of new technologies.

The public radio paging service has become one of the most popular means of communication in Hong Kong. Due to the relatively cheap startup cost of paging services with minimal barriers to entry, including no practical limit to the number of licenses and availability of spectrum, around 38 paging licenses have been issued, being held by about 20 companies, and utilizing 62 radio channels.

In 1984, Public Mobile Radiotelephone Service (PMRS) was introduced, with four service providers operating under seven systems (one AMPS, two TACS, one

ETACS, one USDC and two GSM systems). Telepoint (CT-2) service was introduced in early 1992, with four licenses issued.

In the future, OFTA is introducing two new technologies for the MTNS market, namely PCS and CAS. The initial plan is to issue four (4) and six (6) licenses, respectively, for these new services (details are discussed in the regulatory macroenvironmental analysis section).

### Local Market Analysis

In its broadest sense, CAS attempts to meet the communications needs of any individual. However, at the present stage of technological development, there are two major streams of telecommunications services. First is the Fixed Network Telecommunications Service (FTNS), which is accessed through physical linkage of cables with the rest of the network. Second is the Mobile Network Telecommunications Service (MTNS), which can be accessed through radio frequency waves transmitted across the air.

The typical service provided by FTNS is the fixed telephone service installed in most of the buildings. This is the most traditional and widely accepted telecommunication service at a very low cost (\$65 per line per month for residential use and \$98 per line per month for commercial use) and good voice quality. Penetration of the telephone network is also very high in Hong Kong. Figures showed that there were 3.8 million telephones served by over 2.9 million exchange lines as of March 1994, with a density of approximately 65 telephones or 50 lines per 100 population. Also, there were over 233,000 facsimile lines in use.

On the other hand, the existing typical services for MTNS are Public Radio Paging Service, Public Mobile Radiotelephone Service (cellular phone) and Telepoint (CT-2). The number of service providers and customers for each service are shown in the table below:

TABLE 3

NO. OF SERVICE PROVIDERS AND CUSTOMERS FOR VARIOUS  
WIRELESS SERVICES

Service	No. of Service providers	No of Customers (3/94)	No. of Customers (2/96)
Paging	about 30	1,252,000	1,124,457
Cellular Phones	4	318,000	763,231
CT2	3	139,000	86,464

Source: Office of the Telecommunications Authority, March 1996

We can see a downward trend for both paging and CT2 services during the past two years. However, the drop for CT2 is much more serious than that for paging (-37.80% vs. -10.19%). On the contrary, dramatic growth in the cellular phone market (+140%) is observed. It is expected that the market for mobile telephone communications would further boom and flourish in the coming years.

Actually, CT-2 is a hybrid form of FTNS and MTNS. It basically provides air interface between the CT-2 handset and the telepoint base station, which is, in turn, connected to the public telephone network through FTNS. As its name implies, it is a second generation cordless phone, providing similar functions as the in-house cordless phones (CT-1) but with the enhancement for outdoor usage. However, due to many



technological limitations of the product, CT-2 has not gained much popularity with limited future development.

As for CAS, which is a new technology positioned for replacing CT-2, the service can provide low-cost, low mobility telecommunications service, even in congested areas with high channel demand. With an increasing demand for telecommunications services, it is no longer feasible to distinguish the use of mobile phones to the outdoors, and fixed telephone services to the indoors. People would not remain in one location, even within an indoor area, at home or in the office. Moreover, the trend for personal telecommunications would not tolerate having multiple telephone numbers for reaching people at different locations, though this is partly resolved by the call forwarding function at present. The demand for mobile phones to replace the existing fixed telephone service is perceived to be very high, especially if people's attitude towards mobile telecommunications service can be revolutionized: perceiving the mobile phone, rather than the fixed telephone service, as a basic necessity.

The external forces influencing the local market are summarised below:

#### Threat of new entrants

The telecommunications industry is strictly regulated by the Office of Telecommunications Authority (OFTA). No telecommunications operator can provide mobile telecommunications services unless it has obtained a license from OFTA. Radio frequency spectrum, much must be allocated for exclusive usage by each telecommunication services operator, is very limited and has to be shared by the different telecommunications services and different operators. It is the responsibility of

OFTA to carefully manage and provide maximum economic efficiency for limited resource allocation. Therefore the issuance of new licenses would require many considerations. With this legal restriction, together with the extensive capital investment required, the barrier for entry is very high. Initially, OFTA will only issue no more than four CAS licenses.

### Bargaining power of buyers

Hong Kong is one of the cities within the Asia-Pacific region that has the best telecommunications infrastructure, with very high teledensity (50%). Nearly every household has a telephone to serve its basic communications need. Also, public telephones are also easily accessible in most of the urban and rural areas. Thus, the general need for telecommunications service is well satisfied with the existing telephone network, and extra mobility provided by mobile telecommunications network services is regarded by most people as a premium service .

The demand for a telephone line for indoor use is a necessity to most people, and yet in the past only one company, i.e., Hong Kong Telecom, can provide the service. The bargaining power of the buyers can be said to be low. Not owing to the protection by the government for defending the public interest, the customers suffer from high price. Knowing the possible drawbacks of having a monopoly in the market, the government has decided to open the market for competition. In 1995, three other companies, namely, Hutchison Communications, New T & T and New World Telephone, were awarded with the FTNS license. However, none of them is ready to provide the fixed line service. As mentioned above, even though only one company is now providing the service, the customer has been enjoying low tariff service under

government protection. Unless a very competitive price can be offered, with very visible value added on, it would be rather difficult to persuade the mass population to switch to other services.

For the mobile phone services, the bargaining power of buyers is considered as high in the sense that they can choose from various service providers. However, the overall demand growth is still bound by the spectrum capacity, and thus sets a bottom line for limiting the bargaining power of buyers. This may also explain why the service price has not come down until the network capacity is increased with the introduction of cellular digital technology. It is the government's intention to raise the bargaining power of the buyers in the future by introducing competition; it will issue not more than six PCN licenses and not more than four CAS licenses.

#### Bargaining power of suppliers

Bargaining power of suppliers depends on the firms. For the CAS equipment, there are quite a number of suppliers in the market. As the technology matures, it is expected to have more market suppliers which would increase the competition in the supplier market. For the network infra-structure, nearly everyone still has to rely on the digital lines provided by Hong Kong Telecom, and this would continue for some years into the foreseeable future. Another type of supplier that could also cause great concern are the landlords who would let out space for installation of the base stations. As competition for the CAS market increases, with all of the players trying to expand coverage of their network, the bargaining power of these landlord could be much enhanced.

### Threat of substitute products

As mentioned before, CAS is an emerging product that could replace the CT-2, which is kind of a hybrid product between FTNS and MTNS. Thus, both fixed-wire phones and cellular mobile phones could be perceived as substitute products, however, they could actually form a different sense or meaning to the customers, depending on how the product is presented by the firms. To compete with fixed-wire phones, the foremost consideration is cost, due to the predominantly consumer-oriented and regulated environment. However, to compete with cellular mobile phones, the quality of network service is the biggest concern, because of the technology difference for these two products.

### Competition

The personal communications market is faced with ever-increasing competition. This also largely ties in with the product life cycle.

The paging market is the first one which entered the maturity stage. At present, the service penetration is very high. The figure from OFTA indicated that there are 1.1 million pager users. The labour force is estimated as 3 million people. In other words, the service in the entire working population is more than 33%, i.e., there is one pager user in every 3 working people. With already such high service penetration, it is no wonder why the competition is so keen. The intense competition is also attributed to the fact that a large number (over 30 operators) of service providers exist in the marketplace.

With little variation on the service feature, the competition is more on price. During the growth stage of the market, customers may spend several hundred or over a thousand dollars to buy the pager. With keen competition, the price of the pager has been driven down. Now with minimal monthly charges; as low as \$10, customers can rent pagers. Companies also use inexpensive service monthly charges as their competitive edge.

The mobile phone market has no fewer problems as compared to the paging market. With the introduction of cellular digital technology, which has expanded the network capacity, the companies are in a hurry to lower their price. This is done to attract as many customers as possible, so as to make contributions to network fixed cost. This cost accounts for the major part of the total cost.

Similar to the paging market, there has been a drastic drop in the handset price. In addition, the companies also offer low usage packages to attract the later adopters, whose communication needs are not as strong as those of the early adopters. The price competition not only affects the industry itself, but also other products such as both pagers and CT2 service.

The low usage package has made the service cost similar to the paging service charge. With the handset price so low, the price differential between the paging service and mobile phone service has further narrowed. This attracts people who are willing to pay a little more but with the convenience to call any people freely. In fact, within just half a year, the pager service has declined from its peak of 1.4 million users (June 95) to 1.1 million users (January 96).

On the other hand, the price competition has quickly pushed the CT2 service into its decline stage. Because of the limitation of making calls only, CT2 service is usually used in conjunction with a pager. Thus the cost is actually the addition of two services. Therefore the lowering of mobile phone service has reduced the price difference between the two services. This accounts for the recent shift of the CT2 users who probably have upgraded to the mobile phone service. The service has given them extra convenience, i.e., no need to carry both a pager and the CT2 phone set, and additional mobility. Unfortunately, the competition has ultimately led to the closing down of CT2 service run by Chevalier Telepoint.

### Regulation

In Hong Kong, the industry is regulated by the government body known as the Office of the Telecommunications Authority (OFTA). The body formulates the regulatory framework in which the service providers operate. This includes the licensing issue, the spectrum frequency allocation and the technology to be adopted. Although the main concern of the organization is to maintain a positive non-intervention policy, OFTA sometimes acts as an arbitrator in regulating the conflicts among the service providers.

The regulatory environment of the telecommunication industry has an immediate implication for the intensity of competition, since it governs the number of players allowed in the market, and the technology that each service provider can use. The latter relates to the product substitutability for each other.

Any company which wants to provide telecommunication service in Hong Kong must first be granted the necessary license, which is issued by OFTA. The mobile phone service is licensed under the Public Mobile Radiotelephone Service (PMRS). The mobile phone service so far has been restricted to the issuance of four licenses only. Thus, the competition in the mobile phone service market is limited to these four companies.

Similarly, paging service is normally licensed under the Radio Paging System Licenses (RPSL), except for international paging services and radio paging services operated in conjunction with CT-2 services, which are licensed under the PRSL. Radio Paging System Licenses have been issued to over 30 operators in HK.

For the CT-2 service, it is also governed under the PMRS license and only four licenses have been issued. The table below is a summary of the licensees of each service.

TABLE 4  
SERVICE PROVIDERS OF VARIOUS WIRELESS SERVICES

Mobile Phone Service	CT-2 Service	Paging Service
Hong Kong Telecom CSL Ltd	Hong Kong Callpoint Ltd (a subsidiary of HK Telecom CSL, and recently has returned the license to the government )	over 30 operators
Hutchison Telephone Co. Ltd	Hutchison Paging Ltd	
Pacific Link Communications Ltd	Pacific TeleLink Ltd	
SmarTone Mobile Communications Ltd	Chevalier (Telepoint Ltd)	

Source: Office of the Telecommunications Authority

If one studies carefully the above table, one can see that a number of companies have been awarded with the licenses of various services. This includes HK Telecom CSL, Hutchison and Pacific Link, which all have the mobile phone and CT2 licenses. In fact, all these companies also have a license for paging service. It has been the consideration point by OFTA that a company which has already been running a number of telecommunications services can easily achieve economies of scale if it is to provide any new service. This somehow raises an interesting dilemma as to whether the



customer benefits from the economies of scale, or through introducing more competition.

With the technological improvement, OFTA by November 1994 decided to introduce the PCS and CAS services into Hong Kong and invited bid proposals, which are also governed under the PRSL. Such introduction set the development path of the future personal communication service industry. Regarding the regulation of the future mobile phone service, OFTA has already published a consultative paper and held a workshop in February and July of 1994, respectively. The main messages conveyed are as below:

- The introduction of the new technologies aims to provide more capacity for meeting the overall consumer demand, since the technology allows a new spectrum at higher frequency to be utilized.

However, such introduction has great implications for the existing mobile phone services. For example, the PCN service is able to provide a greater degree of functional flexibility than current mobile or fixed services, either in conjunction with those services or as a substitute for them. Similarly, the CAS also has the ability to receive calls, low speed mobility with call handoff between calls. Therefore the introduction of new services by the government could possibly bring in new substitutes to the existing services, thus increasing the competition in the industry.

In fact, OFTA does have the intention to introduce competition to the industry. Through introducing new services to the market, OFTA attempts to make this as an opportunity for allowing new entrants to join the industry.

- As stated in the consultative paper published in April 1994, the introduction of the new technologies aims to allow for licensing new entrants to

compete with the existing operators. OFTA intends to give not more than 4 CAS licenses and 6 PCS licenses.

While all the existing service providers can freely bid for the new license, OFTA stands firmly that the position of existing service providers, even the mobile phone operators, are by no means different from those of the other bidders.

Thus, the degree of competitiveness largely depends on whether newcomers or the existing mobile phone companies are awarded with the new licenses. If most of the licenses go to the new players, it means more companies are allowed to join the industry and the degree of competition is certainly increased. But if the licenses go to the existing companies, the competitiveness will be less intense. The possible product conflict can be resolved or managed more under the sole control of the company.

- There will be a convergence of fixed and mobile service in future.

As described in previous paragraphs, the market and technological developments do not provide sustainable ground for a distinction of fixed and mobile services. OFTA agrees with this view. But just with the recent introduction of competition in fixed telecommunications network service, the license for fixed and mobile services will continue for the next three years. Nevertheless, the new regulatory issues related to the technical matters, fair market practices and consumer protection will be framed with this convergence in mind.

In the bid for CAS license, four companies, namely, Hutchison Telecommunications, Hong Kong Telecom, New World Telephone & SmarTone have submitted proposals to OFTA as of July 1995. The award of the license is subject to the approval of both OFTA and the Sino-British Joint Liaison Group, since the license will last beyond 1997.

The above account has suggested that the regulatory environment provides the support for introducing the latest technologies and encourages competition. This is with the objective that the increasing consumer demand can be readily satisfied with more choices and lower price service can be provided. Such development has made the industry more dynamic and competitive than ever before.

## Technology

The telecommunications industry is continuously experiencing rapid growth as technological innovations are emerging at an unprecedented rate. However, there are a few major technological breakthroughs that have produced great impact for the industry.

### Technology Highlights

#### Frequency Modulation (FM) for radio transmission

The concept for mobile or wireless communications emerged a long time ago, back in the 1920s. This was the age of mobile radio, using amplitude modulation (AM) for radio transmission, and it was widely used for military purposes during World War II. However, the war brought forth an enormous stimulus for the development of radio-communication system. With the invention of frequency modulation (FM) for radio transmission, size, reliability, cost and performance were substantially improved. This technology breakthrough is the critical factor for the commercialization of mobile radio systems.

With FM, signals are transmitted across the air by varying the frequency of the radio wave, as opposed to varying the amplitude, or strength, of the radio signal (AM). The FM technology has resolved the very crucial propagation problem inherent with

AM, with use of much less power. Today, the mobile phone technologies are still using FM transmission that was developed since the 1930s, though there have been many improvements on the network components.

With FM technology, voice or data is transmitted through pre-assigned blocks of radio frequencies (measured in Hertz, Hz), namely, the data channels. Size of the data channel is called its bandwidth, which is measured by the number of frequencies required in forming one data channel. The whole band of radio frequency is called the spectrum. Since there are absolute physical limits on the radio spectrum, this has been one of the major restraints that has created capacity limitation for the radio transmission networks.

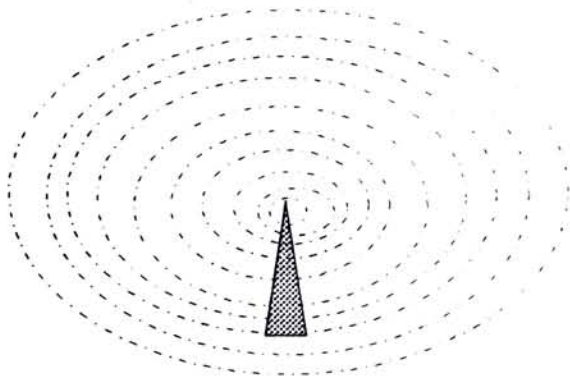
### Cellular systems

Another critical innovation for the development of the mobile phone is the concept of “cellular architecture.” Essentially, this is a system concept for structuring the radio-telephone network, rather than anything to do with the radio technology. However, the beauty of this approach is that, without any fundamental technological advancement, it has provided virtually unlimited system capacity, which has been the major limiting factor for the growth of the mobile telephone industry before.

Traditionally, mobile communications is developed along the broadcasting approach: set up a high-power transmitter for blasting out signals to the surrounding areas. This method can provide fair to adequate coverage of 40 to 50 miles. Unfortunately, for a transmitter, only a fixed range of radio frequencies can be transmitted, thus providing very few channels within the coverage area.

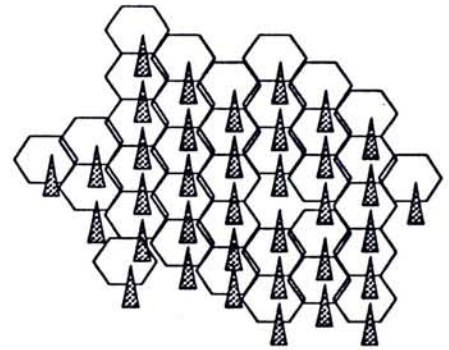
The cellular architecture has abandoned this broadcasting approach, but instead used low-power transmitters, each of which was designed to cover only a small hexagonal area a couple of miles across. In order to provide coverage for a large area, a large number of these low-power transmitters are built to provide blanket coverage. Thus, each small area covered by one of these low-power transmitters is called a “cell”. With the increased number of transmitters for the same area of coverage, the total number of channels available is also improved; thus, total capacity for the mobile telephone network can be very much improved by applying the cellular design.

This is illustrated in the following diagram:



#### Broadcasting Approach

A single high-power transmitter covering the entire area



#### Cellular Approach

A large no. of low-power transmitters, forming cells, to blanket the entire area.

Each of the above-mentioned transmitters has to be tuned to transmit only the signals within a certain range of the frequency spectrum. Within the coverage area, the range of frequencies at which the transmitter is operated must be cleared, such that

they are used exclusively by the transmitter to transmit voice or data. Otherwise, the transmitter may wrongly transmit unwanted signals, or noise, resulting in degradation of voice or data quality. This is called interference.

At the boundaries of the cells, the frequency spectrum used by all adjacent cells would be present. Thus, in order to avoid interference, frequencies used in cells in physical proximity should not overlap. On the other hand, if the cells are sufficiently far apart, the possibility of interference would be non-existent, and therefore the same frequency range can be used in these cells. This is the concept of "frequency re-use". As mentioned in the FM section above, capacity limitation for mobile telephones is also caused by the limited radio frequency spectrum. With cellular technology and the application of frequency re-use, the problem of encountering network capacity saturation can be greatly alleviated by careful network planning and design. This is the beauty of the cellular architecture applied in mobile telecommunications systems.

Another related concept is called cell-splitting. Since the number of communication channels provided by each cell is fixed, to increase the channel capacity of a fixed area, more cells must be built into the same area. This can be done by subdividing the original cell into smaller cells, with even lower transmitter powers. By cell-splitting, more traffic can be allocated in congested areas, and frequencies can be re-used at even shorter distances.

