Paging Industry in Japanese Mobile Communication Market

by

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Submitted to the Sloan School of Management
in Partial Fulfillment of
the Requirements of the Degree of
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OF TECHNOLOGY

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ABSTRACT

This paper intends to formulate different strategic action programs for competitors in the Japanese paging industry. NTT DoCoMo, Tokyo Telemessage, NEC, Matsushita, Casio, Motorola, and Sharp are picked up as the cases in point. NTT DoCoMo and Tokyo Telemessage are paging carriers while NEC, Matsushita, Casio, Motorola, and Sharp are device manufacturers. The paging carriers and the device manufacturers have cooperatively sustained the growth of the paging industry. In face of a growth opportunity in non-voice communications as well as a threat of substitution from PHS, however, business scope of each competitor has started to differentiate.

Through interviews and information available to the public, this study investigates external factors that affect the industry attractiveness and internal factors that affect the competitive position in the industry. These factors are then integrated to formulate strategic recommendations. The Arnoldo C. Hax and Nicolas S. Majluf method effectively identified factors that affect opportunities and threats for the industry attractiveness as well as strengths and weaknesses of each competitor. Three generic competitive strategies, which are cost leadership, differentiation, and focus, effectively supported strategic recommendations which reinforce the strengths and neutralize the weaknesses of each competitor.

Partnerships between the paging careers and the device manufacturers are identified as one of the significant factors which affect strategic action programs.

Thesis Supervisor: Arnoldo C. Hax

Title: Alfred P. Sloan Professor of Management
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Finally, we would like to dedicate this thesis to our families with our sincere appreciation.

To my wife, Yoshiko, and two daughters, Chika and Risa:
    Thank you all for your patience, understanding, and support.

                         Akira

To my families, Mieko and Yuzuki:
    Thank you very much for your patience, encouragement, and support.

                         Takashi

To my mother, Miyoko:
    Thanks for all your understanding and patience.

                         Yukiko

Thanks to their support and patience, we could make our life at Sloan very fruitful one.
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Chapter 1

Introduction

1.1 Objectives of This Thesis

"Total sales of the mobile communication industry will become ¥15.7 trillion, or $157 billion, in 2010." On April 10, 1995, the Ministry of Posts and Telecommunications in Japan announced its forecast on the growth of the mobile communications market. It predicted almost ten times growths from the ¥1.7 trillion total sales in fiscal 1994.

The number of the paging service subscribers reached 10 million in July 1995. This was nearly the one-tenth of Japanese population. The number of the cellular service subscribers also reached 10 million in March 1996. It has increased from 4 million to 10 million in just one year. PHS service, which started in July 1995, attracted 1.5 million subscribers only in nine months. This is the most rapid growth that Japanese industries have ever experienced.

On May 19, 1995, MPT permitted the introduction of the high-speed paging system. This system is about ten times faster than the old slowest one. This permission aimed to increase the capacity of the paging system that has grown around 20% a year. At the same time, this high-speed paging system has a great potential to grow into the area of non-voice communications. The length of messages will become much longer than current one. This will attract many young users who prefer a non-voice communication to a voice communication. This high-speed also enables the paging system to transmit over 1,000 stock prices, money market and foreign exchange information, weather forecast, sport scores, and news headlines. This will completely transform pagers from beepers to non-voice message devices.

In this paper, we focus on the paging industry and formulate recommendations to each competitor in the paging industry. We first analyze evolving competition in the mobile communications market. Next, we identify environmental opportunities and threats for the
paging industry. Then, we examine internal factors that affect the competition in the industry. Finally, we formulate strategic recommendations for each competitor to capture this growth opportunity.

1-2 Methodology for the Identification of a Business Strategy

The methodology for business strategic planning developed by Arnoldo C. Hax and Nicolas S. Majluf is a very powerful tool which helps us not only to formulate a sound strategy, but also to achieve a common understanding and commitment to business objectives as shown in Figure 1-1.

Here we are adhering to Hax and Majluf’s methodology as shown in Figure 1-2. In Part I, we examine the current outline of the Japanese mobile communications industry, the Paging, Cellular, and PHS industries as well as those of other mobile devices. In Part II, we go through the environmental scan using external factor analysis and five-force analysis in order to identify opportunities for and threats to the paging industry. In Part III, we perform internal scrutiny in order to assess the core competence of individual companies, using the value chain. In Part IV, we make mid-term strategic recommendations for the paging industry.
Figure 1-1  The Fundamental Elements in the Definition of a Business Strategy

The Mission of the Business
- Definition of business scope: products, markets, and geographics
- Identification of unique competencies

Environmental Scan at the Business Level
(Past performance and future projections)
- Identification of external factors contributing to industry attractiveness
- Overall assessment of industry attractiveness

Identification of opportunities and threats

Internal Scrutiny at the Business Level
(Past performance and future projections)
- Identification of internal critical factors to achieve competitive advantage
- Overall assessment of competitive position

Definition of basic strengths and weaknesses

Formulation of the Business Strategy
A set of multiyear broad action programs

Strategic Programming
Definition and evaluation of specific action programs (covering 6- to 18-months)

Budgeting
Strategic funds programming and operational budgets

Figure 1-2 Our methodology to comprehend the Japanese mobile communications market and to formulate a strategic recommendation

Outline of Japanese mobile communication market

- Definition of business scope
- Current overview: Paging (including Visual information Radio), Cellular, PHS, and potential entrants (Electronic Organizer and PDA)
- Identification of critical issues

Internal Scrutiny

(Past performance and future projections)

- Definition of business scope of individual companies: products, markets, and geographics
- Identification of internal critical factors to achieve core competence in the value chain: management, technology, and marketing
- Overall assessment of competitive position

Definition of basic strengths and weaknesses

Environmental Scan

(Past performance and future projections)

- Identification of external factors contributing to industry attractiveness
- Overall assessment of industry attractiveness
- Five forces analysis

Identification of opportunities and threats

Formulation of the Strategic recommendation

A set of multiyear broad action programs
PART I

Outline of the Japanese Mobile Communications Market

Chapter 2

Current Overview of the Japanese Mobile Communications Market

The objective of this chapter is to examine the Japanese mobile communications market and to position the paging industry within this market.

2.1 Scope of the Analysis

The Japanese mobile communications market consists of a Paging industry and a Mobile phone industry. In the mobile phone industry, in which there were only car and cellular carriers and device firms, personal handy phone (PHS) carriers and device firms have appeared July 1995. These two newcomers are not yet differentiated. PDA and the Electronic Organizer industry is a potential entrant for the whole Japanese mobile communications market, and visual information radio is a potential entrant for the Paging industry, as shown in Figure 2-1.
Previously, the paging industry was thought to be a single industry, but it is now necessary to see paging carriers and paging device firms as separate sub-industries of the paging industry. The same can be said of the mobile phone industry; cellular carriers, cellular device firms, PHS carriers, and PHS device firms.

We will briefly cover the following issues in each industry and the potential entrants: History, Market Size, Competitors, Service Offering, Pricing, Market Growth, Customers, and Financial Data.
2-2 The Paging Industry

Paging

History
NTT began its paging service in 1968, a service known as “pocket bell” in Japanese. NTT was a carrier and a device provider at the same time. NTT bought devices from the device manufacturers and leased them to the subscribers under the brand name of NTT.

In 1987, following the 1985 privatization of NTT, the paging market was deregulated. NTT DoCoMo was founded in 1991 and was separated into 9 regional companies in 1993.1 Thirty-one new common carriers (NCC) were established regionally between 1987 and 1991. Each prefecture now has at most 2 competitors, one is from the NTT DoCoMo group and another is from the NCC group.2

In spring 1995, the device sales were introduced. Prior to this, users could only rent a paging device from carriers, but users can now select either to buy or to rent one without restrictions.

In spring 1996, each carrier will start a FLEX-TD service. NTT DoCoMo called it ‘Next Service.’ Through this high-speed service, the quantity of messages increased, and new services were available, like the holding of messages until they were received. Because FLEX-TD is a unified system, customers can select their favorite device, and then select a carrier. This created fierce competition between the two carrier groups.3,4

Market size
As of March 1996, there were 10,610,549 total subscribers, representing 8.6% of the Japanese population. 6,323,887 (59.6%) are with the NTT DoCoMo group, and 4,286,662 (40.4%) are with the NCC group, as illustrated in Figure 2-2.
Growth
As shown in Figure 2-3, the number of subscribers has increased at a high rate, approximately 15-20% per year. Beginning in 1987, the NCC group gradually gained a share, and the competition between the NTT DoCoMo group and the NCC group accelerated a decrease in prices. NCC's strategy for focusing on young personal users (those under 30) expanded the market size by attracting new customers.²

On the other hand, other factors restrained market growth. First, the substitute mobile phone industry, Cellular and PHS, could compete with paging. PHS started its service with the device sales in April 1995. Cellular decreased its service fee to attract more subscribers, and primarily to attract potential customers from PHS. Furthermore, Cellular was allowed to introduce device sales in 1994.
Secondly, there is a capacity problem because a limited radio frequency has been assigned to paging, and subscriber usage has changed as younger subscribers have grown in number. In some cases, carriers should have stopped accepting new subscribers because of system overflow. ²

The FLEX-TD system was expected to solve these problems. It is the next generation of Japanese standard paging protocol based on Motorola’s FLEX coding system and NTT DoCoMo’s elemental technology. TD stands for Time Diversity. FLEX itself is a high speed paging protocol which provides more than five times the messaging capacity of previously existing protocols, establishing a base for additional value-added messaging services. The TD improves battery life and reliability, but it has twice the current system capacity of NTT DoCoMo’s TD and has required a huge investment of more than ¥ 1 billion. ⁴
Competitors

Carriers:
The NTT DoCoMo group consists of 9 companies and the NCC group consists of 31 companies. In a single region, one NTT DoCoMo and one NCC company compete with each other, or there is only NTT DoCoMo. Accordingly their pricing competition pricing has not been problematic because of this duopoly.

Device Manufacturers:
NEC, Matsushita, Casio, Sharp, Kokusai, Toyo, Toshiba, and Motorola are all manufacturing paging devices.

Each device firm’s market share with each carrier has changed over time. NEC, Kokusai, Toshiba, Toyo, Matsushita, and Motorola have shipped to NTT DoCoMo, and recently Casio began trading with NTT DoCoMo. NEC, Oi (which is a subsidiary company of Mitsubishi Co., Ltd.), Casio, TOA, Toshiba, Matsushita, and Motorola are supplying
devices to the NCC group, and their shares have changed rapidly under the NCC group’s strict device model selection.  

Strategic distinctions have created these differences. NTT DoCoMo’s group runs the NTT system and the NCC group runs the POGSAG system. These two recent systems match up with very different devices. Therefore, device development is different between the two groups. NTT DoCoMo adopts several manufacturers and develops devices closely with those manufacturers. NCC just wants to pick the best devices from manufacturer proposals to attract more customers. Consequently, the device manufacturers’ shares with the NCC group have varied enormously over time. Casio is a good example of this. Casio polished its R&D skill with NCC and then began selling its popular devices to NTT DoCoMo. The market has become so intense that NTT DoCoMo could not help but do business with Casio. 

By the time the unified FLEX-TD system was introduced, device sales system were already in operation, and this pattern is now changing. Device firms can sell devices to carriers and to users for less. Users can now select a device and then a carrier with a FLEX-TD system.

Service offerings
There are four different ways of sending messages; by Tone Pager (TP), by Numeric Pager (NP since 1987), by Free-Word (since 1991), and by Information Pager (IP). Free-Word and IP can display characters, katakana, or the alphabet. The difference between Free-Word and IP is the way of the device or system produces character display. The Free-Word device has a function that translates numbers into characters, and the IP system sends characters from its base stations. As of March 1995, there were 1,600,000 (17%) TP subscribers, 7,750,000(83%) NP subscribers, and 5,000(0.05%) Free-word and IP subscribers.

NTT DoCoMo offers a service with 12 or 24 figures, and NCC offers 12 - 20 figures in its display. Some NCCs in rural areas have begun a 40-figure service, with a special charge.
As for speed, at the beginning it was 512 kbps; then, in 1990, it increased to 1200 kbps. After FLEX-TD, 1600 kbps, 3200 kbps, and 6400 kbps became available.  

Pricing
There are several cost systems, e.g., Initial Cost (Deposit, Contract Charge) and Monthly Charge (Tariff, Usage fee). The deposit is returned when the rental device is returned.

As for TP, on an average, the local monthly fee is ¥1500, the wide-area monthly fee is ¥1800, and the monthly rental fee is ¥300. As for NP, the fees are ¥1800, ¥2200, and ¥400 respectively. As for IP, the fees are ¥3600, ¥4600, and ¥700 respectively. The contract charge for any pager is ¥2,700.]

Under the device sales, a device costs from ¥6,500 to ¥17,000.

The NCC group always prices a little lower than the NTT DoCoMo group does. As for the FLEX-TD service, a device price is ¥12,000. For the first time, a graduated charge system was introduced by NTT DoCoMo. In this pricing system, for every 50 receiving times above 200 per month, ¥300 is charged.

**Figure 2-5 Paging Pricing**

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*Source: NTT DoCoMo Home Page - Web, April 1996*
Customers

Customers mainly have shifted from business to personal since around 1990. 80% of new subscribers are personal users, where as only 10-20% of older subscribers are personal users. 15.0% of all households have a pager. This is illustrated in Figure 2-6.