In conclusion, the smaller the coverage area of each cell, the lower the transmitter power. Within the same size area, the more cells allocated, the higher the channel capacity for housing the high traffic and the greater the chances for frequency re-use, which also means a better utilization of the limited radio frequency spectrum.

Significance of the cellular design to mobile telephone system can be realized from the interchangeable use of “cellular phone” and “mobile phone”.

### Digital vs. analog

Another breakthrough technology is digital communications. During the age of analog communications, signals transmitted are complex, continuous electrical waveforms. However, with the development of digital communications, the signal is replaced by simple discrete streams of 1s (pulses) and 0s (spaces), or on(s) and off(s). Digital communication is more reliable and effective for data transfer, and thus it is being widely used in both computer and telecommunications industries.

### Multi-access methods

The way that the radio frequencies are actually sent across the transmitter and the receiver, that is, the base station and the handset in mobile telephony terms, has also undergone critical breakthroughs with multi-access methods.

The most commonly used method for radio transmission by far is called the frequency division multiple access (FDMA), which allows the base station (transmitter) to transmit the frequency channels to multiple handsets (receivers) at one time by multiplexing these groups of frequencies. However, the frequency channels used for communication between the base station and the handset must be assigned for exclusive use throughout the conversation.

The next most common one is called time division multiple access (TDMA). This technology allows the base station (transmitter) to divide and transmit the groups



of frequency channels for multiple handsets (receivers) sequentially (one at a time). This means that the same group of frequency channels can be used simultaneously by multiple handsets for communications, with each handset sharing the bandwidth at different time slots in turns. TDMA can better utilize the bandwidth for transmission of radio frequencies, and thus should be gaining its way in the future.

The latest technology, called Code division multiple access (CDMA) is relatively new and has not yet widely been accepted or implemented. With CDMA, all stations transmit on the same frequency simultaneously. However, each transmission has its own code that must be decoded by the destined receiver. Interference problems would not happen even if the frequencies are not used exclusively, as the interfering frequency signals would be ignored by the receiver. The CDMA technology is proven to be more reliable and efficient. However, it is also very expensive, due to the complexities of the equipment.

### Mobile Phone Technologies

The most popular mobile technology in the existing market is the cellular mobile phone systems, including analog systems (AMPS, E-TACS and TACS) and digital systems (USDC and GSM). In the near future, new products will be introduced, the two most popular ones being PCS and CAS, both using the micro- and pico-cell technology. Depending upon how the market players position these new products, they could emerge to either become substitutes for, or complimentary to, the existing products.

## Cellular phone technology

Cellular communications were designed in 1974, using the 800-900 MHz portion of the ultra high frequency (UHF) band. The average cell is 3-5 miles across, but 2-10 miles at the extreme, and the power output can be 0.6 to 3 watts for the mobile phones. Each cellular phone has a unique identity, namely, the numeric assignment module (NAM). Whenever the phone is turned on, a check is sent across the control channel signifying its location to the mobile telephone switching office (MTSO), such that the MTSO can direct any incoming calls to the proper base station for retransmission to the mobile phone. Similarly, when the mobile phone is moving from one cell to another, the system must also be updated for its location. While the handset is turned on, it would be set to an idle state which continuously scans and listens to the data channel for any incoming calls or control information from the MTSO.

To make outgoing calls, the mobile phone set must send a request to the base station before the call be set up. If there is an access channel available, the base station would continue with the call setup and establish a connection for the mobile phone set.

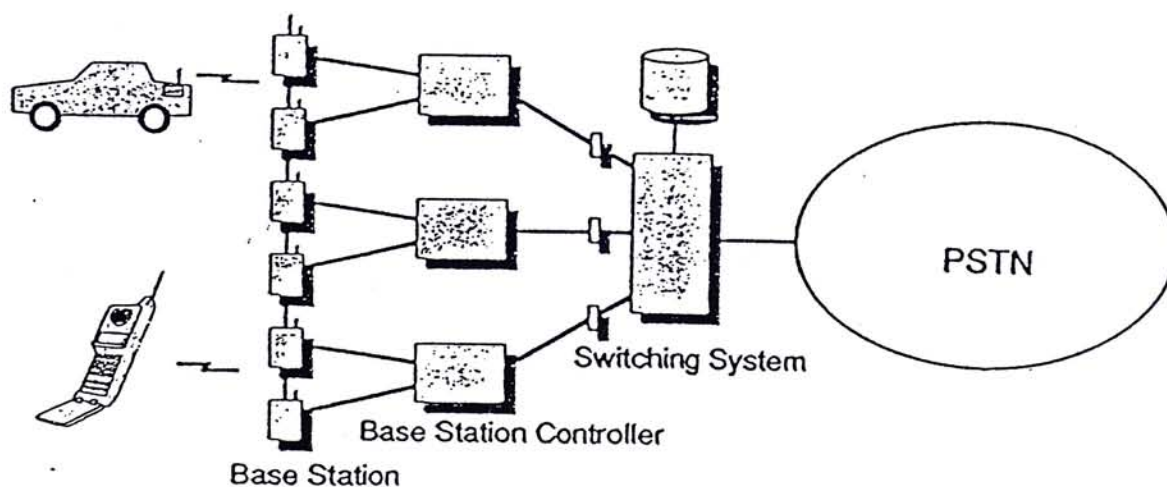
Whenever there is an incoming call, the system would broadcast the message through a paging channel for locating the target phone set. When the handset receives the page, it responds to the system and the system would then instruct the handset to use a particular channel for receiving the call and establishes the connection.

When the handset is moved from one cell to another while a call is in progress, communication between the original base station and the handset must be dropped and passed on to the next base station. The ability of having a smooth transition across cells without having the call dropped is called handoff. The handset would switch to

talk with the next station when the signal from the original station becomes very weak, while that from the next station becomes strong enough. During the transition, the original cell station would negotiate with the next cell station for allocating an accessible channel for the coming call handoff to the next station, just like when a new incoming call is received. Thus in order to provide smooth handoff, it is necessary to have the handset able to communicate with both stations at the cell boundary, that is, overlapping coverage. The present technology also supports calls at high speeds inside a moving vehicle.

Another cellular phone feature is called international roaming. This is the ability of routing calls from overseas. Availability of this feature depends upon whether the cellular service provider has entered into an agreement for international roaming with the overseas operators.

The network architecture for a typical cellular phone system is shown in the following diagram:



### CT-2 technology

As its name implies, CT-2 is basically a cordless phone service whereby people can, instead of using the fixed-wire telephone on the street, use their own CT-2 handset connecting to the public switching telephone network. CT-2 does not have separate switching control, but the base stations connect directly to the switch box of the PSTN, with very low mobility (stop or slow walking pace) and no handoff. The original CT-2 also allows for incoming calls only, such that the network does not need to identify and locate each handset on the network all the time. However, later enhancement has provided for limited 2-way calling service.

### Major technology pitfalls

The major pitfalls in the mobile phone market identified so far are:

- high up-front costs for carriers
- high per-minute charge for users
- expensive equipment
- users' attitude towards the mobile communications services and the new concept of charging for usage
- risk of fraudulent use of the cellular user's account
- theft of airtime, handsets and information

## Future Technology Development

### Convergence of fixed and mobile telecommunication network services

Though they are regarded as two separate streams of the telecommunication network services today, eventually, there should be little or no distinction between the two in the future from the customers' point of view. This is the ideal stage of personal communications services, when people can communicate anytime, anywhere. Thus, regardless of where people are staying, they can be reached by the same piece of equipment, such as a mobile phone handset. The network should be intelligent enough to determine the best communication means for reaching the person, based on his/her location, existing network traffic and communication costs, rather than having the user decide whether to use the house phone or mobile phone. However, development into this futuristic stage would be very much dependent on the development of seamless integration of the various fixed and mobile telecommunications networks.

### Convergence of data and voice transfer

With the advancement of information technology and growth of the computer network, use of computer and data communication is no more restricted to business, academic and government bodies, but rather needed for day-to-day use by the mass population. People may need to connect to the information superhighway, such as the Internet or any other popular public networks, anywhere and anytime. People may also need to connect themselves to the private networks of banks, brokers, or even supermarkets for all kinds of transactions. Thus, telecommunication network services

are no longer limited to voice communications, but rather assume the form of telephony, data, paging, and email applications to the mass market.

### Personal communications

With the above ideas in mind, the cellular phone industry is tending towards the concept for personal communications. This new service is geared towards the mass public, such that individual telephone users are not being tied to a pair of wires or to a fixed location with an associated number. On the contrary, each individual is assigned a universal identifier through which the intelligent telephone network can locate him/her regardless of where the recipient of the call is and at any time, simply by carrying an integrated handheld equipment which can be used for all sorts of communications.

### Increasing demand for more and better services

With the rapid economic growth in Hong Kong and the Asia-Pacific region, especially expansion in the service / financial sectors, it is anticipated that there would be an increasing demand for more and better telecommunications services by both businesses and consumers. With the present rate of growth for mobile telecommunications services, it would not be long before mobile phones become consumer products. Moreover, with increasing activities performed through telecommunications network services, all the quality issues such as high availability, reliability, security and so on would be increasingly demanded.

Summing up for the above macroenvironmental analysis, we see that with the fast-growing economy and the socio-cultural development, there would be extremely high market potential for mobile telecommunications products. Moreover, with the dynamic nature of technology-based industries, new market opportunities will continuously emerge. Thus, there should be very good market prospects if the right market opportunity could be captured. However, with the recent move of the government or regulatory body to liberalize the industry, competition is expected to be intense for the market players attempting to explore and share in the expected huge profit potential.

## CHAPTER III

### PRODUCT ANALYSIS

#### Product Definition

“Cordless Access Services” (CAS) are low mobility, cordless services which primarily provide public services for access to fixed telecommunications networks. Technologies delivering CAS include Personal Handy-phone System (PHS), Digital European Cordless Telecommunications (DECT) and Personal Access Communications System (PACS). The three technologies are developed by Japan, European countries and the U.S., respectively. The key features for CAS include: high network capacity, smaller handset and longer battery life, single personal telecommunication number used at multiple environments, such as cordless, telepoint and cellular.

Mobile telecommunications services utilize the radio frequency channels for communications. The whole range of radio frequencies is called the spectrum. It is thus important to reserve specific radio frequency spectra to the specific mobile telecommunications services for assigning to the telecommunications services operators such as to avoid interference. OFTA has already reserved spectra in the 1883 - 1895 / 1906.1 - 1918.1 MHz bands for CAS licenses. Spectra 1895 - 1906.1 MHz band and/or the 1850 - 1880 / 1930 - 1960 MHz bands can also be made available for expansion after December 1997.



Product Comparisons

TABLE 5

A COMPARISON OF VARIOUS WIRELESS COMMUNICATION  
TECHNOLOGIES

	Digital Cellular		Digital Cordless			
Standards	GSM	PCN (DCS1800)	CT2	DECT	PHS	PACS
Origin	Europe	Europe	Europe	Europe	Japan	US
Spectrum	890-915 935-960	1710-1785 1805-1880	864-868	1880- 1900	1895- 1918	1850- 1910
Spectrum capacity (channel/MHz)	40	40	10	6	13.4	12.8
Cell size (km)	1-16	0.5-8	0.1	0.5	0.5	0.5
Mobility (km/hr)	250	130	6	6	6	6
Handset transmission power (mW)	125	125	5	10	10	25
Handset weight	light	light	light	light		
Handset battery life	depends	depends	long	long		
Handset price	higher	low	low	low		
Communications	2-way	2-way	1-way	2-way		

### Product Strengths

CAS has some advantages over both the existing CT2 and digital mobile phone services.

#### Two-way Accessibility

CAS can both initiate and receive calls. At home, it can be used as a cordless phone and connect to the PSTN through the home base station. While going out, the same handset can be carried around and get connected through the public base stations. In the office, again the same handset can be connected through the wireless PBX. Thus, people can have a unique number to be reached at home, on the street, or in the office.

#### Supports Some Mobility

CAS supports limited mobility with seamless handoff capability. Thus, people can make calls and talk while walking on the street. Also, when they walk through areas that are covered by different base stations while communicating, the original base stations can automatically put forward the call to the next stations to allow people to continue with their calls, with the transitions that are totally transparent to the people using the service. This handoff capability is not found in the existing CT-2 service, and the quality is unmatched even by the existing GSM technology.

### Provide Higher Service Availability

The existing mobile cellular is using the comparatively low frequency spectrum, at 800/900 MHz range, which will be used up soon. The new CAS will operate at the more available high frequency spectrum, at 1.7/1.9 GHz, though details are to be assigned by OFTA. Together with the use of TDMA for radio transmission, the frequency spectrum can be utilized more efficiently to further enhance the network capacity unmatched by the cellular phones.

Moreover, as the coverage area for each base station of the CAS is very small, with a maximum radius of 1.5km, the same frequency can be re-used at smaller distances without interference, enabling the higher utilization of the frequency spectrum.

Again, because of the small coverage, more base stations could be installed. This would provide more channels within the same size area (as compared to technologies with wider coverage area, such as GSM), as the number of channels supplied by each base station is fixed. Thus, CAS is especially good for providing mobile phone service in congested urban areas.

### Clearer Voice Quality

Voice quality of the existing mobile cellular phone is not so good, most of the time being jammed with noise and interference. However, the voice quality from CAS is very much improved. Talking through the CAS is nearly indistinguishable from talking through the fixed-wire telephone at home or in the office.

### Allows for a Handy Phone Handset

A very handy, lightweight handset is possible, something around 170cc in volume, weighing 200g.

### Low Power Consumption for Handsets

Again, because of the small coverage area for each base station, the power necessary for transmitting data between the base station and handset is low. This does not only minimize any noise or interference during data transmission which can enhance the voice quality as mentioned before, but also lengthens battery life for the handsets (estimated to last for 5 hours' call time and 150 hours' wait time).

### Relatively Low Infrastructure Investment

As compared to cellular phones, initial infrastructure investment should be a bit lower. This is because operators can make use of the public low-cost network available, rather than having to build the complicated high-cost network as for the GSM.

### Ease of Installation

Size of base stations is small, 210mm x 298mm x 75 mm, 4.7 litre in volume and weighing 2.8 kg. With such size and weight, installation work would be easy and

conveniently placed anywhere, such as on the telephone pole, street lamp, wall face of buildings, ceilings or lobby, rather than the high antenna required for the cellular phone. As compared to fixed-wire telephone, there will also be reduced wiring, especially at the office building where demand for telecommunication / broadcasting equipment is very high, with frequent occupant turnover and office layout rearrangement.

#### Integration with Paging Service / Messaging Service

Short message display that is available for most pagers is also available for the CAS, with bigger screen and thus better quality for display.

#### Better Security

By employing the TDMA technology for radio transmission, it makes it very difficult to eavesdrop or steal usage of the air time for the CAS, as compared to the cellular phones using FDMA.

### Product Weaknesses

#### Smaller Network Coverage

Due to the small coverage area of each base station, a lot of base stations have to be installed in order to provide full territory wide service coverage. This is especially not cost-effective in the sparsely populated rural area. Numerous base stations have to be installed in order to provide continuous coverage, while utilization of each base station could be extremely low. Moreover, in some hardly accessible areas, such as on the country trails, both installation and maintenance for the base stations would be very expensive, if not impossible.

#### High Running Cost

Again, because of the small coverage area of each base station, a larger number of base stations has to be installed in order to provide service for the same area. This does not only require more equipment, but also cost for leasing an area for installing the base station. This is a recurring cost and especially significant in Hong Kong where land is very expensive.

### Only Low Mobility

CAS supports only limited mobility as compared to the cellular phone, which allows people to make calls at high speeds such as in moving vehicles.

### Confidence Problem Towards New Technology

The development of the digital cellular technology is in a maturity stage. There are already 70,000 mobile phone customers in the Hong Kong market. With the recent price competition in the mobile phone market, the product is becoming more affordable to the general public. There is the inherent difficulty in selling this new service with an unproven track record and lack of reference. And yet the service provider has to offer a low price, in order to compete with the mobile phone service and attract the customer for service trial.

## Product Opportunities

### Compete with Mobile Phones and CT-2

CAS can be seen as providing a kind of service in between fixed-wire telephones and cellular mobile phones, similar to the CT-2. It is, however, better than a CT-2 with 2-way communications and more talk channels available (not restricted by number of actual wired PSTN channels), and can support limited mobility with handoff capability. Although the service may mean limited network coverage and low mobility when compared with the mobile phone, its possible low price, smaller handset and longer battery life expectancy can help to attract some price and value conscious customers.

### Compete as Secondary Fixed-wire Phones, with Enhanced Mobility

We would introduce a new concept of telephone service for people: from wired to wireless, from location oriented to personal usage. Thus, instead of installing a wireline telephone at home or in the office, we persuade people to buy CAS, which serves as an additional telephone line at home with not only indoor mobility but outdoor mobility as well.



## Product Threats

### Price War in the Cellular Market

A price war in the cellular market has just broken out. The price of a cellular handset has dropped over 100% within one or two months' time. The situation could be attributed to the operators' intention to attract more customers by lowering the initial service cost, and hence the subscriber base will be expanded. There are two reasons for this. First, it is projected that there is still much room for market expansion. All the operators would like to take advantage of this market opportunity and maximize their market share. Second, for all of the existing operators, there is still spare network capacity available. Not until the network reaches its full capacity will additional utilization of the network bring in revenue without incurring much fixed cost. As long as the recurring cost, which is a smaller portion of the total cost, can be covered, the service operators are willing to lower the price so that there will still be a contribution to the fixed cost.

With lower price for cellular phones, CAS would easily lose its competitive edge as a lower-end product.

### High Rental Costs for Installation of Base Stations

Hong Kong is famous for its high cost of land. Since CAS requires a lot more base stations to be installed as compared to cellular phone systems for the same area of

coverage, rental costs for placing the base stations would represent a very significant part of the running costs for CAS. Furthermore, with increasing competition from the industry players, demand for housing these base stations would definitely increase, causing the rental charges to rise further.

### Availability of Network Infrastructure

All the base stations must be connected, through wired networks, for exchange of data. The network requirement for connecting the CAS base stations, featured by the level of quality for data transmission, is not currently available from the only fixed-wire network provider, Hong Kong Telecom, though it is technically feasible. There is, thus, a potential that a higher than reasonable price would be charged for the network service required.

In total, the CAS is a great leap forward of the CT-2 technology. It provides very good network qualities comparable to those offered by fixed-wire telephones: clear voice quality, serving both incoming and outgoing connections, good handoff quality (such that there would be no interruption when people using the CAS are moving around within the tolerable speed limit of the service, and the remote party would not notice the movement). More importantly, use of the CAS can better protect the conversation over the phone being tapped by a third party, which can be quite easily done on the existing fixed-wire telephones.

When compared to the cellular phones, however, CAS has some inferior network qualities: smaller coverage (cannot be used anywhere in the territory) and lower mobility (cannot be used in moving vehicles). However, CAS can provide very

high network capacity that cannot be provided by cellular phones. When the ever-increasing demand for mobile telecommunications has grown to a level that is unmatched by the existing cellular phones, especially in the congested urban areas, CAS could definitely offload a lot of the network demand from the cellular phones.

## CHAPTER IV

### COMPANY ANALYSIS ABOUT HUTCHISON TELECOMMUNICATIONS (HK) LTD: A SWOT ANALYSIS

To capitalize on the market opportunity brought by CAS, Hutchison Telecommunications does have a number of competitive advantages to be successful. But this does not mean that the marketing war is an easy one. The company has its own limitations and competition is anticipated to be more keen than ever before. Below is a SWOT analysis of the company.

#### Strengths

##### Marketing and Technical Expertise in Wireless Telecommunications Services

As mentioned before, Hutchison Telecommunications (HK) is one of the business units of Hutchison Whampoa Ltd. Before the merger in January 1996 forming Hutchison Telecommunications (HK) Ltd, there was the Hutchison Telephone Co. Ltd, Hutchison Paging Co. Ltd and Hutchison Communications. Hutchison Telephone is responsible for the mobile phone services, while Hutchison Paging carries both the paging and CT2 services. All of these businesses have helped the company to build up its expertise in wireless service. Hutchison Communications is the fixed network service provider with its first service working on international telephone.

TABLE 6

A TIME TABLE ON THE LAUNCH OF VARIOUS WIRELESS SERVICES  
BY HUTCHISON TELECOMMUNICATIONS

Year started	Service
1984	Cellular mobile service
1986	Paging service
1992	CT2

Source: Hutchison Telecommunications

With the introduction of cellular mobile phone technology, the company has quickly grasped this opportunity by being the first provider of the mobile analogue service. The company has also successfully launched the product as a premium service to the market. It was at that time that the company acquired the image of providing good quality and professional service. The customers it served are mainly those top managers of big companies whose requirements are demanding.

The group continued to expand its presence in the wireless telecommunications market by running the paging business. The company has experienced a rapid growth within a short period of time by acquiring a number of small operators. The acquisition of the different companies has helped greatly increase the paging network coverage and also has built up an extensive retail outlet for selling the service. These were the important factors accounting for the success of the company in the industry, and it has been the market leader for a number of successive years.

Similarly, the company is also the foremost marketer of the CT2 service which was started in 1992. The successful launch of the product in the Hong Kong market

has been a surprise to many of the foreign telecommunications companies, since the product has suffered from one major limitation of being unable to receive calls. However, the company has cleverly targeted this service to the youth sector whose concern is more on price. After the target segment was identified, the company was able to solicit over 95,000 subscribers by 1994 and this has accounted for 55% of the market share.

The company's experience is not limited to the local market but also to the overseas market. One example particularly worth mentioning is the introduction of the latest technology PCN in UK. The network named "Orange" has been able to recruit more than 130,000 subscribers. In addition, the group has also offered cellular and paging services in Germany, France, Thailand and Malaysia.

In terms of the number of services provided and the time period of offering them, no other company is comparable to Hutchison Telecommunications in the wireless market. Such valuable experience in both the technology and marketing side is certainly helpful to the company in picking up and marketing the CAS technology.

#### Strong Financial Background

While technical and marketing expertise are important assets to the company in supporting the new service, the financial support is no less important. The company gets strong financial backup from its headquarters at Hutchison Whampoa Ltd. As of December 1994, the shareholders' funds of Hutchison Whampoa Ltd was HK\$57,157 million. The group is one of the biggest hongks in HK and the constituent stock of the Hang Seng Index. Such strong financial support has allowed Hutchison

Telecommunications (HK) to make handsome investments on improving the technology which in turn helps to build the competitive advantage by providing quality service. An example is the investment amount to be afforded by each mobile phone company within this year to improve its network.

TABLE 7

## INVESTMENT AMOUNT BY THE MOBILE PHONE COMPANIES

Company Name	Investment Amount (HK\$)
Hutchison Telecom	7 billion
HK Telecom CSL	6 billion
Pacific Link	5 billion
SmarTone	4.8 billion

Source: Sing Pao Daily News, 25 March 1996

## Ride on Existing Corporate Infrastructure

The CAS service can leverage on the existing paging and cellular service. These benefits can be seen in the discussion below, and are the competitive advantages of the service.

Wide Distribution Network

Out of all the potential CAS providers, Hutchison Telecommunications has the widest self-administered retail networks, taking all paging and mobile telephone shops into account. The company in total has over 50 retail outlets. The network can flexibly

be expanded if taking other sister's retail outlets into account. These may include Fortress, Watson's and Park'N Shop. The table below lists the number of outlets included under each chain store.

TABLE 8

## NO. OF RETAIL OUTLETS OWNED BY HUTCHISON WHAMPOA LTD

Chain Store	No. of Outlets
Hutchison Telephone	6
Hutchison Paging	45
Fortress	36
Watson's	70
Park'N Shop	163
Total	320

Source: Hutchison Whampoa Ltd

These chain stores can help to sell the product or to disseminate the product information. For example, Fortress has also been included as the retail outlet for selling the mobile phone services. The impact on creating market awareness can be magnificent as well since these channels reach the mass market. Watson's has been the convenience store for the young working population, while Park'N Shop has been the marketplace for the housewives. All these people can be potential customers of the CAS.

The competitors can find other companies for alliances to sell these services. As the two still belong to different companies, conflicts are unlikely to be avoided. Increased time on management for achieving better coordination is necessary. But the



most major limitation is the difficulty to standardize the level of customer service provided. The table below summarizes the retail outlets of the potential CAS providers.

TABLE 9

## NO. OF RETAIL OUTLETS OWNED BY POTENTIAL CAS PROVIDERS

Company Name	No. of company owned outlets			Dealers
	HK	Kowloon	NT	
Hutchison Telecom	12	23	16	269 <sup>(1)</sup>
HK Telecom CSL	10	13	8	13
SmarTone	1	1	1	73

Source: Tin Tin Daily News, 20 March 1996

<sup>(1)</sup> - This refers to Fortress, Watson's and Park'N Shop

### Good Company Image

Hutchison has built up a good track record in the paging and cellular mobile phone service. In the paging market, Hutchison is a market leader, taking 38 % of the market share. Compared with the second largest player, Star Paging, which has a market share of 13%, the company takes a lengthy lead.

A leading position has once been assumed in the cellular market. According to the market research department of Goldman Sachs, Hutchison has taken the largest market share of 42.1 % in the analogue mobile phone market. Owing to its slow adoption of the cellular digital technology, the company presently has the lowest market share of only 5% in the digital mobile phone market. Despite this rather

unsatisfactory market performance, the company image still ranks just behind HKTCSL in the company's self-initiated research. It can be deduced that customers still have a very good impression of Hutchison Telecom. Needless to say, the company's goodwill helps the CAS to be more readily accepted by the market than the competitors.

### Strong Customer Service Support

Being the biggest paging operator and mobile phone service operator, the company has a strong customer servicing team, which has been well-trained for supporting similar service. The CAS can reap this benefit by providing professional customer service support. In addition, the wide distribution network makes the service more conveniently available to the customer.

### Comprehensive Product Range

As mentioned earlier, the company is one of the few companies which offers paging, CT2 and mobile phone service. For other potential CAS competitors, only HKTCSL has both paging and mobile phone service. For New World and SmarTone, they just offer either paging or mobile service. Hutchison may have advantages in two aspects:

1. The flexibility in product bundling. This helps to provide a total solution for customers.

2. Larger customer base which helps CAS to achieve greater market share, if there is an opportunity for the existing customers to upgrade or migrate to this new service. The industry foresees that the CT2 users will easily be attracted to the mobile service or new services such as PCS or CAS, since they can provide better value for money. Similarly, the pager users may also have the intention to move to the new service, which can provide the convenience of calling others freely.

TABLE 10

NO. OF HUTCHISON TELECOM CUSTOMERS IN CT2 AND PAGING SERVICE

Service	Hutchison Customers
CT2	95,000
Paging	412,000

Source: Hutchison Telecom

## Weaknesses

### Little Product Innovation

The past success of the company has been attributed to the good network performance. But with the increased competition and more sophisticated customer demand, introducing new service features is important. Hutchison has been well known for its reliable service but not its service innovativeness. For example, the secretarial paging service, which is now a major service item, was not initially introduced by the company. Similarly, the company has been slow in introducing cellular digital technology. This has seriously threatened the company's market leading position in the mobile market.

### Integration of Different Businesses Units

As introduced earlier, the mobile and paging businesses were run separately by different subsidiaries. However, from the viewpoint of market development and internal efficiency, there has been the urge for the separate business entities to merge together to achieve the synergistic effect described above. Although the company has already taken the first step of putting the three subsidiaries (i.e., Hutchison Telephone, Hutchison Paging and Hutchison Communications) together structurally, the real integration of different people which have long adhered to past practices needs great effort to manage. The merger has just started in January 1996; strong management is

required to help the staff adapt to the new working environment and learn new things. If such process is not managed well, the staff will be working in a confused and frustrating environment, and poor service will be the result.

#### Lack of Fixed Network Infrastructure

The provision of CAS requires also the radio stations to connect physically to the fixed network switch. Although Hutchison has bought its own fixed network switch, it does not have the infrastructure for line connection between the radio stations and its switch. For such setup, it still has to rely on Hong Kong Telecom for providing the fixed lines. The undesirable impact is that the leasing of the lines directly increases the running cost of the service. In addition, the aggressiveness of the company in expanding its network coverage is somehow hindered because of the competitive relationship, even though Hutchison is a customer of HK Telecom.

## Opportunities

### Economies of Scale

The introduction of CAS to Hutchison Telecom can be seen as an additional product item to its existing product family. The new service can further result in economies of scale in sales and marketing, customer service and distribution channel, as discussed above.

Apart from the above, the service brings an important value to the fixed network service recently developed by the company. In 1995, one of its previous subsidiaries, Hutchison Communications, was awarded with the license for running the second Public Switched Telephone Network. The company has already invested \$35 million on building its intelligent network switch for providing international telephone services and other value added services such as Personal Number. The CAS actually provides the cordless service for accessing the fixed network services. Thus the development of CAS can be seen as providing another source for generating revenue in order to contribute to the investment cost of the fixed network switch.

### Preserve its Position in the Market

The introduction of both the PCS and CAS services bring strategic implications to the industry. The new services affect the market in two ways:

- attract new customers

- draw existing customers moving to these new services

The macro-environmental analysis has shown that there is still ample room for the personal communication service, so the introduction of CAS service will help to attract some customers with its own competitive edge. If Hutchison Telecom only stays with its existing products, the potential customers will be drawn by other new services. Without increasing its customer base as the market expands, this actually means its leading position will be diminished.

Retaining existing customers plays an equally important role in maintaining the company's market position. With the recent price competition of the mobile phone service which results in even better value for money for the customers, this has drawn the existing paging and CT2 customers to the service. As revealed by the statistics provided OFTA, there has been an increase in the number of pager users for a number of years. But since July 1995, there has been a drop in pager users from 1.4 million to 1.2 million within a month. And the figure reached the lowest point in January 1996 of 1.1 million. This tends to suggest that the pager users have migrated to other services.

Similarly, the CT2 users represent a segment ready for migration to more premium service. In fact, Chevalier (Telepoint) Ltd was the first CT2 company which announced that it would stop offering the CT2 service. It worked with SmarTone for a privileged program in which their CT2 users can choose to change over to mobile phone service. Both Hutchison and Pacific Link have migration programs in place for their CT2 users to change to mobile phone service; this, however, may not be an effective way for retaining those customers who were originally more price conscious. If a new service such as CAS is provided, which can give better value for money, the

customer may be drawn away. Therefore the introduction of CAS gives the company another marketing tool for retaining its existing customers.



## Threats

### Price Competition From Mobile Phone Market

In terms of product functionality , mobile phone service can support higher mobility and wider network coverage, with better service level than CAS. One of the major selling points of CAS is thus its relatively low price. But with the recent price reduction program of mobile phone service, the competitive edge of CAS is somehow diminished.

### Competition from PCN

Competition also comes from PCN service. Similar to the existing Digital GSM service, PCN tends to support higher mobility and yet it also has a cost advantage over the existing digital cellular service. Therefore the target segment for PCN and CAS can be very similar. Unless the company can find specific market niches for the services, it is unlikely that the service launch will be successful.

### A Number of Competitors in the Market

OFTA' s intention is to issue no more than four licenses for CAS. But as discussed above, the competition does not come purely from the companies in its own product class. For PCN service, no more than six licenses will be issued. Together with

the existing four mobile phone service providers, there will be altogether 14 companies at most providing services with fairly close substitutability.

In short, Hutchison Telecom has advantages in its company name, marketing skills, customer service and distribution channels in the wireless service market. But with the market getting more competitive than ever before, the company has to utilize its own strengths for building the product's competitive advantages.

## CHAPTER V

### MARKET SURVEY

In order to devise a good marketing strategy for Hutchison Telecom, aside from the information of the above analysis, we need to have a better understanding of our customers. However, this is the weakest area of information that is available from secondary sources. Therefore, a market survey is conducted.

#### Market Survey Objective

The objectives of the market survey are as follows:

- To identify people's general attitude towards the concept of personal communications services
- To identify the target market for CAS
- To find out the right marketing appeals for the target market identified

## Methodology

### The Target Population

In the survey, the mass market for mobile telecommunication services is targeted. However, the need for telecommunications only increases with the amount of social activities required for the individuals, who mainly fall in the age group of 15 to 44. We thus define the target population of this market survey to be the general public, aged between 15 to 44.

### Data Collection

#### Sampling method and sample size

Convenience sampling technique was employed, since this is the most efficient method for conducting a market survey to the general public with limited resources for this project. However, to minimize the possibility of introducing sample elements on certain control characteristics, we have set quotas for handpicking the sample elements. As the target population of the survey is the general public aged between 15 to 44, the target distribution corresponds to the population distribution by sex and by age group as of the 1991 Population Census Report. This survey aims to collect information from 100 candidates. The following table shows the target distribution for the survey:

TABLE 11  
TARGET SAMPLE DISTRIBUTION BY SEX AND AGE

Age Group	Female	Male
15-19	7	7
20-24	8	8
25-29	10	10
30-34	10	10
35-39	8	8
40-44	7	7
Total	50	50

### Questionnaire distribution

The questionnaires are distributed to colleagues, friends, relatives, and their acquaintances, so as to include people with different occupations and working in different industries.

### Questionnaire Design

The market survey is a descriptive one based on a structured questionnaire with close-ended questions. The questionnaire is divided into two parts: part one collects information concerning people's general attitude towards mobile phone service, their expectations for the different attributes related to the mobile phone services, as well as their own estimations of usage; part two aims to obtain demographic information about the respondents.

There are a total of twenty-seven (27) questions, as detailed below :

- First two questions categorize the candidates by whether they are existing users of personal communications services, and if so, which type of services they are using.
- Questions 3 & 4 address the non-mobile phone users' attitudes towards mobile phone service.
- Questions 5 & 6 ask whether selling CAS as an alternative and value added service to fixed line telephone at home can be appealing to the customers.
- Questions 7 to 10 address the product appeals to the customers.
- Questions 11 to 17 collect information for formulating the pricing strategy
- Question 18 collects information for formulating the market promotion strategy
- Question 19 collects information for formulating the distribution strategy
- Questions 20 to 27 collect demographic information for identifying the target market

A sample questionnaire is attached in Appendix 1.

### Data Analysis

For questions 7 to 17, different dimensions of consideration for selecting the mobile telecommunications services are listed, and respondents are requested to rank the importance of these dimensions. The ranking is based on a decreasing rank with increasing value of the response. An overall average ranking is calculated by summing

the ranking of each of the attributes, divided by the number of valid responses. Below is the formula used for calculating the overall rankings:

$$\frac{\sum_{i=1}^{i=4} (\text{no. of response for rank } i \times \text{value of rank } i)}{\text{total no. of respondents}}$$

Questions 8 and 9 listed the most common attributes that people may consider while selecting mobile telecommunications services. Respondents are requested to rate the importance of these attributes.

There are altogether eight dimensions of demographics measured in the questionnaire, namely, age, sex, occupation, industry, personal income, family size, household income and education level. These demographic attributes would be used for analysis purpose. By cross tabulating with the ranking / rating of the above mentioned dimensions / attributes, we would like to see if any of the demographic variables would have some causal effects. Thus, these variables may be used for identifying the target market for CAS. Besides, these demographics are used for analyzing the effect on need for a second phone line at home, need for the second phone to be mobile, estimated or anticipated talk minutes, maximum spending on monthly service charges and maximum spending on initial handset charge, which would be useful for devising the marketing strategies.

### Results and Findings

To be statistical significant, a sample size of at least 30 should be used. The target for a sample size of 100 is selected because of the resource constraint. We have distributed 160 questionnaires and only 132 responded, thus the non-response rate is 17.5%. Out of the 132 completed questionnaires, only 110 are valid and included in the final analysis, while the rest are either outside the target age group of 15 to 44, or the respondents had skipped most of the questions.

A summary of the responses for each question from the 110 returned questionnaires is listed in Appendix 2.

The final sex and age group distribution of the sample is listed in the following table:

TABLE 12

#### A COMPARISON OF THE TARGET AND ACTUAL SAMPLE DISTRIBUTION BY AGE AND SEX

Age Group	Female		Male	
	target	actual	target	actual
15-19	7	11	7	10
20-24	8	6	8	5
25-29	10	9	10	17
30-34	10	12	10	17
35-39	8	4	8	9
40-44	7	5	7	5

Appendix 3 is the age & sex distribution chart for the sample.



Summary charts for the results of questions 1 to 19 is found in Appendix 4.

Below is a more detailed description of the findings from the market survey:

### Existing Service Usage

Overall distribution of CT2 users, pager users and mobile phone users is as follows:

TABLE 13

#### SAMPLE DISTRIBUTION OF CT2, PAGER AND MOBILE PHONE USERS

	only CT2	only pager	only mobile phone	only CT2 & pager	only phone & pager	all three services	none
number	1	29	10	1	17	2	50
%	1%	26%	9%	1%	15%	2%	45%

	with CT2	with Pager	with mobile phone
number	4	49	29
% of entire population	4%	45%	26%

From this, we find that there is still quite a large population who are not using any mobile telecommunications services. CT2 is the most unpopular service, while both pagers and mobile phones are quite popular. Moreover, over 66% of the mobile phone users has a pager as well (19 out of 29).

### Reason not Using Mobile Phones Now

Among the non-existing mobile phone users, many people select “people can always reach me at home or in the office” (65%) and “the mobile phone service is too costly at present” (50%) as the reasons for not using a mobile phone now. Only very few people have negative attitudes towards the mobile phones, such as “it is too troublesome to carry a phone all the time” (26%), “I do not want to be reached all the time” (18%) or “radiation from the phone is hazardous to health” (8%). This shows that people’s general attitudes towards mobile phones are positive, only that the mobile phone is not demanded at the current price level.

The most popular reason selected by the age groups 15-19 and 40-44 for not using a mobile phone is “the mobile phone service is too costly at present” (68% and 71%), while for all other age groups, “people can always reach me at home or in the office” (70%, 67%, 72% and 73%), is the primary reason given. The result is no surprise for the young age group of 15-19, as most of them are students and may not have the purchasing power. However, for the older age group of 40-44, the explanation may be more related to spending habits.