Another trend is that young people in their teens and twenties and female customers have increased with the price decrease. 60% of female customers are under twenty. NTT DoCoMo gained 1.4 million new subscribers in 1993, partly because they reduced the initial deposit from ¥15,000 to ¥5,000. In 1995, 80% of new subscribers to Tokyo Telemessage were high school students.5

Figure 2-6  Percent of Pagers Used for Business


But these young users have brought the following three problems, resulting in inventory losses: First, 80% of young subscribers cancel or do not renew their contracts, and their
contract term is typically very short. Carriers can not collect device costs with less than a one year rental term. Secondly, they frequently change device models when new models are launched. This means that carriers have to retain rent-backed models as inventory. Thirdly, a high proportion of young users fails to pay monthly charges. While deposit the compensates for arrears, devices tend not to be returned to the carriers.\(^5\)

Moreover carriers have to hold these old-contract circuits vacant for 6 months to clean up usage. This has accelerated the lack of radio frequencies. In addition, because most subscribers make use of maximum figures, there is a peak time for business use (11:00 and 15:00-16:00) and a peak time for personal use (23:00 - 24:00). Moreover, these users send data up to the limit as much as 10 times a day. These subscriber habits create carrier capacity problems.\(^2\)

After the device sales were introduced, the ratio of rentals to purchases seemed to be 4 to 1 in 1995.

**Financial data**

As shown in Figure 2-7, gross sales were ¥273 billion in 1994, 24.9\% up from the previous year. NTT DoCoMo group's sales were ¥168,881 million, and the Telemesage group's were ¥104,457 million.\(^7\)
The total profit of the NTT DoCoMo group was 4.1%, ranging from 8.5% at NTT DoCoMo Kyusyu to 2.6% at NTT DoCoMo, Chuo. The total profit of the NCC group was 13.1%, ranging from 2.0% at Telemessage Yamaguchi to 33.0% at Paging Service, Toyama.8

Visual Information Radio

History
The Visual Information Radio service is provided by FM carriers. In April 1995, the Japan FM Network (JFN) started the service, and J-Wave started one in autumn, 1995. In March 1996, the NHK FM radio section also started a service. One of the main reasons for offering this service was to improve the value of FM programs and/or to add a new concept to FM programs.9
FM stations will start an FM pager service in fall, 1996, but it seems that there are several functional problems to be solved.

The JFN group founded FM Communications, Inc. in August 1995, targeting the improvement of FM programs and positioning a visual part as a supplement to sound. As for program sponsorship, they have not yet decided whether or not to have the same sponsors on both the audio and the visual parts of program.

In October 1995, the current DARC system was recognized as a world-wide standard at the ITU-R conference. This DARC technology was developed by the NHK Research Center as an FM multi-letter broadcasting methods.  

**Market size**
Four hundred thousand devices have been shipped out as of March, 1996.

**Growth**
They expect to have 10 million users by 2000.  

**Competitors**
As for carriers, JFN(34 stations), J-wave, and NHK exist as of 1996.  
As for device firms, Casio, Panasonic, Sony, and Sharp are now in business.

**Service offering**
Recently Tokyo FM has 5 channels, e.g., its own program information, news, business & sports, weather, traffic information, and fortune telling.  
Tokyo FM will begin an FM paging service and a two-way radio program in the fall of 1996.  

Visual information radio can stock received information.

**Customers**
The main customers are personal users in their teens and twenties.
2.3 The Mobile Phone Industry

The Mobile phone industry has Cellular and PHS, and each consists of carriers and device
firms. PHS was just launched in April, 1995, and has not yet differentiated its functions
from those of Cellular. The device sales have become normal among new subscribers
in the mobile phone industry.

Cellular

History
There are two big issues related to the Japanese Cellular industry. One was
telecommunications deregulation and the other was a trading battle with USTR (Office of
United States Trade Representative) over the law of ‘Super 301.’

NTT started its cellular service in Tokyo in November, 1979. This was for cellular car
phones in the beginning. NTT then expanded its service to Osaka, the Tokyo Metropolitan
Area, and eventually to all of Japan, but this diffusion was limited because car phone
devices were too big to carry around and service charges were too high.\textsuperscript{11}

In 1985, the deregulation of the Japanese telecommunications market began. NTT was
privatized and new common carriers entered the telecommunications business.\textsuperscript{11}

In 1988, the IDO group started its cellular car phone business in the Tokyo Metropolitan
Area with NTT’s system. In 1989 Cellular group began its service in Osaka with the
TACS system and expanded its service to all of Japan. Competition accelerated price
decreases, and the devices became more handy. Also, subscribers increased enormously.\textsuperscript{11}

The crux of the dispute over cellular phones with USTR was that Japan’s cellular
technology was unique. The United States Government and Motorola complained in the
mid-1980’s that the Japanese standard (NTT system) was intended as a trade barrier. NTT
had a history of going its own way so that it could keep control of its own technology for
itself and its family of Japanese suppliers.\textsuperscript{12}
Around 1987, the Japanese Government agreed to let the American system (TACS system) into the country, but only outside the Tokyo-Nagoya region at first.\textsuperscript{12}

Then, in a 1989 agreement, it allowed the American system into this area, assigning IDO the frequencies. But IDO, which was already building a system using the Japanese standard, failed to build the Motorola system quickly enough. Under the 1994 agreement, IDO was to complete the Motorola system within 18 months.\textsuperscript{12}

No country has two different standards, and most nations would react negatively if an outside supplier tried to force it to adopt a second, incompatible technology. Yet, with the help of the United States Government, Motorola wished to force its own cellular communication system on Japan.\textsuperscript{12}

As for IDO, it has painted itself as the victim, having to shoulder the burden of building two incompatible systems. But in 1989, in return for accepting the task of building a Motorola system, IDO was given three megahertz of scarce frequencies, which will ultimately enable it to take on more customers.\textsuperscript{12}

DDI, which competes with NTT in the cellular business outside the Tokyo-Nagoya region, chose from the start to use Motorola equipment. DDI has about half the cellular phone customers in the areas in which it competes and it has healthy profits. But IDO had only about 30 to 35 percent of the cellular customers in its service area and was essentially unprofitable.\textsuperscript{12}

In 1990 the government decided to introduce the digital system. In March 1993, NTT DoCoMo started an 800 MHz digital service in Tokyo. In 1994, Kansai Cellular and IDO started 800MHz digital services and NTT DoCoMo, Tu-ka Cellular Tokyo, Tokyo Digital Phone, Tu-ka Phone Kansai, Kansai Digital Phone, Toukai Digital Phone, and Tu-ka Cellular Toukai started 1.5 GHz digital service. This meant that 4 companies were competing in the Tokyo, Kansai, and Tokai Areas. The Tu-ka group and the Digital Phone group planned to offer a 1.5 GHz digital service together in other areas.\textsuperscript{11}
In April 1994, the device sales were introduced. In the ordinary telephone industry, this service was already deregulated and customers could enjoy cheaper multi-function devices. On the other hand, cellular devices had to be leased through carriers and monthly device rental fee had to be paid to carriers. Therefore, because of the merits of direct sales and the cheaper-priced device, the device sales appealed to customers.