### Functions Perceived for Mobile Phone Usage

Among the non-existing mobile phone users, most people perceive “able to call people anywhere anytime” (77%) as the most useful function for having a mobile phone.

The least popular answer is “the communication means serves as a status symbol” (7%). This result confirms that the perception for mobile phones as luxuries or business only has changed, and that they are gaining wide acceptance among the mass public.

### Second Home Telephone Line

Most of the respondents believe there is a need, either “necessary” (16%) or “nice to have” (51%) another telephone line at home. This shows that despite the existing high teledensity in Hong Kong (over 50%), there is still great market potential for household telephone lines.

The result also shows that there is a relatively greater need for an additional home line for the lower age groups (over 65% for all age groups < 35), as compared to the older age groups (around 40% for age groups ≥ 35). However, there is no special relation between the need for an additional home line and household: for all groups with household size from 2-3 to above 5, around 65% to 75% responded with a positive demand. The result is quite interesting, as people’s need for more telephone lines is more related to their perception, rather than the physical needs (that is, how many people are sharing one telephone line).

No special relationship can be drawn for the need of an additional home line with income groups or sex groups.

## Having Mobile Home Telephone

People's attitudes towards mobility of the additional home telephone is generally positive (16% have chosen "desirable" and 48% have chosen "nice to have"). Moreover, among those who have chosen "no need" for an additional home line in Q5, there are 39% who chose "desirable" or "nice to have" in Q6. This is an indication that mobility is actually a premium for household telephones.

People are generally more receptive to the idea of having mobility for the additional home telephone with higher education level (0% of below secondary gave positive responses, while 52% with secondary and 76% with tertiary education gave positive responses). One explanation could be that people with higher education level are more receptive to new ideas. Another possible explanation would be that people with higher education level are, in general, more socially active.

Again, there is no strong indication for a relationship between this factor and age groups, sex groups or income groups.

## Consideration for Subscribing to the Mobile Phone Service

The result shows that people are most concerned about the phone services and ongoing service charges, while the one-off handset price and handset characteristics are less important.

Both handset characteristics and handset price are consistently ranked as less important factors for consideration across all age groups. This is a rational ranking because the phone service can have much bigger influence than the handset

characteristics towards the user using the mobile phone. However, it seems that younger age groups are more concerned about the phone services, while older age groups are more concerned about the ongoing service charge.

### Rating of Phone Services

“Can use in underground areas”, “can use in a moving vehicle” and “will not encounter busy network” are rated as less important than all the other network characteristics. The explanation for the first two factors may be attributed to the fact that these two considerations are quite individualistic, depending on people’s habits or lifestyles. However, the response of “will not encounter busy network” is quite unexpected. One possible reason is that people reference their expectations with the existing cellular phone services, and that the “busy” tone is quite commonly encountered. However, the weakness with this question is that people would have an underlying assumption about “how often” this network would be busy, as well as their maximum tolerable frequency.

There is no outstanding difference between the rating from both sexes, except for “can use in a moving vehicle”. This is consistent with having a higher driving population for males as compared to females.

No other special observations can be obtained for age groups, income groups, and education groups.

### Rating of Handset Characteristics

Overall rating for handset characteristics of “weight”, “size” and “battery life” is more important than “overall physical outlook”. This is consistent among age groups, sexual groups and education groups.

TABLE 14

#### SURVEY FINDIND- OVERALL RATING OF DIFFERENT HANDSET CHARACTERISTICS

	Overall Rating
Overall physical outlook	2
Weight	1
Size	1
Battery Life	1

#### People’s Perception Towards Handset Design

Most people (63%) prefer that the handset design be functional, rather than stylish. There are variations among the age groups (except 20-24 year olds who prefer stylish design, all the other age groups prefer functional design), but no particular implications can be drawn. Quite out of expectation, preference for the two sex groups show the same pattern.

## Usage Pattern

The research has asked questions about service usage in three areas:

- Airtime usage
- When to use the service
- Where to use the service

These questions were asked to see if there are any patterns emerging, so that the company may work out different service packages for addressing specific needs.

### Airtime usage

On the whole, most of the people (86%) think that they would likely spend about 300 minutes or less per month. About half of these people (45%) say that they may spend less than 100 minutes monthly. The usage is towards low volume.

Despite this, age is noticed as a major factor affecting usage. Younger age groups, i.e., 15- 19 and 20-24, reported that their usage would be higher; it is between 100 to 300 minutes. For the middle age group, over 50% of the people have chosen the usage level of 100 minutes instead. This should reflect the social activeness of these different age groups. Young people generally engage in more social activities. For mature adults, their use of mobile phone is believed also for personal use rather than for business purpose. As discussed above, the reasons for them not using the mobile phone at present are they already can be reached at home or office, and the existing service charge is too costly. This lends the support that the existing service charge is hardly justified to them unless it is for business purpose. These people however will be

motivated to use mobile phone if the price is lowered down. Their usage will still remain low for they are not very socially active.

Another factor affecting the usage level is whether the user is an existing mobile phone user or not. While many nonusers (87%) think that their monthly usage is 300 minutes or below, a fair amount of existing users (12.5%) said that their usage could be as high as 300 to 500 minutes. Probably this may reflect that people who first buy the service have very high communication needs, and the habit of using a mobile phone further reinforces the use of it.

Other factors such as sex and education level are not found to be related to the usage level.

#### When to use the service

The overall result revealed that about half the people (56%) say that there is not a specific time during which they use the service. Out of all the control factors, only age tends to suggest a relationship with when the mobile service is likely to be used. While the teenagers said that they are unlikely to make phone calls within certain time period, some of the working group people aged 20 and above say that they make phone calls after business hours; this suggests the use of phones by adults primarily for personal purpose.

There is also a slight difference between the existing mobile phone users and the nonusers. A higher percentage (45%) of existing mobile users said that they mainly use the phone during nonoffice hours. For the nonusers, most of them (60%) anticipate that they are unlikely to use the service within a certain time period. However, the finding may be due to the fact that the non users are not very sure of their usage



patterns, and therefore choose no specific time period to allow themselves the greatest flexibility.

#### Where to use the service

The survey revealed that where the service will be used is not related to any demographic factors. Overall speaking, over 85 % of the people reported that they would not make phone calls only within certain regions or areas.

However, the finding showed that relatively more existing mobile phone (20%) users said that they would usually make phone calls within certain places. Less nonusers (9%) say that they have such calling patterns. Such differences between the two groups of users may share the same reason accounting for any special time period when they make phone calls. It is reasonable that nonusers would prefer the option which gives them more freedom to use the service before they are very sure about their usage.

#### Pricing Scheme

Question 14 aims at asking people whether they have any preference towards the pricing scheme structure.

Different age groups do have their own preferences towards the pricing scheme structure. The teenagers who probably use more of the phone service tend to prefer a lump sum service charge with unlimited talk time (40%). In such a case, they can freely talk over the phone without worrying about the cost. For other age groups, the main

preference is a fixed monthly charge for a certain amount of talk time; any excess minutes are charged on a usage basis.

Household size is also found to be a factor affecting the choice of the pricing scheme. Relatively more people (40%) of larger households (with 4 or more members) prefer the lump sum service charge. Similarly, more non users (32 %) of mobile phone prefer to use the lump sum pricing as compared to the existing mobile phone users (21%). The fixed amount charge is perceived as a safeguard against any possibly huge charges resulting.

In total, the majority (44%) prefer a fixed monthly rental with excess minutes charged on a usage basis.

#### Maximum Charge for Phone Service and Handset

##### Phone service

The younger age groups are found to use the service more. Over half of the people in the 15-29 age group are willing to spend between \$200 to \$600 monthly. This reflects their social activeness and purchasing power, e.g., those 20-24 are more ready to pay a higher phone service charge of \$400 to \$600, while teenagers, even though they want to use the phone a lot, cannot afford much on the service charge. On the other hand, less middle-aged respondents are willing to spend much on the phone service, even though they have the necessary purchasing power.

There also exists a difference between existing mobile phone users and the nonusers. The majority (50%) of the former group is prepared to pay a higher monthly

charge. For the nonusers, the majority (46%) is only willing to pay a maximum of \$200 to \$400.

The overall results showed that close to 90% of the people are willing to pay up to \$600, with 40% preferring to pay \$200 to \$400 only.

### Handset price

The amount spent on buying a handset varies with different age groups.

Teenagers with limited purchasing power would like to spend a maximum of \$3,000. For those in their early twenties, most are working and the highest amount they are willing to pay is \$4,000. But for people in their late twenties and early thirties, the amount that they want to pay falls back to \$3,000. In fact, the choice mostly picked by these two groups are \$1,000 to \$2,000 and below \$1,000, respectively.

For the middle-aged group, the amount even falls back to \$2,000

Difference is again also between the mobile phone user and the nonuser. More existing users are willing to pay handset prices as high as \$4,000. On the other hand, most of the nonusers are only willing to pay \$2,000.

In general, over 85% of the people just want to pay \$3,000 or below, with 64% actually willing to pay up to \$2,000 only.

## Company Selection

The choice of a service provider is a very rational buying process. The ranking of the criteria (in descending order) are as follows:

1. Quality of phone service provided
2. Monthly charges
3. Initial charges
4. Quality of after-sales services
5. Company reputation
6. Quality of sales services

The result showed that people are willing to pay a higher price in order to get better phone services, such as the call will not dropped while talking to others and the network has a wide coverage. In addition, people are more long-term minded. Since the monthly charges are the recurring cost to them, they pay more attention to this part than the initial cost, for example, the handset price. This implies that a handsome reduction on the handset price may not be a very effective strategy for getting more customers. People are also very concerned about after-sales support service that can be provided by the company after they become their customers. Therefore good after-sales support service can be a company's competitive advantage. Factors such as on company reputation and quality of sales service are not so important to the customers.

### Information Source

The result is very clearcut, comments about the service provider is the most important factor of all. Nearly 60% of the people will rely on recommendations from the one they know. Feedback heard from the marketplace, ie., word-of-mouth and reports from the Consumer Council are the next important sources. About 10% of the people just rely on commercial advertisements from TV, radio, etc.

### Distribution Channel

This result is again also at an extreme. Over 60 % of the people would like to subscribe to the service from the company's retail outlet. The next most popular channel is through the direct sale force and the dealers. This somehow shows that people would like to subscribe through the company's own channel, either through the retail outlet or direct sales teams instead of going through another company.

## CHAPTER VI

### MARKETING STRATEGY

Findings of the market survey show that people's general attitude towards the mobile telecommunications service is very positive. There is no significant variation observed for the demand pattern or spending behavior for both sexes. However, for the age group of 40-44, the desirability for using mobile phones is relatively weak, as well as the amount of money they are willing to spend on the service. As for the very young age group (15-19), though there is strong demand, the purchasing power of this group is relatively low. Thus, we would define our target market as the general population, aged 20 to 39. In the following sections, we will formulate the marketing strategies for this target market segment.

## Product Strategy

### Product Concepts

Results from the market survey show that the mass market, in general, is quite receptive to having a mobile phone and that it is more concerned about having better phone services, rather than the charges. This is actually already reflected in the marketplace, with great success for the cellular phone but complete failure for CT-2.

Moreover, people's expectations for mobile phone services are very high, as reflected in the results from the market survey that all the phone services listed in the questionnaire are rated as "must" or "very important". This may be explained by the fact that most people have equated GSM cellular phones with mobile phone, and have thus, modified their expectations for mobile phones by comparing them with GSM cellular phones.

On the other hand, CAS is developed from the cordless telephone concept. Some typical features that come along with the GSM cellular phone services, including high speed mobility and territory-wide call coverage, are not available with CAS. It would thus be very difficult to obtain widespread market acceptance for CAS if it emerges from the market as another type of mobile phone, but with inferior features, unless there is a substantial reduction in price. By introducing the CAS as a substitute to the existing GSM cellular phone market, it is likely to cast another failure story as for CT-2.

On the contrary, when comparing the CAS with existing fixed-wire telephones, there is a very visible extra value of mobility, plus enhanced functions such as paging or short messaging service. Besides, the unstable voice quality which is one of the major deficiencies for the existing cellular phone service when compared to using fixed-wire telephones, is not present with CAS. According to some product studies, people on the other end of the telephone call cannot distinguish whether the people on this end are using a fixed-wire phone or a CAS.

Moreover, results of our market survey reflected that there is great demand for additional house phones, especially when there is an extra mobility feature. Actually, this demand for in-house mobility can be observed from the wide market acceptance of the CT-1 that was launched to the market many years ago, and still has good market potential today. With much better mobility and functionality, CAS can be in a good position to compete from this direction instead.

Besides the advantage for product feature differentials, the greater market potentials of fixed-wire telephones in comparison to the mobile phone market gives another good reason for positioning CAS against the former rather than the latter service. The result obtained from the market survey showed that the most common reason for people not having a mobile phone now, which is the majority population, is that they believe they can easily be reached at home or in the office. It indicates that the demand for a mobile phone is not built up for these people yet, especially with the excellent Public Switching Telephone Network (PSTN) which is so accessible and convenient at present. Therefore, by creating the image of being a close substitute for fixed-wire telephones, rather than the cellular phones, we are exposing the service to



the more widespread potential customers, and thus making it easier to gain market acceptance.

### The Phone Services

Basically, the CAS exhibits many quality features in the phone services which are expected from the public, including clear voice quality, not encountering a busy network (because of its high network capacity), not having the call dropped during communication (because of its better handoff capability), and privacy (by using the TDMA technology).

For the coverage requirement, though most people have rated good territory coverage as a "must" characteristic for mobile phone services, we would not choose to go for achieving this objective. The main concern is that the CAS product is not suitable for a wide area of coverage with its micro-cell architecture. Even in a small city like Hong Kong, the number of base stations required for providing territory-wide coverage will incur very high costs for both infrastructure setup as well as the recurring monthly rental for allocating the base stations, and thus greatly reduces CAS's competitiveness to the very low-cost fixed-wire home phones.

Instead, we would concentrate on providing full coverage within the urban area, plus limited access in the rural areas where there is a larger population, but definitely not in the country parks and hills or outlying islands with few or no people. This would cover almost 80% of the areas in which most people live or work, or spend their leisure time.

If we estimate that people would spend one-third of their time at home, one-third in the office and one sixth walking on the street, shopping or dining in restaurants, the utilization time for CAS is more than 100% above the fixed-wire phones at home. Besides, the convenience of being able to be reached by the same number even when people move or change jobs could be perceived as another premium of CAS over fixed-wire house phones. We believe there is already great market potential for this kind of limited mobility telecommunication service that can be projected from the demand for the call forwarding function and territory phone numbering scheme (that is the phone number is no longer divided by districts) currently offered by the telephone company, even though these value-added features provided on the fixed-wire house phones can just partially resolve the problem. CAS should be able to find its place in the market as providing a complete solution for low mobility personal telecommunication services, if the price offered is competitive enough.

Ability to use in underground areas is also rated as next most important in the market survey. These areas can also be covered if enough base stations can be installed in the tunnels or railway stations. However, since the rental cost for installing the base station is much more significant than the equipment cost, the best way to penetrate the coverage of these areas is by using a profit sharing approach to cooperate with the tunnel or railway companies. Only when we have gained widespread market acceptance, and the accessibility of CAS becomes a premium to the customers of these companies, will this profit-sharing approach become appealing to the tunnel or railway companies. Thus, we can postpone the coverage to these areas to a later phase of implementation in order to avoid the unnecessary cost burden.

In order to provide a more integrative solution to the mobile phone users who can afford to pay more for better services, we would also suggest to provide a dual-mode handset, which can switch to and from the GSM and CAS network, depending on the network condition while establishing the call for connection. When people are staying in one location or moving at low speed within the urban areas that are covered by the CAS network, the CAS network would be selected automatically for communications, for it provides better voice quality with lower charges. On the other hand, when people are staying at the more remote areas unreachable by the CAS network, or moving at high speed, the handset could automatically switch to using the GSM network. However, there are limitations for this kind of integration, which is that the switching between these two types of network can only be done for outgoing calls, and once the call connection is established, it is not able to switch to another network without having the call dropped. Among the existing CAS technologies, only DECT has already implemented this functionality. However, details of which technologies among DECT, PACS and PHS should be selected would require another full study before good recommendations can be made.

#### Handset Characteristics

Another finding in the market survey is that people are generally less concerned about the handset characteristics, as compared to the phone services or cost concerns. However, nice handset features could also give relative advantage to the product when there is true differentiation. When comparing the handsets for CAS with GSM, the two major differences are lighter weight and longer battery life. These two

characteristics are both rated highly in the market survey. Thus, the CAS handset can be positioned as a truly handy personal equipment that can be carried around very conveniently, without having to pay much care and attention.

#### After-Sales Services

The after-sales service is also rated highly in the market survey when people choose a company for service subscription. With the competitive advantage of having strong customer service teams in Hutchison Telecom, we should build up a very good image for the CAS service to be provided by the company, so as to create another important differentiation with the competitors.

#### Supplier's Concern

Because of the nature of cellular phone technology, the total capacity (that is, the maximum number of call channels available for making simultaneous calls) of the network is limited. To increase capacity, the cell-splitting technique, which reduces the coverage area of each cell such that more cells can be allocated within the same area may be used. However, there is still a limit to the maximum reducible cell size with the existing GSM technology. Another way to increase capacity is by using more frequency spectrum. As before, there are also absolute limits, as the GSM is designed to work only within the 800-900MHz spectrum.

Thus, from the technology point of view, there are many constraints for using the GSM or any other existing cellular phone technologies in place of a fixed-wire

telephone network, especially in congested cities with exceptionally high teledensity like Hong Kong. Network congestion is expected, which means a big degradation in service quality. With the existing network capacity offered by the GSM technology, it is far from enough to support the huge volume of traffic.

On the other hand, CAS uses the micro-cell technology, and operates at a very high frequency spectrum from (1700 MHz to over 2300MHz) which is more available. More importantly, by using the TDMA or CDMA technologies for transmission, more efficient utilization of the frequency spectrum can be achieved. All these factors have made the CAS exceptionally suitable for application in congested urban areas with very high demand for network capacity which are unmatched by the existing cellular phone services.

Another great advantage of the CAS system is its relative simple network structure, which allows the CAS base stations to connect directly with the existing PSTN, without having to have a real big and full scale independent network constructed before a workable solution can be put up, as in the case for GSM. Thus, in the initial stage, we can implement the CAS system in large scale public or private housing estates, commercial buildings or shopping arcades in the business centers in Central, Admiralty, Wanchai, Causeway Bay, Tsim Sha Tsui, Mong Kok and factories in Kwun Tong, Cheung Sha Wan, Tsuen Wan, Kowloon Bay, Tsai Wan, etc.

By this way, not only may the investment risk be minimized, but the cost may be kept very low. When the product is more accepted in the market, and starting to generate more profit or have increasing profit potential, the network may flexibly be extended to provide wider coverage and better service.

## Pricing Strategy

The setting of the price largely depends on two major factors; market demand and cost. The former sets the ceiling, while the latter is the bottom line. A market-driven pricing strategy also needs to consider the willingness and ability of the customers to pay, as well as prices of the close substitutes.

### Pricing Objective and Strategy

#### Price sensitivity

As discussed above, the product strategy for CAS is to put the service as a personal phone line used in-house, with an extra benefit of providing outside mobility. The target segment is mainly the young to middle age groups, i.e., 20-39. Overall speaking, the major reason for these people not using the mobile phone service is they are readily reached at home or office. Next comes to the reason that the service is too costly. Even though these people are not very price sensitive, a reasonable low price can still stimulate their use of the service.

#### Cost structure

The network cost can be kept at a low level because very extensive coverage and very high quality mobility service are not to be provided under the suggested product strategy. In addition, the variable cost of the service is a lesser part of the total

cost. The fixed cost can be absorbed more quickly if the market base can grow big. This means the overall profitability of the service is increased.

### Market penetration pricing

The above analysis has pointed out it would be beneficial for the company to build up a large customer base first, so that the average service cost would be lowered down and ultimately increases company's profit. In addition, large customer base helps to increase the bargaining power of the company to its suppliers, so that further cost advantage can make the service more attractive. The objective of building a large customer base calls for the setting of a relatively low price on this innovative service. The strategy is thus to use a low price to penetrate the market at the service introductory stage.

However, Hutchison Telecom should not aim at being the least cost service provider by working on a cheap value strategy. As discussed in the SWOT analysis, Hutchison Telecom lacks its own infrastructure for building the CAS network at a very low cost. Unless the company can find other ways to leverage the cost on its already established mobile network, it cannot use low price as the only competitive advantage. The strategy is more focussed on achieving an outdoor mobility service as far as possible within a reasonable price, instead of simply working on a very low price. After all, the phone service quality is more important than other buying criteria.

## Price Setting

### Service usage

According to a recent study done by OFTA about changing the price structure of local phone calls, it is reported that the number of monthly call minutes made by an average household is 282 minutes. But since our target customers who would buy the CAS are based on the need for an additional telephone, we may expect the in-house usage to be higher. Thus, doubling in usage may amount to approximately 500 to 600 minutes.

For phone calls making outside the home, only the 20-24 age group said that its monthly usage is from 100 to 300 minutes, while the other age groups reported their monthly usage to be below 100 minutes.

### Maximum charges willing to pay

The maximum monthly usage charge willing to be paid by the target customers is about \$200 to \$400 dollars. Only the age group of 20-24 is willing to pay a higher price of \$400 to \$600. For the handset, the most widely accepted price is \$2,000. Again the age group of 20-24 is more willing to pay a higher price of \$3,000 to \$4,000.



### Price of Close Substitute

Since the service aims to provide a cost-effective solution offering the benefits of both fixed-wire lines and mobile phones, the price of the service has to be comparable to both services. At present, the monthly service charge of a residential line is \$ 65. However, the CAS may be able to charge higher prices because it offers extra benefits of both indoor and outdoor mobility.

For the mobile phone service, the lowest price now available in the market is \$400 for a usage rate of 100 minutes and \$700 for a usage rate of 300 minutes. Thus, the service cannot be economically used as a home phone line mainly because of expensive airtime charge.

To have a close substitute to the CAS, the customer may subscribe to both a fixed-wire line and a mobile phone. With the call forwarding function, the customer can forward the mobile phone calls to his home telephone line when he is back home. The limitations of this solution are that the customers have to pay for two phone sets, and bear the inconvenience of activating the call forwarding function everytime. The monthly service charge of this combination is as follows:

TABLE 15

SERVICE CHARGE ON MOBILE PHONE, RESIDENTIAL TELEPHONE  
LINE AND CALL FORWARDING FEATURE

	100 minutes	300 minutes
Mobile phone	\$ 400	\$ 700
Residential line	\$ 65	\$ 65
Call forwarding	\$ 35	\$ 35
Total	\$ 500	\$ 800

Source: Tariff tables of Hutchison Telecom, HK Telecom, SmarTone & Pacific Link

CAS -- monthly service charge

The above analysis has suggested the price range for CAS may be from \$65 to \$500 or \$800, depending on the call minutes made outside the home. The usage level compared is based on the average usage of phone calls made outside the home by the target customers. Certainly, the service charge can be above \$65 because it gives both indoor and outdoor mobility. The price can be increased close to, but not exceeding, the maximum level. CAS is not positioned as another mobile phone service, but rather addresses on communication needs at home. With the CAS coverage being not as extensive as the GSM service, and supporting only low mobility, its price cannot be as high as the mobile phone service. A far lower price than mobile phone service is set, so as not to lead people to directly compare CAS with mobile phone service. However, the tradeoff should not be too low so that it can still give better profit margins than fixed-wire lines.

Considering also the maximum amount willing to be paid by the target customers, the price level for the service may be set as shown below:

TABLE 16  
SUGGESTED TARIFF TABLE FOR CAS

Call minutes made outside the home	100 minutes	300 minutes
Call minutes made at home	unlimited	unlimited
Monthly service	\$ 300	\$ 500
Rate for additional minutes made outside	\$ 1 / min	\$1 / min

The pricing scheme has separated the call minutes used at home and outside. In addition, the excess call minutes made outside are charged on a usage basis. The reasons for setting such a pricing structure are as follows:

- The call minutes made at home and outside are distinguished. This is done to reinforce the product concept of using the service for both at home and outside, instead of making the service look like a simple mobile phone service.
- Unlimited talk time is allowed at home, so as to make the service comparable with the fixed-wire line.

For phone calls made outside the home, the monthly charge covers a fixed amount of call minutes. Additional minutes are charged on a usage basis. Such a pricing scheme helps to limit the use of network resources by customers to a certain level within the price they are paying. In fact, such a pricing method is also most preferred by the target customers.

- The suggested overall price represents about a 40% discount on the existing services, which certainly is attractive. Moreover, this matches well with the market's expectation of the service charge level.

### CAS -- handset price

Although handset price is not the top priority concern of the customers, the market expects the handset price to be low. Possibly, the price competition of the mobile phone handset has helped to build up such an expectation. Fortunately the CAS technology is able to support such a low price. According to the quotation from various suppliers, the CAS handset costs approximately \$1,500 to \$2,500, which can meet the market expectation.

Even though Hutchison Telecom does not have the largest market share in the mobile market at present, it is still very likely that the company can regain the leading position with its aggressive move, as seen recently. With its influential power in the market, it may be able to negotiate even a better deal with handset manufacturers. Apart from service charge, low handset price is still an additional inducement for customers to try the service.

### Detailed cost analysis

The above calculation has looked at the price issue from the market perspective. However, the price level must also be supported by the cost in order to be profitable. The suggested price level is therefore subject to a detailed cost analysis.

## Promotional Strategy

### Target Audience

This includes the age group from 20 to 39, who are to be the potential customers of the service.

### Message Appeal

#### Introducing the concept of personal communications

The introduction of CAS is to break down the rigid demarcation of fixed-wire line and mobile phone service and aims to bring out the concept of personal communications. That is the service to enable one to always keep in touch with the outside world on a personal basis with the same communication means, irrespective of where one is located. Since this is a new concept to the market, the promotional program must educate the public about this concept, so as to build up the service demand.

#### Good value for money

CAS aims to provide an inexpensive solution for catering to customers' needs to communicate at home or outside by the same means. The promotional message should stress on the point that the service does not only give an additional line for phone calls made at home, but with minimal expense that can give the convenience for

communicating outside. In other words, a service which allows customers to communicate freely at an inexpensive price.

#### Focus on low usage package

Since the service targets to customers with a casual need for communicating outside, a low usage package may be featured as a major appeal for arousing their attention and interest.

#### Strong association of the service with the company name

Phone service has received the greatest emphasis in the service selection. Such an attitude is advantageous to Hutchison Telecom which already has had a strong reputation in wireless services. To build up the CAS position of having a reasonable level of outdoor mobility, the CAS should be tied closely with the company name. In such a case, the service can quickly build up a good image based on the company's goodwill and reputation.

#### Promotional Program

Since the service is a new one to the market, a comprehensive marketing program has to be conducted for achieving the following objectives in order to build up customer preference:

### Creating market awareness

With the service working on a new product concept, effort needs to be spent on building the initial market awareness towards the service.

- TV advertisement

The theme is to put the service introduction in a real life context, so that customers can quickly grasp the concept of what personal communication means. In addition, the service should be featured as a new service item to Hutchison Telecom's wireless service family. This helps to build up customer confidence towards this service quickly based on company image.

- Point-of-purchase materials at company's retail outlets

Point-of-purchase materials are to be offered in the company's retail outlets, since Hutchison has built up its retail chain covering nearly every district of Hong Kong. Such wide distribution can help arouse the interest of the general public.

### Disseminating product information

- Print advertisement

This allows for more space to display the product details.

- Product leaflets distributed at retail outlet

The retail outlets can be used as a channel for distributing the product leaflets and for product display.

- Exhibitions and trade shows

From time to time, there are a number of exhibitions or trade shows organized for the general public. Relevant examples include the electrical appliances exhibition and show case organized by the HK Trade Development Council. All these are also good channels to reach the target customers and allow them to understand the service more clearly.

### Getting customer conviction

- Special discount program

To induce customers to trying this new service, some sales promotion programs may be initiated. For example, this may include free monthly service charge for those who are first lot subscribers. Attractive discounts on the handset price can also be offered as promotional inducements.

- Incentive referral program

The survey findings showed that people are more readily influenced by their friends, colleagues and family members. Thus, in order to gain wide acceptance of the service, an incentive program for rewarding those customers who refers others to join the service may be used.



## Distribution Strategy

### Utilize Extensive Retail Outlet

As discussed in the above analysis, CAS should move toward a basic product for the mass market. To obtain maximum reach to the general public, an extensive retail outlet has to be used. Coincidentally, the majority of the potential customers also prefers to subscribe to the service through the company's own retail outlets. Hutchison Telecom has an advantage on this aspect. Out of all the major competitors, it has the most retail shops.

### Use of Direct Sales Team for Approaching the Employees of Large Corporation

Instead of waiting customers for walk in to the retail outlets for service subscription, the company can employ its direct sales team to actively approach the employees of some large corporations. With a special offer for bulk subscription to the service, it gives an incentive for the corporation to support this kind of promotion program, to be viewed as a staff benefit program. For Hutchison Telecom, this can also be an efficient way for reaching the mass market if the sales team should approach sizable companies.

## Road Shows

The company can run road shows in some shopping malls or large housing estates. This involves an exhibition of educating the public about the concept of personal communications. A sales booth will also be set up to display the product and its leaflet. The road shows can run with a sales promotion program, so as to arouse the interest of the general public and further stimulate the sales.

## CHAPTER VII

### LIMITATIONS & FURTHER STUDIES

Though we have made every effort to provide a thorough analysis for the market prospect of CAS for Hutchison Telecom, with an attempt to recommend the right marketing mix for the company to launch the product, there are still many limitations in our study which we would like to highlight below:

- i. Since most of the questions in the questionnaire collect objective information about the respondents, the response should be stable over time. For questions relating to people's attitudes towards the mobile phone services, results for some of the related questions have high level of consistency, for example, people ranking high for phone/network services in Q7 when asked on the factors of considering whether to subscribe to the mobile phone service, also give consistently high ranking for quality of phone services provided in Q17 when asked about the criteria for choosing a company for service subscription. Thus, we believe there is high reliability of response for the questionnaire results.
- ii. Results of the market survey showed very high expectations for the mobile phone services. The reason could be attributed to the fact that most of the respondents answered our questions with reference to the existing high end cellular mobile phone services, rather than thinking of mobile phone service in the generic sense. Thus, this may introduce limitations on the internal validity of the survey. However,

this result is quite expected because the cellular mobile phone is the most popular product in the market, and that it would be very difficult to ask people to give their opinion on some imaginary products that are not yet available in the market. We should thus interpret the result with due care.

- iii. Quota sampling technique is employed in an effort to minimize sampling bias, which has allowed us to have a sample with the sex and age mix that is close to the population. However, we are unable to give a well-balanced mix of people with different occupations and in different industries. Thus, there is still threat of external validity.
- iv. The overall response rate is satisfactory (83%). Among the non-response group of people, there is no strong resemblance on their demographic characteristics. We believe these non-responses are random behaviour, rather than bias.

In future studies, we would recommend more in-depth analysis of the following:

- i. There are three CAS technologies, PHS, DECT and PACS, available in the market. A more in-depth comparison of these technologies can help the firm to select the right choice. The selection will best fit with the company's existing network infrastructure so as to achieve the greatest synergy, as well as fit in the market strategy and the long term business goal.
- ii. In the market survey, we have obtained only people's rankings or ratings of importance for the various factors used in the selection of a mobile phone service. More information revealing the tradeoffs between the various selection criteria

- should be collected, so that the right balance of the service quality and price for achieving the maximum revenue can be determined.
- iii. More concrete data for the actual cost of building the CAS network should be collected, so that the bottom line for setting a price can be set.
  - iv. In order to precisely define the right marketplace with highest profit potential for Hutchison Telecom's CAS, it is worth investigating the positions of the various mobile communication services provided by the major market players on a market positioning map.

As stated in Chapter One, this study is indicative in nature, which attempts to work out the right direction for developing the CAS technology into a right product appealing to the market. The market survey showed that people are demanding towards the mobile phone service. It is unwise to put CAS directly in competition with the mobile service, since the technology is not going to support an extensive network coverage and high mobility. Hutchison Telecom should make use of the cost advantage brought by the technology to tackle the latent demand for an additional line used at home. The technology in addition gives extra benefit to the customers by providing both indoor and outdoor mobility.

Further information on the tradeoffs between service quality and price has to be collected, so that the right mix of service quality and price can be determined. On the whole, Hutchison Telecom has to work on a low price strategy for getting high market penetration, so that the network fixed cost can be absorbed quickly to improve profitability. However, the company is not advised to focus mainly on cost, since its

strength is more on network quality rather than achieving the lowest network running cost. In addition, service quality received more importance than price in the buying process. A detailed study on the different standards of CAS technologies, namely, PHS, DECT and PACS is suggested. This is to find out the right technology for allowing the company to get the greatest synergy with its existing network infrastructure, so that quality service can be passed on to the new product, and cost can be maintained low at the same time.

In addition to a good quality service priced at a reasonable price level, Hutchison Telecom can further build its competitive advantage on its customer service and use its extensive retail outlet for getting the maximum market impact. Through this integrated marketing mix, it is likely the company can make this new product launch a success.

## APPENDIX 1

## SAMPLE QUESTIONNAIRE

**A survey on the personal communications services in Hong Kong**

**Hi, we are a group of MBA students conducting a market survey on people's attitudes towards personal communication services. Please help to fill out the following questionnaire, it will take you 10 minutes. Your responses will be kept strictly confidential. The information collected will be used for academic research in The Chinese University of Hong Kong. Thank you very much for your time and participation.**

1. Are you using any of the following services ?  
*(Please tick all that apply; you may choose more than one)*
  - CT2
  - Pager
  - None
  
2. Are you using a mobile phone currently ?
  - Yes *(please go to Q5)*
  - No
  
3. What is the reason that you are **NOT** using a mobile phone now ?  
*(Please tick all that apply; you may choose more than one)*
  - People can always reach me at home or in the office
  - It is too troublesome to carry a phone all the time
  - I do not want to be reached all the time
  - The mobile phone service is too costly at present
  - Radiation from the phone is hazardous to health
  - Other, please specify \_\_\_\_\_

4. Would you think any of the mobile phone function(s) listed below would be useful for you?  
(Please tick all that apply; you may choose more than one)

- Able to call people anywhere anytime
- Allows people to leave messages to me anytime when necessary
- Allows people to talk to me directly anytime
- Allows people to reach me with the same number, disregarding where I live or work
- Allows me to keep up with my peer group who has also used the same communication means
- The communication means serves as a status symbol
- None
- Other, please specify \_\_\_\_\_

5. What do you think about having another telephone line at home?  
(Please tick one)

- Necessary
- Nice to have
- No need

6. How would you like it if the additional telephone line can also be carried along and used outside your home?  
(Please tick one)

- Desirable
- Nice to have
- Do not care, indifferent
- No need

\*\*\*\* If you have selected "None" or "No need" for all questions from 4. to 6., please go to Q20; continue with Q7 otherwise.

7. In the future, there will be different types of mobile phone service available in the market. How would you **RANK** the importance of the following factors when considering whether to subscribe to one?

(Please rank from: "1" = Most important to "4" = Least important)

- ( ) Phone / network service, e.g. clear voice, can make/receive call anywhere ...
- ( ) Handset characteristics, e.g. weight, size ...
- ( ) Handset price
- ( ) Service charges
- ( ) Other, please specify \_\_\_\_\_



8. When considering the phone service, how would you **RATE** the importance of the following in your selection ?

(Please tick one response for each item)

	Must have	important	Nice to have	Would not care
◆ Clear voice quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Can use anywhere in the territory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Can use in underground areas, e.g., tunnels, railway stations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Can use in a moving vehicle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Will not encounter busy network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Would not have the call dropped while communicating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Privacy - your message could not be heard by a third party	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. When choosing a handset, how would you **RATE** the importance of the following characteristics ?

(Please tick one response for each item)

	Very important			Not important
◆ Overall physical outlook	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Weight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Size	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Battery life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
◆ Other, please specify _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. How would you like the handset design ?