There is a mechanism, however, that makes device price low, and it is called ‘buy-down.’ It is the result of carriers paying retailers huge amounts of back margin in order to gain new subscribers through retailers. This back margin results in a very low-priced device sale. Carriers can charge expensive air time fees and get huge amounts of revenue later from subscribers even though carriers may lose money with this back margin paid to retailers in the beginning.\textsuperscript{11}

In June 1995, each cellular carrier decreased its initial charge in order to compete with PHS service starting in July 1995.

A PHS carrier can not pay such large amounts of back margin as cellular carriers can because its air time charges are much lower. Cellular market growth depends on whether customers think more of initial costs or running costs when considering the total cost of their service.

In spring 1996, NTT DoCoMo began to advertise the data communication function of its cellular phone.\textsuperscript{13}

\textbf{Market size}
As of March 1996, there were 10,204 thousand subscribers. NTT DoCoMo had 48.4\% of the market share and NCC had 51.6\%, and in May 1995, the whole NCC group got a larger share than the whole NTT DoCoMo group for the first time, as shown in Figures 2-8 and 2-9.
Market Growth

The subscribers increased rapidly with deregulation as shown in Figure 2-8.

**Figure 2-8** Increase of Cellular Subscribers

![Graph showing the increase of cellular subscribers from 1986 to 1996.]

*Source: Dentsu Institute for Human Studies, A Research for Information and Media Society 1996 (Japan: Dentsu Institute for Human Studies, 1996) 140.*

Within one year of 1994, the year of the device sales introduction, the market grew to twice its size and gained 2,200,000 new subscribers. Most new subscribers were businesspeople and college students. Suddenly the four competitors began fighting, and fierce promotions stimulated market growth. The merit of direct sales, the cheaper devices, and the cheaper initial costs appealed to customers. In 1995, this boom continued.
Competitors

Carriers:

The NTT DoCoMo group (9 regional companies) and the IDO group (9 regional companies) had been doing business largely in the analog system. The Cellular group (7 regional companies) started in 1988. In 1994, Tokyo Digital Phone, which is related to Nippon Telecom, and Tu-ka Cellular, which is related to Nissan Motor Co., Ltd., entered the business with digital systems. The Digital Phone group and the Tu-ka Cellular group currently consist of 3 regional companies. The market share of each carrier as of July 1995, is shown in Figure 2-10.
Figure 2-10 Market Share of Each Carrier as of July 1995

In the Tokyo, Kansai, and Toukai Areas, there are 5 competitors. In other areas, there would be 4 competitors when the alliance companies between Digital Phone group and the Tu-ka Phone group entered the market. As of 1995, there were 3 alliance companies.\(^\text{14}\)

*Device manufacturers:*
There were 16 device manufacturers as of 1994.

*Service offerings*
Nowadays, the Japanese Radio Regulatory Law allows for three kinds of analog systems, i.e., the NTT system, the TACS system, and the European system. NTT DoCoMo used NTT's system for all of Japan, but there was Japan-US trade friction in 1989 because IDO used the NTT system in the Tokyo-Nagoya area and a TACS system in other areas. After the trading battle was over, the IDO group began using both NTT and TACS systems in the Tokyo-Nagoya area and only a TACS system in other areas.\(^\text{11}\)
The analog system is now almost full and carriers lead new subscribers to digital systems, which are more efficient and to which other radio frequencies are also assigned. NTT DoCoMo and IDO have tried to set up more base stations to solve the inherent problems of coverage areas that are smaller in the digital system. As of March 1996, 48.3% of all subscribers had digital service.\textsuperscript{15}

**Pricing**
The analog system price is the lowest, the 800MHz one is the second lowest, and the 1.5GHz one is the highest in every respect.

The NCC group prices lower than the NTT DoCoMo group as a whole.\textsuperscript{16} Among the NCC group, the Digital phone group and the Tu-ka Cellular group price lower than the Cellular group and the IDO group, as shown in Figure 2-11.

**Figure 2-11 Cellular Pricing as of December, 1995**

<table>
<thead>
<tr>
<th></th>
<th>Initial Cost</th>
<th></th>
<th>Monthly Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subscriber Fee</td>
<td>Contract Charge</td>
<td>Tariff</td>
</tr>
<tr>
<td>DoCoMo</td>
<td>¥6,000</td>
<td>¥3,000</td>
<td>¥6,800-4,200</td>
</tr>
<tr>
<td>Cellular</td>
<td>¥6,000</td>
<td>¥2,700</td>
<td>¥6,300-4,100</td>
</tr>
<tr>
<td>(IDO)</td>
<td>¥5,400</td>
<td>¥3,300</td>
<td>¥6,300-4,100</td>
</tr>
<tr>
<td>Tu-ka</td>
<td>¥4,800</td>
<td>¥3,700</td>
<td>¥6,200-4,100</td>
</tr>
<tr>
<td>Digital Phone</td>
<td>¥4,800</td>
<td>¥3,700</td>
<td>¥6,200-4,100</td>
</tr>
</tbody>
</table>

*Source: Tel-Bel Magazine, April 1996*

But a new different pricing system has been introduced by each company. For example, IDO has introduced a combination plan with a lower initial cost and higher charges to target younger customers.

As for device price, it costs, for example, from ¥14,900 (desired price ¥66,000) to ¥45,900 (¥80,000) including the initial cost and the cost for a battery maintenance
appliance a special promotion. On the average, analog device cost the most, 800MHz devices are second, and 1.5GHz devices are the lowest, as of March 1996.\(^\text{17}\)

**Customers**

97.7\% of all cellular phone customers had only cellular phones; the rest were Car phone customers as of February 1996.\(^\text{15}\)

**Figure 2-12** Percent of Cellulurs used for Business in 1994

![Pie chart showing percentage of cellular use for business](image)

*Source: Dentsu Institute for Human Studies, A Research for Information and Media Society 1996 (Japan: Dentsu Institute for Human Studies, 1996) 140.*

48.3\% of all subscribers used an analog system but new subscribers have mainly use a digital system. Digital systems will gain a more dominant position.\(^\text{15}\)

Previously, the chief customers were high end users such as company owners, but the 1995 boom in cellular phones was among businesspeople and young college students. In 1996, young female customers also became main customers.
As shown in Figure 2-12, 9% use cellulares only for private use. About 90% use them both for private and business purposes. 36% use more than 80% for business purposes. MPT’s 1995 survey said that 10.6% of all household had cellular phones at home.