(Please tick one)

- stylish  
 functional

11. How many talk minutes would you normally use / anticipate to use in a month ?

(Please tick one)

- Below 100 minutes  
 100 - 300 minutes  
 301- 500 minutes  
 Above 500 minutes

12. Will you normally use / anticipate to use the mobile phone during some particular time period of the day ?

(Please tick one)

- Business hours ( 9:00a.m. to 6:00p.m.)  
 Non business hours ( 6:00 p.m. to 9:00 a.m.)  
 No special time period

13. Will you normally use / anticipate to use the mobile phone in some particular region(s) (e.g. in Central or Tsim Sha Tsui) ?  
(Please tick one)
- Yes, please specify \_\_\_\_\_
- No
14. Which of the pricing methods for mobile phone service do you prefer ?  
(Please tick one)
- Lump-sum cost with unlimited talk minutes
- Fixed monthly charge for certain amount of talk minutes, any excess talk minutes is charged on usage
- Totally charged on usage
- Indifferent
15. How much would you spend, maximum, for mobile phone service each month?  
(Please tick one)
- below \$200
- \$201 - \$400
- \$401 - \$600
- \$601 - \$800
- \$801 - \$1000
- above \$1000
16. How much would you spend, maximum, for buying the handset ?  
(please tick one)
- below \$1000
- \$1001 - \$2000
- \$2001 - \$3000
- \$3001 - \$4000
- above \$4000
17. How would you **RANK** the following criteria when you choose a company for service subscription ?  
(Please rank from: "1" = Most important to "6" = Least important)
- ( ) Initial charge
- ( ) Monthly charges
- ( ) Quality of phone service provided
- ( ) Quality of sales services
- ( ) Quality of after sales services
- ( ) Company reputation

18. Which of the following sources of information would you rely on **MOST** when you choose a company for service subscription ?  
(Please tick one)

- Commercial advertisement from TV, radio, newspaper, etc.  
 Commercial advertisement from industry magazines  
 Report from Consumer Council  
 Word-of-mouth  
 Recommendations from people you know  
 Product brochure  
 Sales people

19. Which channel would you choose for service subscription ?  
(Please tick one)

- Company's retail shop  
 Dealers  
 Direct sales  
 Telephone order  
 Mail order  
 Electronic shopping (Internet)

20. To which age group do you belong ?  
(Please tick one)

- |                                   |                                      |
|-----------------------------------|--------------------------------------|
| <input type="checkbox"/> below 15 | <input type="checkbox"/> 30 - 34     |
| <input type="checkbox"/> 15 - 19  | <input type="checkbox"/> 35 - 39     |
| <input type="checkbox"/> 20 - 24  | <input type="checkbox"/> 40 - 44     |
| <input type="checkbox"/> 25 - 29  | <input type="checkbox"/> 45 or above |

21. Please tick your sex.

- Male  
 Female

22. What is your occupation ?  
(Please tick one)

- Entrepreneur  
 Senior manager  
 White collar  
 Outdoor sales  
 Blue collar  
 Student  
 Housewife  
 Unemployed  
 Other, please specify \_\_\_\_\_

23. To which of the following industries does your company belong ?  
(Please tick one)

- Manufacturing
- Construction
- Wholesale, retail, and restaurants & hotels
- Import / export trades
- Transport, storage and communication
- Financing, insurance, real estates and business services
- Community, social and personal services

24. What is your personal monthly income ?  
(Please tick one)

- less than or equal to \$10,000
- \$10,001 - \$20,000
- \$20,001 - \$30,000
- \$30,001 - \$40,000
- above \$40,000

25. How many members are there in your family ?  
(Please tick one)

- 1
- 2 - 3
- 4 - 5
- more than 5

26. What is your monthly household income ?  
(Please tick one)

- less than or equal to \$10,000
- \$10,001 - \$30,000
- \$30,001 - \$50,000
- \$50,001 - \$70,000
- above \$70,000

27. What is your educational level ?  
(Please tick one)

- Below secondary
- Secondary
- Tertiary or above

\*\*\*\*\* \*\*\* THANK YOU \*\*\* \*\*\*\*\*

## APPENDIX 2

## SUMMARY OF QUESTIONNAIRE RESPONSES

Below is the summary of responses for each question from the 110 valid returned questionnaires:

Question No.	Expected Response	Non-Response	Invalid Response	Valid Response
1	110	0	0	110
2	110	0	0	110
3	81	1	0	80
4	81	0	0	81
5	110	0	0	110
6	110	0	0	110
7	110	13 <sup>1</sup>	9 <sup>2</sup>	88
8a	110	14	0	96
8b	110	14	0	96
8c	110	13	0	97
8d	110	13	0	97
8e	110	14	0	96
8f	110	13	0	97
8g	110	14	0	96
9a	110	16	0	94
9b	110	15	0	95
9c	110	15	0	95
9d	110	14	0	96
10	110	13	0	97
11	110	15	0	95
12	110	13	0	97
13	110	13	0	97
14	110	14	0	96
15	110	13	0	97
16	110	13	0	97
17	110	13	8 <sup>2</sup>	89
18	110	16	0	94
19	110	16	0	94
20	110	0	0	110
21	110	0	0	110
22	110	0	0	110
23	110	22 <sup>3</sup>	0	88
24	110	6	0	104
25	110	0	0	110
26	110	6	0	104
27	110	6	0	110

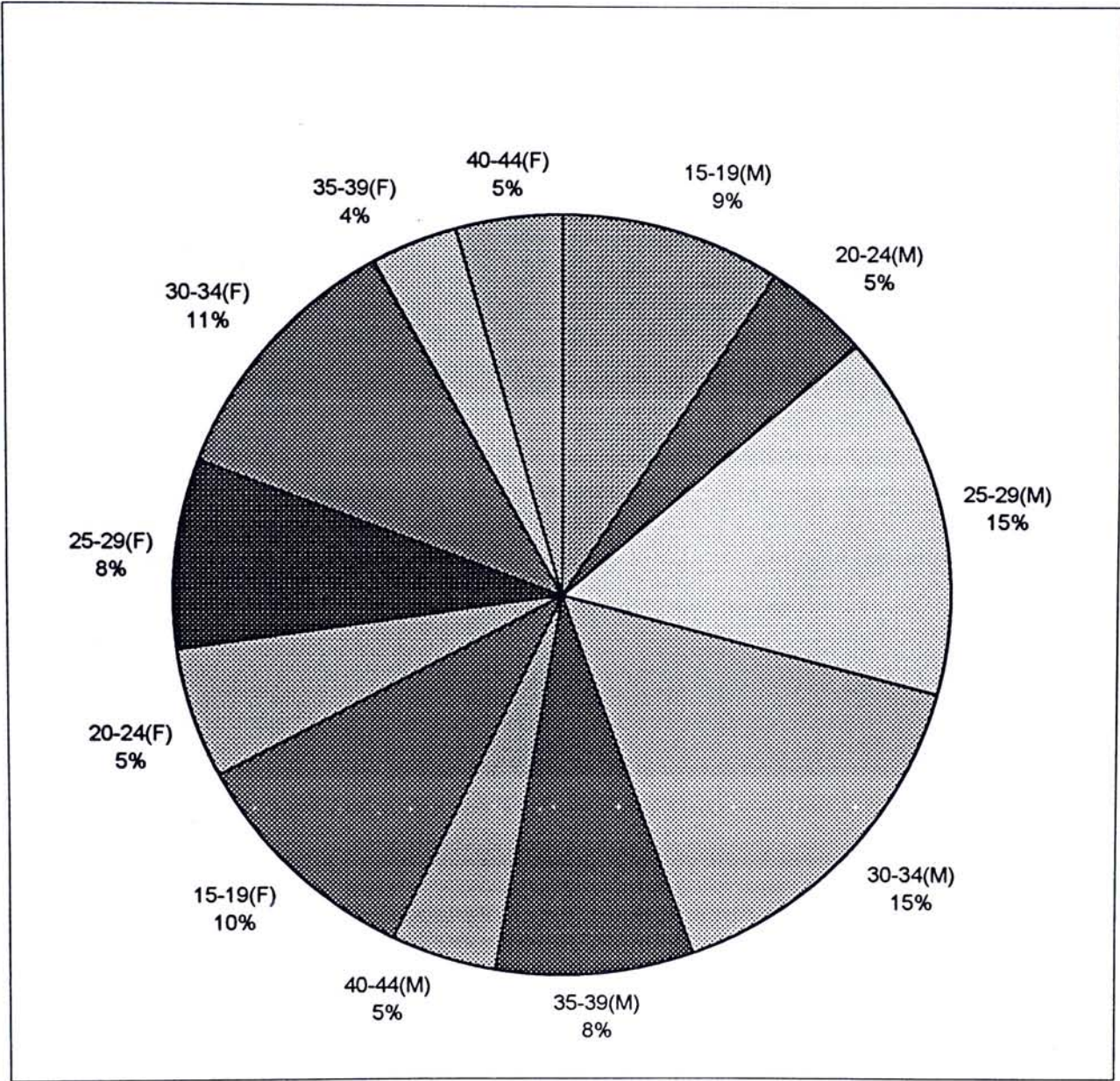
<sup>1</sup> For Q7 to Q19, there is relatively higher non-response, this is mainly due to the fact that some of the respondents has miss interpreted the instructions and skipped these questions which they should actually answer.

<sup>2</sup> Q7 and Q17 asked people to rank the listed attributes, but people has given ratings instead, giving the relatively higher invalid responses of approximately 8%.

<sup>3</sup> Q22 has received quite a high non-response rate (20%). One reason is that the list in the questionnaire is not extensive enough, missing choices for civil services, education and an open option for "others/miscellaneous". Another reason is that some of the respondents are students or housewives who do not have an employer.

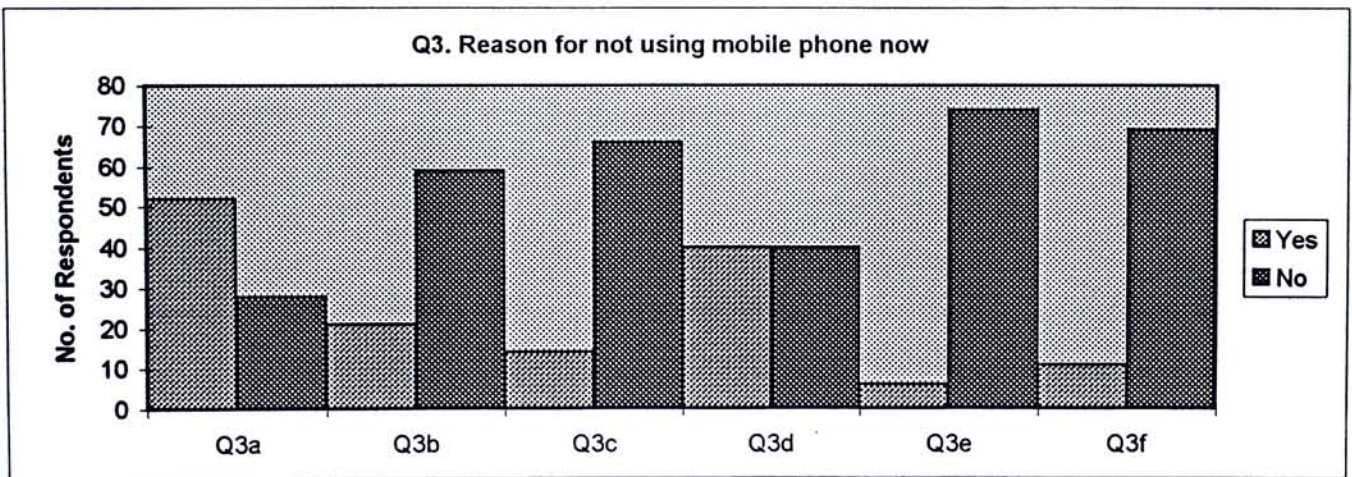
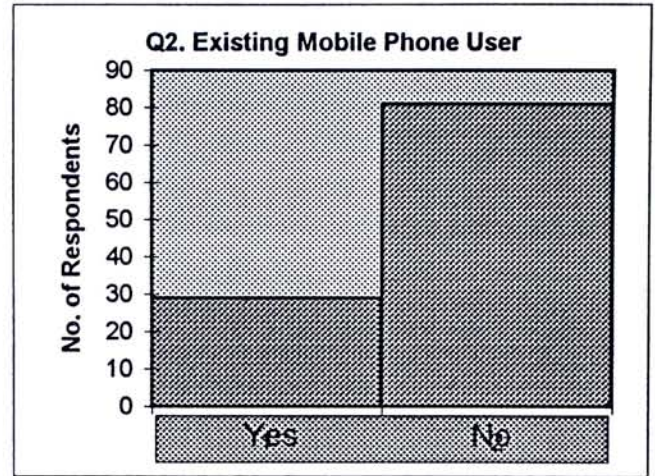
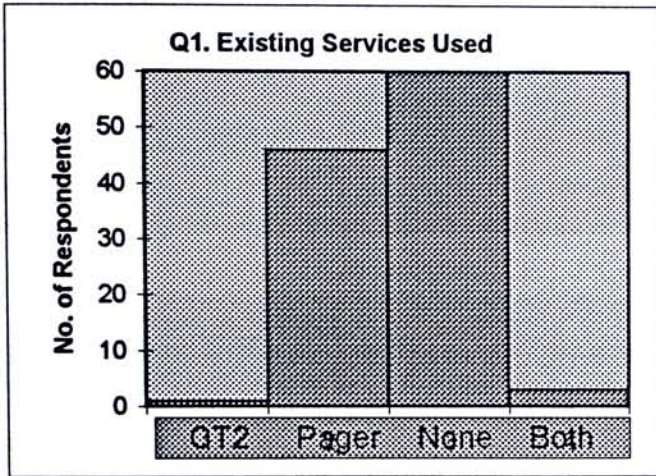
APPENDIX 3

AGE & SEX DISTRIBUTION OF MARKET SURVEY RESPONDENTS



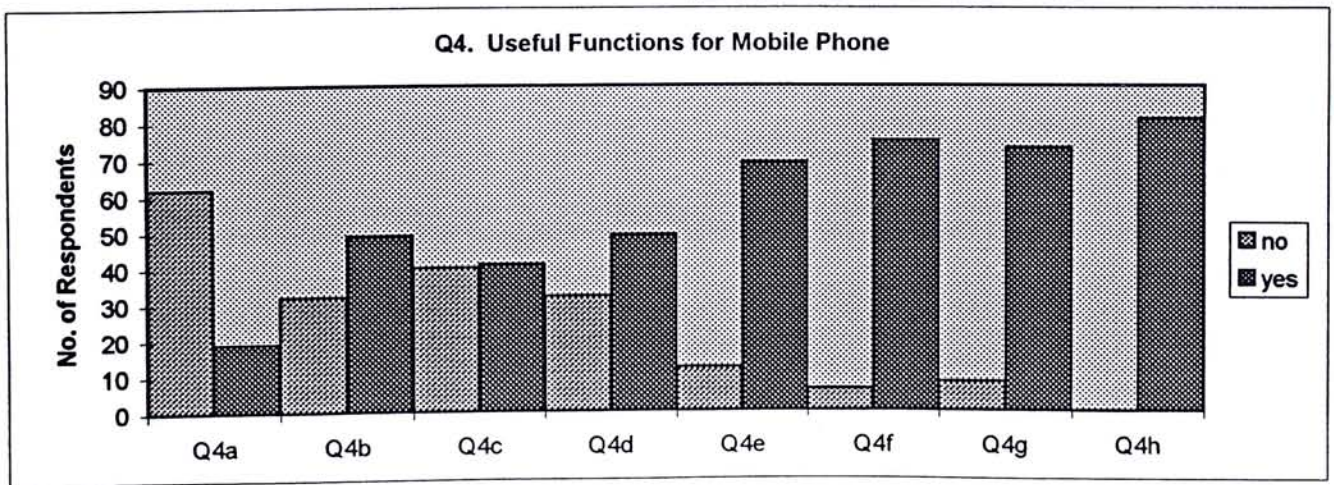
APPENDIX 4

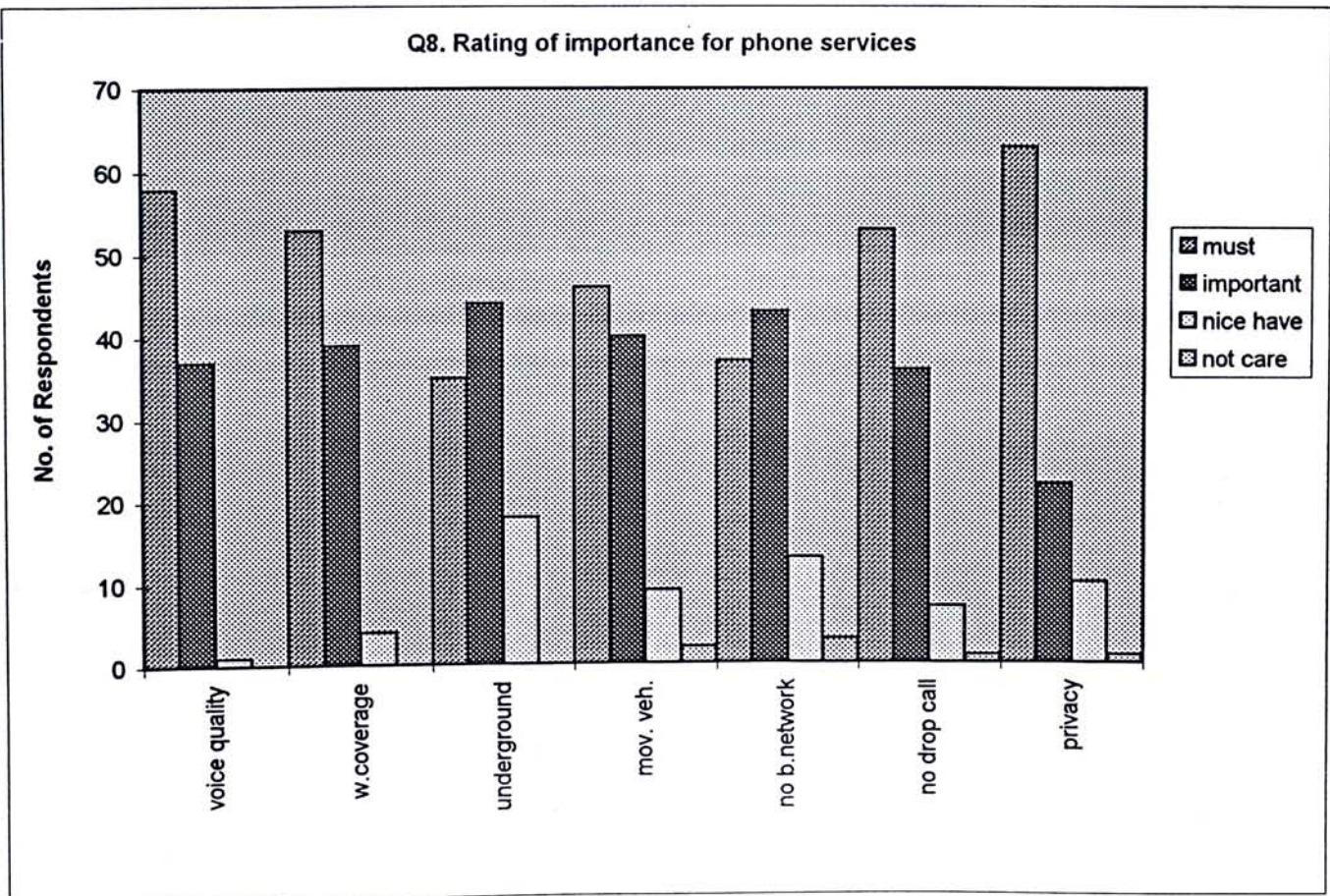
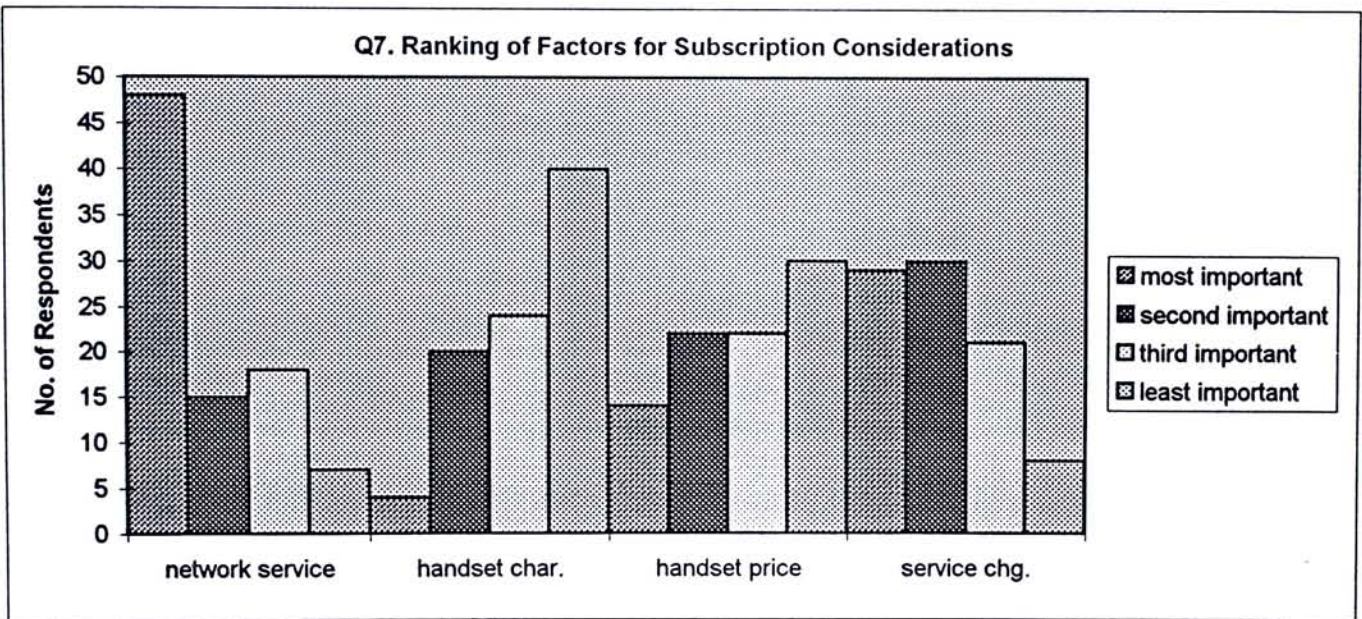
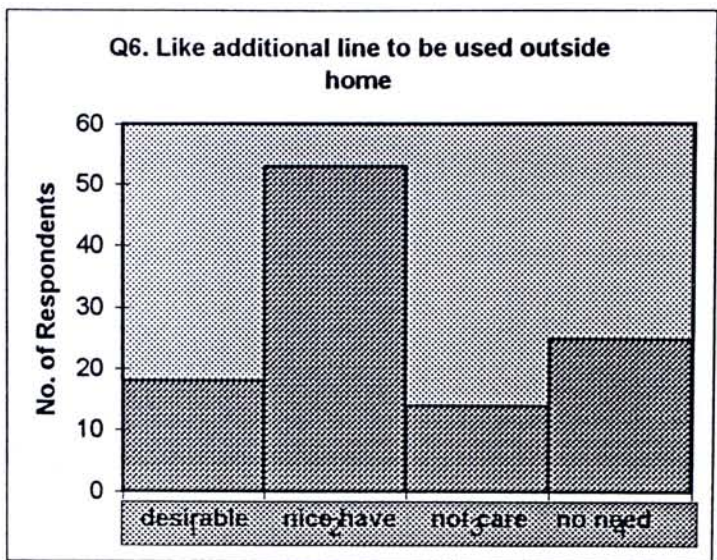
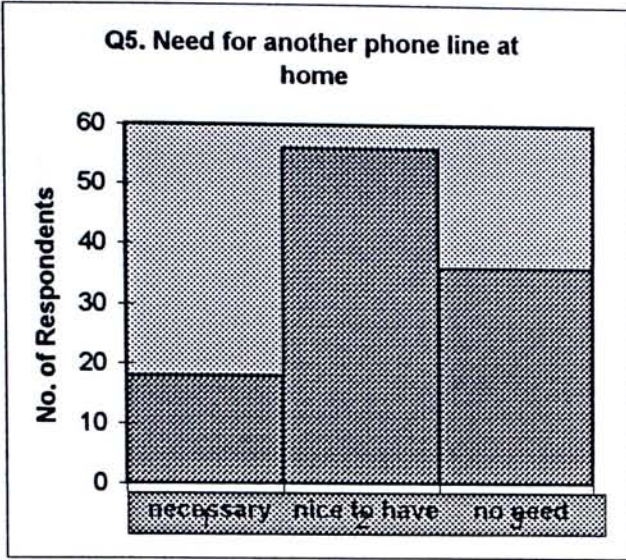
RESULTS OF MARKET SURVEY