Financial data
As shown in Figure 2-13, total sales were ¥873,200 million and increased 43.6% in 1994.7

Figure 2-13 Sales of Cellular Carriers

![Graph showing sales of cellular carriers from 1991 to 1994.](image)


PHS

History
PHS is an abbreviation for Personal Handy Phone System. PHS is a Japanese standard for a portable telephone which uses very low power transmitters operating within a small radius. The handiest are smaller and lighter than conventional cellular phones because only a reduced battery power is required. PHS call charges are significantly lower than those of
Cellular. Relay stations cost as little as $1,000 apiece as opposed to the $2 to $3 million needed for cellular installations.\textsuperscript{18}

The philosophy of PHS was to develop a cordless phone for use not only inside but also outside the home. In Japan, cordless telephones had gained a 54\% share for 5 years after the deregulation of direct telephone terminal sales in 1985.\textsuperscript{18}

In June 1994, MPT decided to launch a PHS service. They divided to divide all Japan into 10 blocks and each block would have at most 3 competitors. In July 1995, NTT Personal and DDI Pocket started service in Tokyo and Sapporo and in October 1995, NTT Personal and DDI Pocket expanded service to all of Japan, and Astel started its service throughout Japan.\textsuperscript{19}

PHS has some problems. People can not communicate with PHS when they are moving rapidly in vehicles. Each service area is small and deals with three persons at the most. Also, PHS can not communicate with cellualrs.\textsuperscript{18}

PHS did not get the customers it anticipated because cellular carriers decreased initial costs, and device prices dropped just before PHS started its service.

One of the best characteristics of PHS is its faster data communication function. Although it delayed standardizing the format of its digital data communication, it will do this in the spring of 1997.\textsuperscript{5}

\textbf{Market size}

As of March 1993, there were 1,508,114 accumulated subscribers. MPT expected to have 12 million PHS users by the year 2000 and about 40 million PHS customers by 2010.

\textbf{Growth}

Area constraints and a small sales back margin have prevented PHS from spreading as rapidly as anticipated.
Competitors

Carriers:
The NTT Personal group consists of 10 regional companies; the DDI Pocket group consists of 9 regional companies; and the Astel group consists of 10 regional groups. Astel is a consortium of 10 companies. The market share of each carrier is shown in Figure 2-14.

Figure 2-14 PHS Subscribers in Japan as of March, 1996


Device Manufacturers:

More device firms exist than paging and cellular firms: Sharp, Matsushita, Sanyo, Mitsubishi, NEC, Oi, Nokia and so on.

Service offerings:

Every PHS carrier uses a common air interface and the same radio frequency, so users can join any carrier with any device and communicate with each other.18
**Pricing**

PHS costs less than Cellular. Contract charges are ¥7,000, monthly charges are ¥2,700, and local fees are ¥40 per three minutes.

In the spring of 1996, device prices decreased with a special promotion to the attract younger generation and to compete with pagers. Usually a device costs from ¥3,800 to ¥24,000 in the direct sales. DDI, however, offered a device for ¥5.¹⁵

**Customers**

Yodobashi Camera, one of the biggest retailers in Tokyo, said that most of its PHS main customers are college students, young businesspersons, and female high school students.

Customers choose mobile phones to reduce expenses because the charges are less. PHS is for sending messages while Cellular is for receiving messages. The PHS usage ratio of sending to receiving is 3 to 1.

PHS carriers tried to sell their service to companies after the data communications standard was set by the government.²⁰

**Financial data**

As for net profits in 1994, (business started in July 1994) NTT DoCoMo’s was ¥439 million, DDI Pocket’s was ¥1,312 million, and Astel’s was ¥706 million. The total revenue of PHS carriers was roughly ¥50 billion.²¹

While PHS has shown strong promise, operators may not see profits as quickly as they had expected. DDI, for instance, originally planned profitability within three years of operation; now, its figuring on five.
2.4 Potential Entrants - the EO/PDA Industry

The portable information terminal is a kind of small computer with a personal information management function, such as an address book, a telephone directory, a memo, a schedule book, or an information-gathering-and-sending function such as a fax or data communication. Here we can deal with Electronic Organizers and PDAs because the possibility of their entering the Japanese mobile communications market is very high.

Electronic Organizer

History
The origin of electronic organizers is the electronic calculator manufactured by Sharp in 1964. The domestic annual demand for electric calculators in Japan is now 15 million units.22

Calculator R&D brought with it the improvement of the battery, the efficient and complex LSI, liquid display, and an automated manufacturing operation. In the late 1980s, the electronic dictionary and the electronic organizer were born. Nowadays, the electronic organizer has become popular even among children and female adults.22

Market size & growth
In 1994, 175,050 thousand were shipped out to domestic market and grossed ¥65,100 million. Since the electric organizer was launched, the price per device has increased. Refer to figure 11.
Figure 2-15 The Japanese Calculator and Electronic Organizer Market


Competitors
Casio and Sharp are device firms.

Service offerings
Electronic organizers have such functions as scheduling, telephone books, world clocks, calculation, memos and so on. Data communication is done through telephones and cellular carriers.

Customers
As a whole, the usage rate increased, and 14.7% of the Japanese population used electronic organizers in 1995, as shown in Figure 2-16.
Figure 2-16 Electronic Organizer Usage Rate


Figure 2-17 Electronic Organizer Usage Rate According To Age

People in their twenties use 19.0%; thirties use 25.5%; forties use 19.9%; fifties use 12.8%; and people over sixty use 5.7%, as shown in Figure 2-17.

Figure 2-18 Electronic Organizer Usage in Japan

<table>
<thead>
<tr>
<th>Question &quot;Are you using an electronic organizer?&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>87%</td>
</tr>
<tr>
<td>13%</td>
</tr>
</tbody>
</table>


13% of all people in Japan use electronic organizers, as shown in Figure 2-18.

In observing this use, we find that most people use electronic organizers for personal needs and tend to buy them themselves, as shown in Figure 2-19.
The electronic organizer is also very popular among children, as shown in Figure 2-20. More than half of all girls over seven have electronic organizer, as shown in Figure 2-21. If one child has an electronic organizer in school, his or her friends all want to have one.
Figure 2-20 Electronic Organizer Ownership among Children in 1994


Figure 2-21 Breakdown of Electronic Organizer Ownership among Children in 1994

PDA (Personal Digital Assistants like Newton, Zaurus, and so on)

History
In 1993, Sharp launched its "Hyper Electronic Management Book", and Toshiba launched "XTEND". These were the first PDAs in Japan. Later "Zaurus" was launched by Sharp in 1993, and this essentially created the Japanese PDA market. The PDA market grew steadily because people wanted to have fresh and massive information at their fingertips and also because companies hoped to increase the efficiency of white-collar workers with this equipment after the collapse of the bubble economy. Casio and Seiko Electronic Co. entered this PDA market after Sharp.22

Competitors
Sharp, Casio, Sony, Seiko and Apple are all device firms.