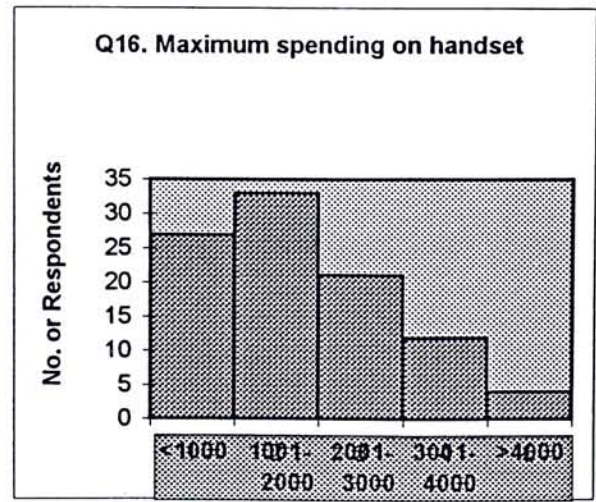
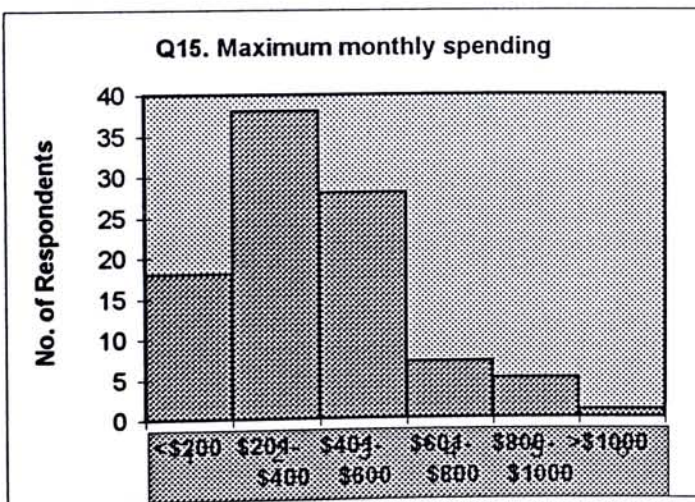
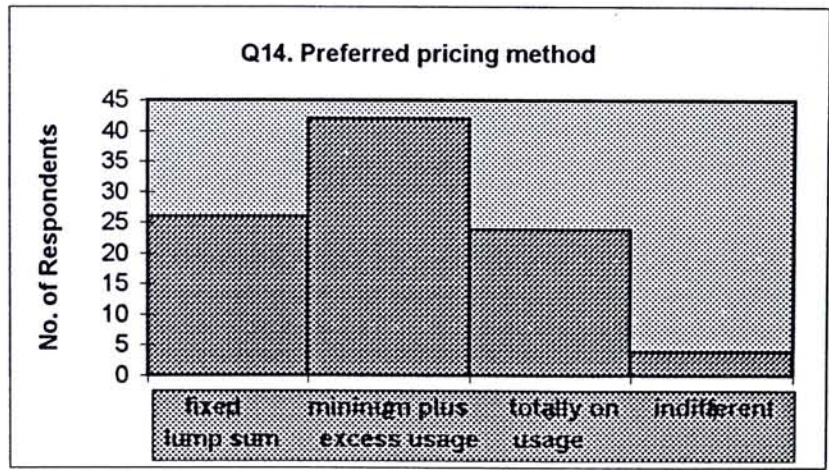
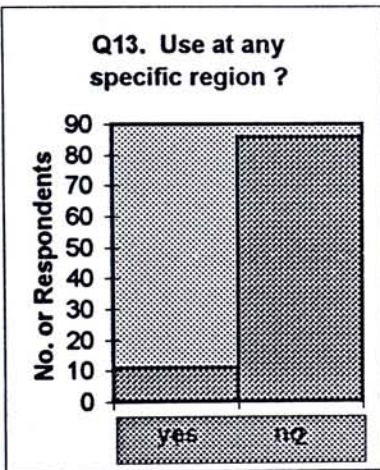
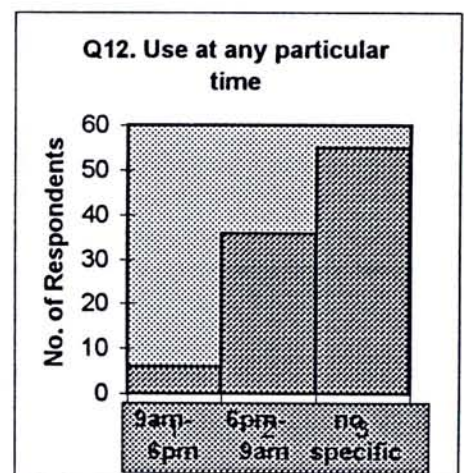
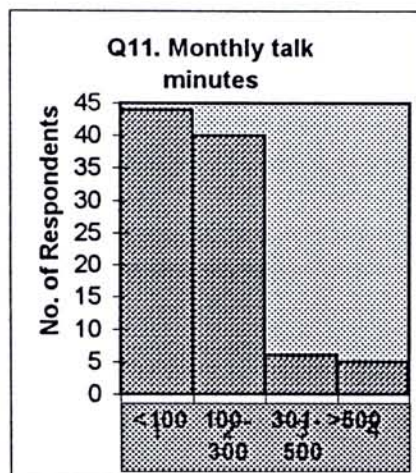
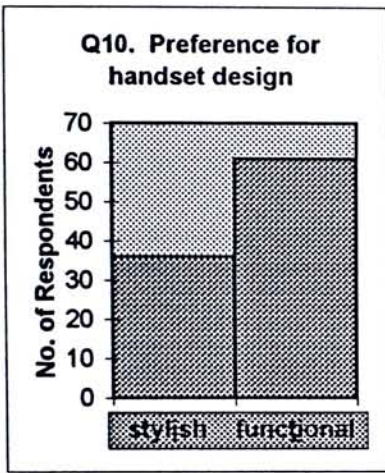
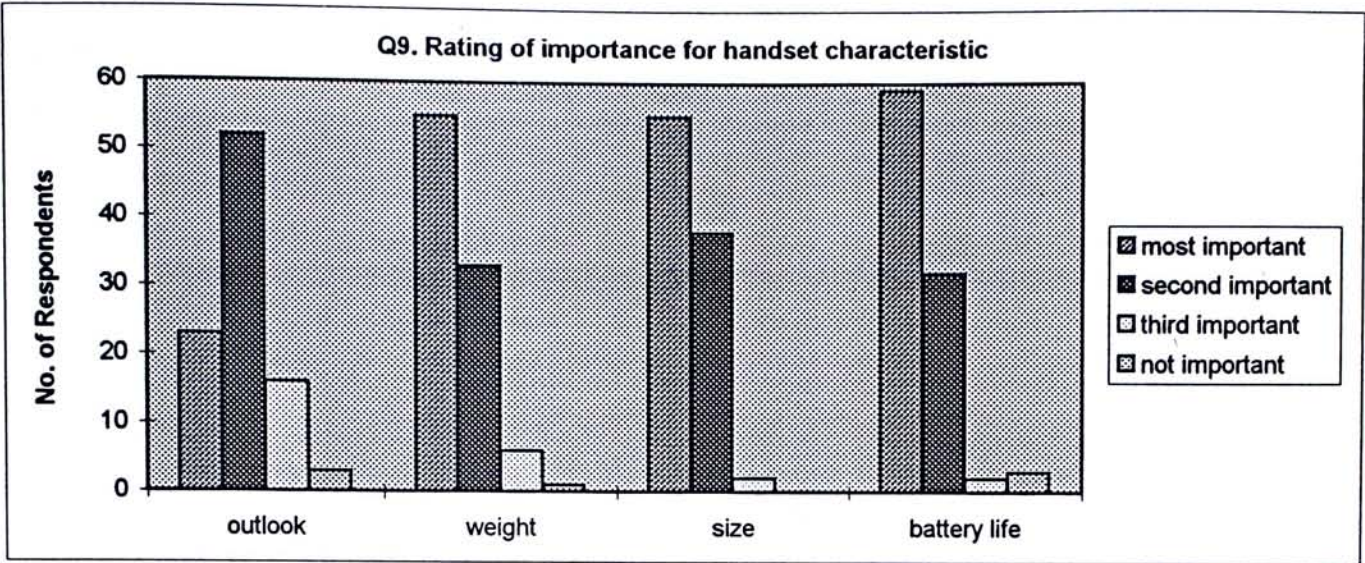
Q3a - People can always reach me at home or in the .....office  
 Q3b - It is too troublesome to carry a phone all the .....time  
 Q3c - I do not want to be reached all the time  
 Q3d - The mobile phone service is too costly at .....present  
 Q3e - Radiation from the phone is hazardous to health  
 Q3f - Others

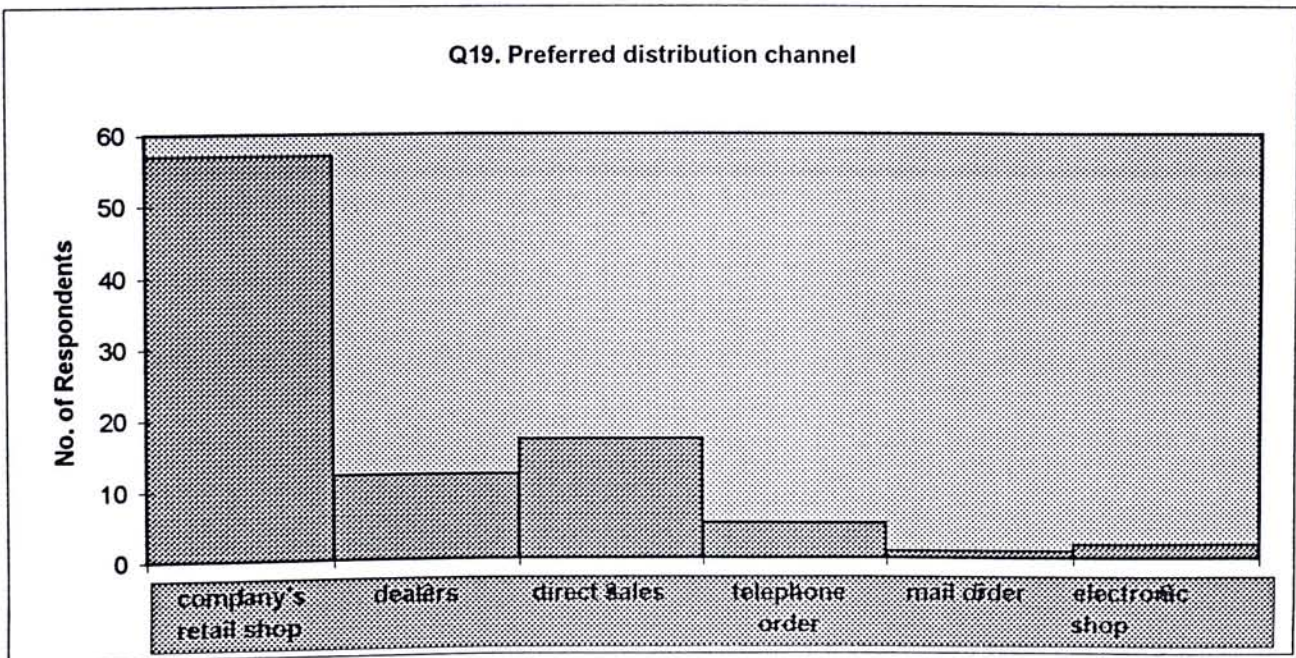
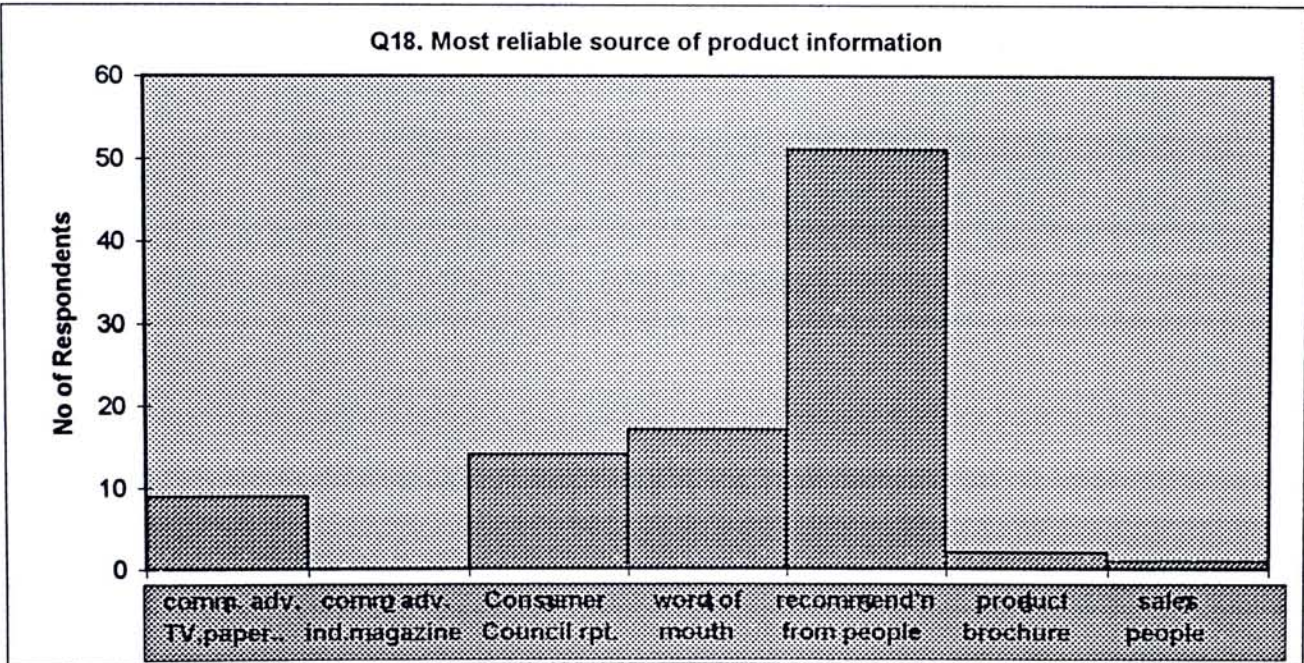
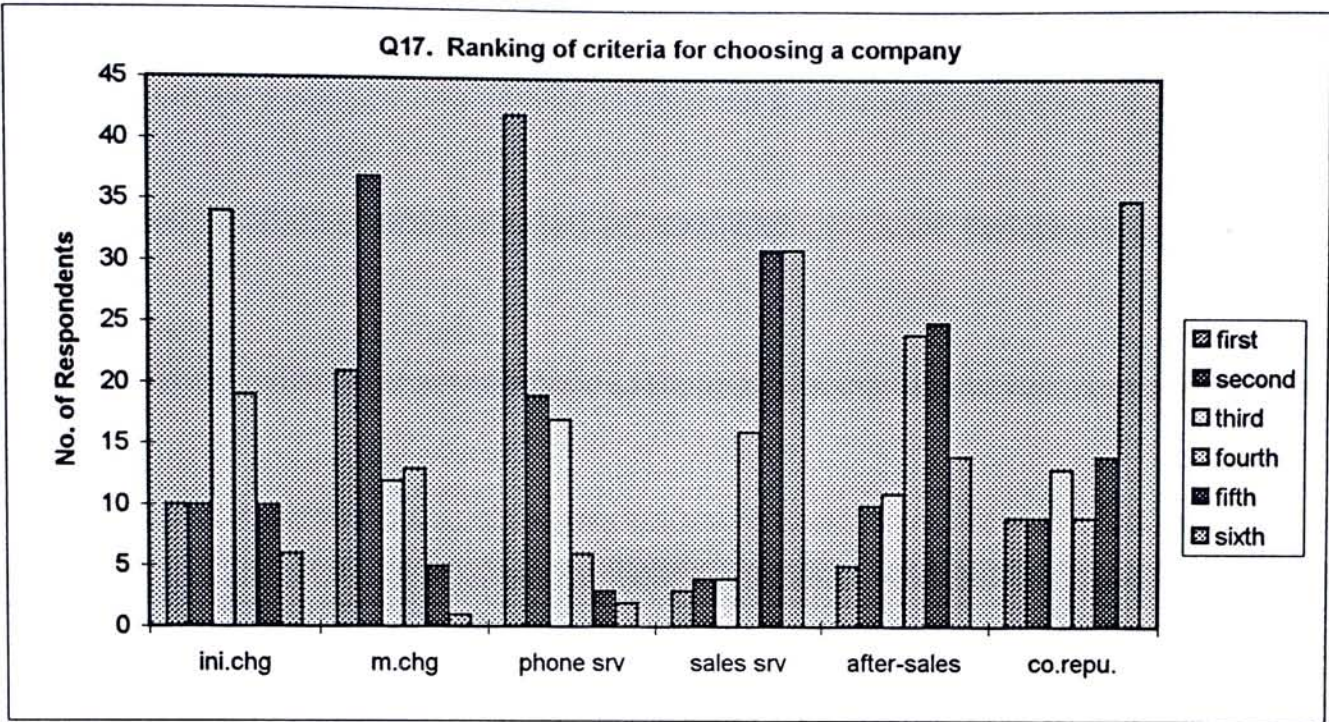
Q4a - Able to call people anywhere anytime  
 Q4b - Allows people to leave messages to me .....anytime when necessary  
 Q4c - Allow people to talk to me directly anytime  
 Q4d - Allows people to reach me with the same no., .....disregarding where I live or work  
 Q4e - Allows me to keep up with my peer group who .....has also used the same communication means  
 Q4f - Serves as a status symbol  
 Q4g - None  
 Q4h - Others