Service offerings
Zaurus provides data communication and a networking service such as NIFTY with a digital fax modem through a wired telephone or a cellular phone.

Customers
As shown in Figures 2-22 and 2-23, PDAs are still used mainly for business purposes and less familiar to the public than electronic organizers.

The majority of personal users are male. 30% of them are in their thirties, 25% in their twenties, and 25% in their forties. Of all functions, the PC data exchange function is the most frequently used.
Figure 2-22 PDA Usage in Japan

Question "Are you using a PDA?"

Yes 5%

No 95%


Figure 2-23 Breakdown of PDA Usage in Japan

2.5 Positioning

We use two axes to set up the domain of the Japanese mobile communications market and to position each carrier industry and each device industry on this conceptual domain map.

Definition of the map

We select a quantity of communications and the objectives of mobile communications as the two axes. The vertical axis expands when mobile communications increase, and it contains three points: interactive, multimedia, and quantity. The quantity of communication increases differently in terms of these three points. The horizontal axis expands as time quantity per time increases from voice, to letter, to data.

Figure 2-24 Conceptual Map of Current Japanese Mobile Communications Market

Currently, voice is the main function for the mobile communications market.
Positioning of the Carrier Industry
Currently there are two types of carriers in the mobile communications market: mobile phone carriers and paging carriers. Mobile phone carriers consist of Cellular carriers and PHS carriers.

Figure 2-25 Positioning Map of the Current Carrier Industry

Paging carriers occupy the voice communication and non-voice communication sections of the map, and mobile phone carriers occupy only the voice communication section.

Positioning of the Device Industry
There are three primary device industries; the mobile phone device industry, the paging device industry, and the EO/PDA device industry.
The mobile phone device industry is positioned mainly in high quantity and voice communication areas, and the paging device industry is positioned in the low quantity and voice communication/non-voice communication areas. The EO/PDA device industry just entered the mobile communications industry and has tried to create a new segment in this market.

2.6 Summary

In the Japanese mobile communication industry, there were originally two industries, the paging industry and the cellular industry, but those are now divided into four industries: the paging carrier industry, the paging device industry, the cellular carrier industry, and the cellular device industry. To these, we should also add as new entrants the PHS carrier industry, and the PHS device industry, and visual information radio as well as EO/PDA.
In Chapter 3, we summarize critical issues in the Japanese mobile communications industry and emerging trends which will impact the future market.
Chapter 3

Critical Environmental Changes

3.1 Changes in the Market

Rapid Growth

After governmental deregulation, new common carriers entered the business and the introduction of the device sales systems promoted market growth through lower prices both for service and equipment.

This market growth was too explosive to allow an extended forecast of future market size and profitability. PHS carriers, in particular, had financial difficulties because PHS history was too short to allow a forecast and its prices at the outset were too low to fight a full battle with Cellular.

The Leasing System and the Device Sales System

Compared with the previous leasing system and the device sales system, device firms did good business but carriers had several problems with the leasing system. Since the introduction of the device sales system, PHS and Cellular carriers have participated in buy-downs from device firms to retailers in order to attract new subscribers aggressively. Paging carriers have tried to promote moderately this direct sales system in order to decrease inventory losses.

Transition from the leasing system to the device sales system in the paging industry might decrease its market size. Paging carriers are going to shift paging contracts from the leasing system to the device sales system, because the leasing system has increased the cost of sales, inventory, and administration. Furthermore, users still prefer the leasing system
because the device sales system contract requires an initial investment and later the device becomes obsolete.

This transition will create an entry barrier for potential paging users which may result in customer outflow from paging to cellular or PHS. It is difficult for pager holders to develop device value after losing others' needs because the pager works only by others' request.

**Varied Distribution Channels**

In the past, mobile communication devices were distributed by the branches of carriers. However, rapid market growth and deregulation made carriers expand the distribution channel to consumer electronics retailers, convenience stores, and mail order. As a result, the conventional sole-channel structure will be destroyed, and distribution will become fragmented.

**Influential Factors in the Mobile Communications Market**

**Electronic mail**

*The importance of electronic communication is increasing.*

In developing the mission of its information system, each enterprise has been concerned about structuring its communication infrastructure, because it is emphasizing the improved productivity of its white-collar workers.

According to the August, 1995 survey of Nikkei Electronics, its information system division put priority on the development of the electronic communications system in 25% of all its companies, as shown in Figure 3-1.
**Figure 3-1 Needs of Information Systems**

<table>
<thead>
<tr>
<th>Issue</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development of distributed</td>
<td>49.5%</td>
</tr>
<tr>
<td>Introduction of E-mail, groupware</td>
<td>25.0%</td>
</tr>
<tr>
<td>Development of centralized</td>
<td>10.0%</td>
</tr>
<tr>
<td>Introduction of Internet</td>
<td>1.8%</td>
</tr>
<tr>
<td>Others</td>
<td>13.7%</td>
</tr>
</tbody>
</table>

*Source: Survey of Nikkei Electronics, August 1995*

Employees also are very interested in E-mail service. The survey said that 51.4% of the information systems divisions noted that end users strongly required E-mail services.

**E-Mail is the most important service for personal use in the PC network.**

The number of personal computer network users is 3.7 million in Japan, about half that of America. 77% of them use PC mainly for personal needs. According to the usage survey by the Association of New Media Development, 85.2% of the subscribers frequently use an E-mail service.

**The E-mail environment is still in an incubation stage.**

While some advanced enterprises have already utilized E-mail communication heavily, majority has not prepared enough insider environment for E-mail.
PC and LAN, the basis for E-mail communications, are too little diffused to increase their use. As of 1994, the PC penetration rate was only 15.3% and the LAN penetration rate was 22.3%. Even a large corporation would expect the penetration rate to be 37% or 41% respectively. Thus, the E-mail service penetration rate per employee is 16.2% and the Internet Mail service penetration rate is only 3.8%. Furthermore, E-mail communication is difficult to promote.

*Exponential growth of its use will come soon.*

Under these circumstances, many advanced enterprises have struggled to increase the E-mail usage ratio. For example, Kao, one of the leading Japanese detergent companies, started inside E-mail in 1990, but only 500 out of 8,000 employees utilized it in a 4-year period. From 1994 to 1995, the usage rate rapidly increased to almost 50%. Recruit, the leading recruiting service company, also spent four years promoting E-mail use. Even Hitachi, the leading computer company, spent half a year.