## APPENDIX 5

## SELECTED CROSS-TABULATION RESULTS OF MARKET SURVEY

Below is the selected cross-tabulation results of the market survey:

## Distribution of existing service usage

	only CT2	only pager	only mobile phone	only CT2 & pager	only phone & pager	all three services	none
number	1	29	10	1	17	2	50
%	0.91%	26.36%	9.09%	0.91%	15.45%	1.82%	45.45%

	with CT2	with Pager	with mobile phone
number	4	49	29
% of entire population	3.64%	44.55%	26.36%

## Reason not using mobile now, cross-tabulating with age groups

	already can be reached	troublesome	not want to be reached	too costly	hazardous to health
15-19	57.89	31.58	15.79	68.42	15.79
20-24	70.00	10.00	10.00	30.00	0.00
25-29	66.67	13.33	13.33	46.67	0.00
30-34	72.22	38.89	27.78	27.78	0.00
35-39	72.73	36.36	18.18	63.64	18.18
40-44	42.86	14.29	14.29	71.43	14.29

## Desirability of an additional home telephone line, cross-tabulating with age groups

Age	Necessary	Nice to have	No need
15-19	33.33%	52.38%	14.29%
20-24	27.27%	63.64%	9.09%
25-29	11.54%	53.85%	34.62%
30-34	10.34%	55.17%	34.48%
35-39	7.69%	38.46%	53.85%
40-44	10.00%	30.00%	60.00%

## Desirability of an additional home telephone line, cross-tabulating with household size

Household Size	Necessary	Nice to have	No need
1	0.00%	25.00%	75.00%
2-3	9.52%	54.76%	35.71%
4-5	20.00%	52.50%	27.50%
> 5	25.00%	45.83%	29.17%

## Desirability of an additional home telephone line, cross-tabulating with sex groups

Sex	Necessary	Nice to have	No need
Male	19.05%	52.38%	28.57%
Female	12.77%	48.94%	38.30%

## Desirability of an additional home telephone line, cross-tabulating with personal income groups

Personal income	Necessary	Nice to have	No need
<\$10000	25.00%	53.57%	21.43%
\$10001-\$20000	21.21%	51.52%	27.27%
\$20001-\$30000	6.67%	33.33%	60.00%
\$30001-\$40000	14.29%	57.14%	28.57%
>\$40000	7.14%	35.71%	54.14%

Desirability of an additional home telephone line, cross-tabulating with household income groups

Personal Income	Necessary	Nice to have	No need
<\$10000	25.00%	58.33%	16.67%
\$10001-\$30000	24.00%	32.00%	44.00%
\$30001-\$50000	20.00%	51.43%	28.57%
\$50001-\$70000	6.67%	53.33%	40.00%
>\$70000	5.88%	52.94%	41.18%

Desirability of mobility for the additional home telephone line, cross-tabulating with education groups

Education	Necessary	Nice to have	Not care	No need
< Secondary	0.00%	0.00%	33.33%	66.67%
Secondary	13.64%	38.64%	15.91%	31.82%
Tertiary or above	19.05%	57.14%	9.52%	14.29%

Desirability of mobility for the additional home telephone line, cross-tabulating with age groups

Age	Necessary	Nice to have	Not care	No need
15-19	23.81%	33.33%	23.81%	19.05%
20-24	18.18%	63.64%	0.00%	18.18%
25-29	23.08%	46.15%	15.38%	15.38%
30-34	13.79%	55.17%	10.34%	20.69%
35-39	7.69%	46.15%	7.69%	38.46%
40-44	0.00%	0.00%	20.00%	80.00%

Desirability of mobility for the additional home telephone line, cross-tabulating with sex groups

Sex	Necessary	Nice to have	Not care	No need
Male	14.29%	53.97%	12.70%	19.05%
Female	19.15%	40.43%	12.77%	27.66%

Desirability of mobility for the additional home telephone line, cross-tabulating with personal income groups

Personal Income	Necessary	Nice to have	Not care	No need
<\$10000	14.29%	39.29%	21.43%	25.00%
\$10001-\$20000	15.15%	54.55%	9.09%	21.21%
\$20001-\$30000	13.33%	40.00%	13.33%	33.33%
\$30001-\$40000	28.57%	57.14%	7.14%	7.14%
>\$40000	7.14%	50.00%	14.29%	28.57%

Desirability of mobility for the additional home telephone line, cross-tabulating with household income groups

Personal Income	Necessary	Nice to have	Not care	No need
<\$10000	16.67%	50.00%	16.67%	16.67%
\$10001-\$30000	24.00%	28.00%	16.00%	32.00%
\$30001-\$50000	14.29%	48.57%	8.57%	28.57%
\$50001-\$70000	13.33%	60.00%	13.33%	13.33%
>\$70000	11.76%	52.94%	17.65%	17.65%

Ranking of factors of considerations for subscribing to the mobile phone service, cross-tabulating with age groups

Factors of Considerations	15-19	20-24	25-29	30-34	35-39	40-44
phone services	1	1	1	2	2	1
handset characteristics	4	4	4	4	4	4
handset price	3	3	3	3	3	2
service charge	2	2	2	1	1	3

Ranking of factors of considerations for subscribing to the mobile phone service, cross-tabulating with sex groups

Factors of Consideration	Male	Female
phone services	1	1
handset characteristics	4	4
handset price	3	3
service charge	2	2

## Rating of phone service, cross-tabulating with sex groups

	Male	Female
Clear voice quality	1	1
Can use anywhere in the territory	1	1
Can use in underground areas	2	2
Can use in a moving vehicle	1	2
Will not encounter busy network	2	1-2
Would not have the call dropped while communicating	1	1
Privacy - your message could not be heard by a third party	1	1

## Rating of phone service, cross-tabulating with age groups

	15-19	20-24	25-29	30-34	35-39	40-44
Clear voice quality	1	2	2	1	1	1
Can use anywhere in the territory	1	1	1	1-2	1	1
Can use in underground areas	1	1	2	2	2-3	3
Can use in a moving vehicle	1	1-2	1	2	1-2	1
Will not encounter busy network	1	1-2	1-2	2	1	1
Would not have the call dropped while communicating	1	1	1	1	1-2	1
Privacy - your message could not be heard by a third party	1	1	1	1	1-2	1

## Rating of phone service, cross-tabulating with personal income groups

	<\$10K	\$10-20K	\$20-30K	\$30-40K	>\$40K
Clear voice quality	1	1-2	1	1-2	1
Can use anywhere in the territory	1	1	2	1	1
Can use in underground areas	1	2	3	2	1-2
Can use in a moving vehicle	1-2	1-2	2	1	1
Will not encounter busy network	2	2	2	2	1
Would not have the call dropped while communicating	1	1	1	1	1
Privacy - your message could not be heard by a third party	1	1	2	1	1

## Rating of phone service, cross-tabulating with household income groups

	<\$10K	\$10-30K	\$30-50K	\$50-70K	>\$70K
Clear voice quality	1	1-2	1	1-2	1
Can use anywhere in the territory	1	1-2	1-2	1-2	1
Can use in underground areas	1	1-3	2	2	2
Can use in a moving vehicle	1	2	1	1-2	1-2
Will not encounter busy network	1-3	2	2	1-2	1
Would not have the call dropped while communicating	1-2	1-2	1	1-2	1
Privacy - your message could not be heard by a third party	1	1	1	1	1

## Rating of phone service, cross-tabulating with education groups

	< Secondary	Secondary	>= Tertiary
Clear voice quality	1	1	1
Can use anywhere in the territory	1	1-2	1
Can use in underground areas	3	1-2	2
Can use in a moving vehicle	1	2	1
Will not encounter busy network	1	2	1-2
Would not have the call dropped while communicating	1	1-2	1
Privacy - your message could not be heard by a third party	1	1	1

## Rating of handset characteristics, cross-tabulating with age groups

	15-19	20-24	25-29	30-34	35-39	40-44
Overall physical outlook	2	1	2	2	2	3
Weight	1	1	1	1	1	1
Size	1	1	1	1-2	2	1
Battery Life	1	1	1	1-2	1	1

## Rating of handset characteristics, cross-tabulating with sex groups

	Male	Female
Overall physical outlook	2	2
Weight	1	1
Size	1	1
Battery Life	1	1

## Rating of handset characteristics, cross-tabulating with personal income groups

	<\$10K	\$10-20K	\$20-30K	\$30-40K	>\$40K
Overall physical outlook	2	2	1	2	2
Weight	1	2	1	1	1
Size	1	2	1	2	1
Battery Life	1	1	1	2	1



Rating of handset characteristics, cross-tabulating with household income groups

	<\$10K	\$10-30K	\$30-50K	\$50-70K	>\$70K
Overall physical outlook	2	1-2	2	2	2
Weight	1	1	1	1-2	1
Size	1	1	1-2	1-2	1-2
Battery Life	1	1	1	1	2

Rating of handset characteristics, cross-tabulating with education groups

	< Secondary	Secondary	>= Tertiary
Overall physical outlook	2	2	2
Weight	1	1	1
Size	2	1	1
Battery Life	1	1	1

Rating of handset design, cross-tabulating with age groups

Age	Stylish	Functional
15-19	20.00%	80.00%
20-24	63.64%	36.36%
25-29	34.78%	65.22%
30-34	44.00%	56.00%
35-39	45.45%	54.54%
40-44	0.00%	0.00%

Rating of handset design, cross-tabulating with sex groups

Sex	Stylish	Functional
Male	35.71%	64.29%
Female	37.50%	62.50%

Airtime usage, cross-tabulating with age groups

Age	<100	100-300	301-500	>500
15-19	21.05%	42.11%	15.79%	21.05%
20-24	30.00%	60.00%	10.00%	0.00%
25-29	47.83%	43.78%	4.35%	4.35%
30-34	52.00%	44.00%	4.00%	0.00%
35-39	72.73%	27.27%	0.00%	0.00%
40-44	100.00%	0.00%	0.00%	0.00%

Airtime usage, cross-tabulating with user/nonuser of mobile phones

Age	<100	100-300	301-500	>500
user	46.43%	39.29%	10.71%	3.57%
nonuser	46.27%	43.28%	4.48%	5.97%

When to use the service, cross-tabulating with user/nonuser of mobile phones

	business hour	non business hour	no preference
user	7.14%	42.86%	50.00%
nonuser	5.97%	34.33%	59.70%

Where to use the service, cross-tabulating with user/nonuser of mobile phones

	specific region	no preference
user	17.86%	82.14%
nonuser	8.96%	91.04%

Pricing scheme preference, cross-tabulating with age groups

Age	lump-sum	monthly+usage	usage only	indifferent
15-19	38.89%	27.78%	27.78%	5.56%
20-24	20.00%	70.00%	10.00%	0.00%
25-29	34.78%	47.83%	8.70%	8.70%
30-34	28.00%	40.00%	28.00%	4.00%
35-39	9.09%	45.46%	45.45%	0.00%
40-44	25.00%	0.00%	75.00%	0.00%

Pricing scheme preference, cross-tabulating with household size

	lump-sum	monthly+usage	usage only	indifferent
1	0.00%	0.00%	100.00%	0.00%
2-3	10.81%	54.05%	29.73%	5.41%
4-5	40.00%	34.29%	22.86%	2.86%
> 5	40.00%	45.00%	10.00%	5.00%

## Pricing scheme preference, cross-tabulating with user/nonuser of mobile phones

	lump-sum	inmonthly+usage	usage only	indifferent
user	24.00%	60.00%	16.00%	0.00%
nonuser	30.77%	40.00%	29.33%	0.00%

## Maximum charge for phone service, cross-tabulating with age groups

	<\$200	\$201-\$400	\$401-\$600	\$601-800	\$801-\$1000	>\$1000
15-19	21.05%	36.84%	26.32%	15.79%	0.00%	0.00%
20-24	11.11%	44.44%	44.44%	0.00%	11.11%	0.00%
25-29	15.79%	52.63%	21.05%	10.53%	15.79%	5.26%
30-34	20.83%	41.67%	33.33%	4.17%	4.17%	0.00%
35-39	36.36%	36.36%	37.27%	0.00%	0.00%	0.00%
40-44	14.29%	28.57%	42.86%	14.29%	0.00%	0.00%

## Maximum charge for phone service, cross-tabulating with user/nonuser of mobile phones

	<\$200	\$201-\$400	\$401-\$600	\$601-800	\$801-\$1000	>\$1000
user	10.71%	17.86%	42.86%	7.14%	17.86%	3.57%
nonuser	22.39%	47.76%	22.39%	7.46%	0.00%	0.00%

## Maximum handset price, cross-tabulating with age groups

	<\$1000	\$1001-2000	\$2001-3000	\$3001-4000	>\$4000
15-19	36.84%	26.32%	31.58%	5.26%	0.00%
20-24	22.22%	22.22%	22.22%	33.33%	11.11%
25-29	13.64%	54.55%	22.73%	9.09%	4.55%
30-34	34.78%	26.09%	21.74%	17.39%	8.70%
35-39	45.45%	54.55%	0.00%	0.00%	0.00%
40-44	28.57%	14.29%	28.57%	28.57%	0.00%

## Maximum handset price, cross-tabulating with user/nonuser of mobile phones

	<\$1000	\$1001-2000	\$2001-3000	\$3001-4000	>\$4000
user	28.00%	12.00%	32.00%	28.00%	12.00%
nonuser	30.30%	43.94%	18.18%	7.58%	1.52%

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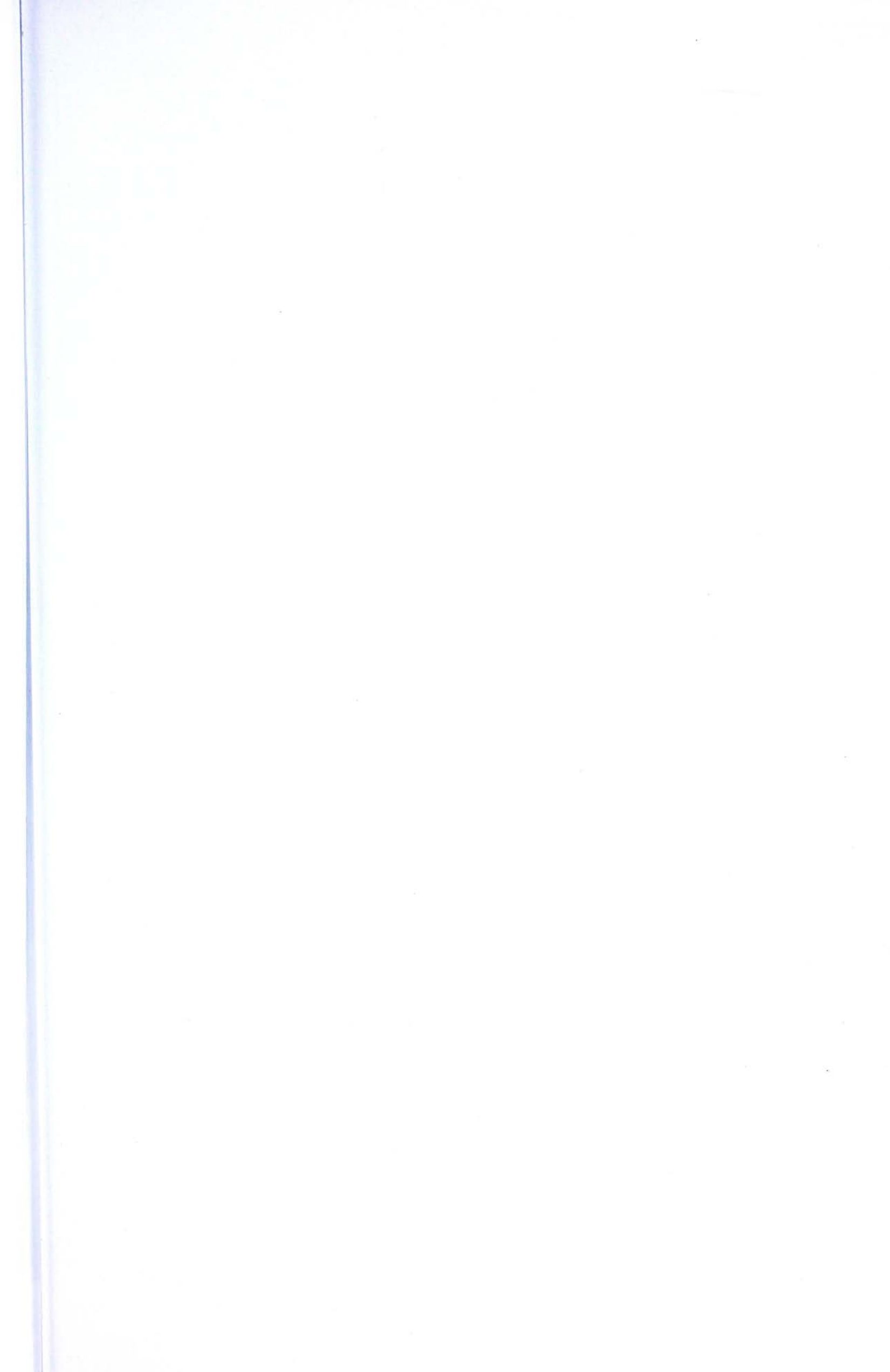
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