They said that promotion was important to encourage use. For example, Lion and Kao provided E-mail identification for all their employees. Kao introduced an anonymous E-mail system. At Recruit, the house journal department assigned to promote E-mail, mounted two campaigns. One was to create lead users intentionally; the other was to hold an E-mail festival as a corporate event. After this, the usage rate increased rapidly to above 10%.

*A key message for the paging industry*

Based on the above situations, we have summarized the following points for the paging industry.

- E-mail communication will become enormous in the future. As one convenient tool, the paging system will have a great opportunity.

- Diffusion, however, will need some effort. Easy accessibility and appropriate promotion are important to accelerate usage.
• E-mail in a business situation is often difficult to understand, and users will want to find a better means than E-mail for mutual communication. As paging systems have limited display size, a better format for express messages needs to be developed.

As E-mail usage increases, people may prefer their own personal mail to be different from their business mail. Personal E-mail communication needs may become prevalent. In particular, paging devices should be regarded not as emulators of E-mail but as new types of E-mail communicators.

**Social information infrastructures increase opportunities to differentiate.** Information systems have been more popular to use in Japan. This trend not only supports the growth of the mobile communications market but also indicates the following three major insights into the mobile communications market.

First, seamless accessibility to various information networks will increase the value of mobile communication. People normally utilize several information sources, such as TVs, computers, magazines, and conversation for their own objectives. Recently, integrated models such as the client-server model and object-oriented architecture respond to these customer needs.

Secondly, how easy the standardized operation way is will be important for mobile communication market expansion. ‘Natural selection’ has occurred in many industry areas, and operation has already been simplified. For example, Mac User Interface has become the only display style and Window 95 has imitated Mac’s. Netscape is the most likely present-day and possibly future standard for browsers. These more friendly User Interfaces have expanded and dominated the market.

Finally, non-real-time communication software like E-mail and agent information interaction becomes important. These bring more flexibility to human activities and spiral development to mobile communication capabilities. In the past, the non-real-time communication method was a letter. It needed, however, a certain delay and its contents were limited, but it provided flexibility in time and place. It did not influence human
activities very much. Now, the information system infrastructure evolution and mobile communications capability will resolve those limitations.

Applications and contents will play key roles.
As discussed in the previous section, non-voice communications will develop a large market. Then, application and content services will play a key role in the value of mobile communications, and application and content will not be provided by network carriers but by systems application providers or content providers.

They will be developed in the two ways, through closed networks for business use and open networks for public use. Typically the closed network will be through Zaurus. Sharp's Zaurus has almost reached one million units in the market. Under the pressure to increase white-collar productivity, it will expand for a while to include mobile devices in remote worker operations. These network services will be designed and provided by system solution providers.

The open network is not so big yet, but there are several information providers. Providers drive the network development. Unique applications will be provided with other media. For example, FM stations can try to send questionnaires during a music program, the listeners can get their response back to the station through the FM paging network, and new programs will be designed with these feedback results. This system will increase the value of the media, because programs will become interactive enough to attract more listeners.

3.2 Changes of the Competition

Increasing Players

After deregulation, new common carriers entered each industry; 2 groups in Paging, 4 groups in Cellular, and 3 groups in PHS.
Thus, competition became fierce among the three carrier industries. In particular, the battle between PHS and Cellular was enormous, because functional differentiation was extremely difficult.

Substitute by Other Industries

First of all, functional differentiation has not been sufficient for users to recognize the different advantages of competitors. Therefore, price battles have come to play major roles in competition. This fact indicates the strong substitutability among the various segments.

Product Integration

These three segments began to merge with one another and with adjacent portable information terminals like electronic organizers and PDAs. For instance, NTT DoCoMo began a service with a multi-function device for both paging and PHS. To seek an economy of scale under heavy infrastructure investment requirements, the PHS and Cellular industry segments may merge in the near future.

3.3 Changes in Society

Change of Communication Style

*The telephone circuit network has accelerated individualism: people like talking in a private room. Except for the higher air time charges, mobile devices will accelerate this tendency.*

The telephone has more dilution and a longer history than any to other telecommunications system. By investigating telephone communication style, we have found some critical factors influencing telephone progress which could apply to other telecommunication systems as well.
Telephone communication style has a paradoxical dimension because the people talking are physically distant, but they feel as if they are next to one another, and sometimes feel even closer than during face to face communication. This variety of communication reality is different from that of face-to-face communication. 

Even though the telephone has spread everywhere and to everyone, focusing on people who depend on telephone communication helps to analyze this reality that is peculiar to the telephone circuit.

NTT investigated the actual situation of telephone use at home or for personal reasons in 1989. As shown in Figure 3-2 and 3-3, as children grew up into college students, calling time and length increased. Elementary school students made calls 4 times a week with 3.7 minutes per call, and they received 3.6 calls per week. Females made more and longer calls than males did. In junior high school and high school, the older students were, the more and the longer calls they made. Especially, the length of time per call increased. Females advanced more than males in each life stage. College students used telephones more and longer, and gender differences in telephoning disappeared during this life stage. One out of four college students tended to have their own telephones. Because the length of calls increased with age, we inferred that the younger generation recognized relationships with close friends with long telephone calls.

A significant behavioral change seemed to take place after marriage. The difference between student and employee, employed or unemployed was not important. After marriage the tendency to call began to differ between males and females. Males decreased the length and frequency of calls, but females decreased only the length.

This telephone reality is especially true for single people, and most of all for single females. When people begin to live alone, they begin to depend on the telephone to build cozy relationships. Not only people living alone but even people living with families can feel as if they are living a single life through their telephone.
People who wanted their own telephone were 65.9% of the female college students questioned., 56.3% of the junior or junior high school students, 42.5% of the male college students, as shown in Figures 3-4 and 3-5.²

People who do not have their own telephone use a family phone as if it were their own telephone. They use it when other family members are out, or they use a public phone when they have something confidential to talk about.²
Figure 3-2 Calling Times in Each Life Stage

Figure 3-3  Calling Duration in Each Life Stage

Figure 3-4 Current Possession Rate and Intention of Personal Telephone

Figure 3-5  Current Usage of Family Phone

Source: Syunya Yoshimi, Mikio Wakabayashi, and Shin Mizukoshi, Telephone as Media (Japan: Kouhoudou 1992) 158.
Communication with Kindness

The pager boom and the psychological mechanism of the younger generation
Obviously the very low cost of paging has met the needs of the younger generation and has
created the recent boom. Here we examine the psychological mechanism behind the boom.

One of the key words to explain the character of the younger generation is “kindness,”
because kindness is deeply related to communication with one another. As of 1996, the
definition of kindness differs at about 40 years old, the post-baby-boomers. The difference
comes not from the current age but from the inherent generational personality.

Younger people do not like to be interfered with by feelings. They do not like to send or to
be sent fresh, hot feelings. “Old kindness” meant to sympathize or have a sense of unity
that makes a relationship smooth because of sympathy for others. But this is taboo for the
younger generation; they do not want to go into each other’s personal feelings. Not to pry
into others’ feelings is a requisite for maintaining a smooth relationship. They are,
therefore, sometimes inclined to guess about others without ever asking direct questions.³

Human bonds have a good aspect (affection) and a bad aspect (a fetter). There is always a
potential dilemma because both aspects exist in any human relationship.³

Pagers seem to have a unique, modest, and particular function for the younger generation,
because pagers just send ‘the will to want to talk’ and no ‘definite content.’ Senders sent
the message that they want to talk and wait for a receiver to call them back by phone.
Receivers wait for somebody who wants to talk to ring a pager. Senders can leave the first
action to communicate by voice to the receivers. A pager, so to speak, is a tool to lose
initiative. Moreover, receivers can protect their independence by turning off the pager
switch or excusing their non-reply by saying that they did not have the pager on, if they do
not want to talk. This erases the human relationship dilemma as described above because
this kind of relationship has no “fetter” aspect. This function fits the younger generation’s
needs because no dilemma exists and it is suitable to the “new kindness.” This is the
reason why the pager has become so popular with the younger generation, but a relationship without any fetter, is a weak one.  

There is a common characteristic shared by the old and the new kindness and that is that people try to make a smooth relationship by applying kindness to each other. To use the word kindness for a relationship is very recent phenomenon. The word kindness used to describe females or the characteristics of a flower that calm the viewer, but around 1970, when the university disputes occurred, kindness began to describe association and relationships. Moreover this kindness has changed from how to heal hurt feelings to how not to hurt others’ feelings.  

A cellular phone is a ‘hot line’ to communicate, and pager is a ‘warm line’ to communicate, and this warmth is apparently quite suitable for the younger generation. For the younger generation, a pager is not an instrument that can alarm a receiver like a phone. It is more an instrument to send the senders’ goodwill, to let the receiver know his/her telephone or pager number. If receivers like, they can send a message and their relationship is confirmed when the display shows the message. Pagers have enabled people to have relationships without talking in actual voices. A real voice is very important to maintain a good relationship in the light of old kindness but an obstacle to keeping it in terms of the new kindness. Younger people tend to be silent when older people talk to them. They cherish non-vocal words and warm relationships without words and they try not to express their true feelings.  

The younger generation is also weak and vacillating because it is afraid to make decisions that may lead to failure. Younger people do not like to accept blame. They tend to use phrases like ‘for the present,’ ‘tentatively,’ and ‘for the time being.’ These phrases are a kind of insurance. They can excuse their failures, because their decisions are tentative. They lack self-confidence. They find everything transient and they tend to say that they can not be strongly devoted to anything.
3.4 Repositioning

It is certain that the quantity of communications will increase in three years. At the same time, non-voice communications and data/information exchange will expand the Japanese mobile communications market size.

This expansion of non-voice communications and data/information exchange functions will offer the industries of the Japanese mobile communications market an opportunity to regroup by differentiating and reorganizing their position. Even now this regrouping movement can be observed in the introduction of multi-function PHS and paging device. When PDA and the Electronic Organizer industry tried to enter the mobile communications market, the paging and mobile phone carrier industries did not help them, but rather changed their strategies and positions as manufacturer-brand devices increased and it was common retailers who play an important role in collecting subscribers and selling devices.

As shown in Figure 3-6, the quantity of communication will increase, the emergence of data/information exchange functions and the expansion of non-voice communications will add new business opportunities to the mobile communications market. Users will definitely need mobile devices to perform another function, to modify and process data after they have acquired a data/information exchange function.

As a whole, the mobile communication market expands to more quantity and to the data/information exchange segment. As the cost of mobile phone devices and service fees decrease, the mobile phone carrier industry gains more and more of the voice-communication market segment from paging. Therefore, the paging carrier industry can not help but change its strategy and shift to non-voice communications and data/information exchange segments, as shown in Figure 3-7. While Cellular and PHS can shift more aggressively with their high speed transfer ability, paging carriers should find their own value-added way because of paging’s limited data transfer ability.
Figure 3-6  Expansion Image of Japanese Mobile Communications Market
Figure 3-7 Japanese Mobile Communications Carrier Industry Repositioning

Current (96)

High

Cellular/PHS Carriers

Paging Carriers

Low

Voice Communication
Non Voice Communication

Objectives of Mobile Communications

Future (99)

High

Cellular/PHS Carriers

Paging Carriers

Low

Voice Communication
Non Voice Communication
Information Accesss

Objectives of Mobile Communications
Figure 3-8 Japanese Mobile Communications Device Industries Repositioning

Current (96)

High

Cellular/PHS Handset

PDA

Low

Voice Communication

Non Voice Communication

Objectives of Mobile Communications

Future (99)

High

Mobile Phone Device

PDA

Low

Voice Communication

Non Voice Communication

Information Access

Objectives of Mobile Communications
As the PDA/Electronic Organizer industry enters the mobile communication industry, the boundaries among devices become increasingly obscure, and different devices will merge in an effort to get and dispense data communication, as shown in Figure 3-8.

3.5 Summary

Critical environmental changes in the market, the competition, and the society have caused each player to reposition his/her business in the Japanese mobile communications market. The data and information exchange market will grow as the EO/PDA industry enters and multi-function devices are introduced. How to deal with these new phenomena is a critical question for each player at this midway juncture.
Chapter 4

Industry Demand Forecast

A demand forecast is one of the very difficult tasks of the telecommunications industry. In the past, several forecasting teams developed predictions and were wrong. We, however, need to forecast industry demand to analyze industry attractiveness. In this chapter, we attempt a demand prediction for the four industries that we defined in the mobile communications market. To develop a credible forecast, we have applied the following three approaches and several forecasting methods.

- Logistic curve approach
- Empirical product penetration curve approach
- Comparison with US forecast approach
- Simulation of cordless phone penetration process

We have then integrated the forecasting results into one industry demand forecast.

Using the above approaches, we have filled out this table for our forecasting. Although our strategic time horizon is set for three years, we have made the target five years in order to recognize trends behind the forecasting numbers.

Figure 4-1 Matrix of the demand forecast

<table>
<thead>
<tr>
<th></th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paging carrier industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellular &amp; PHS carrier industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pager industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mobile phone device industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.1 Forecasting Approaches

We have developed three forecasting approaches: the logistic curve approach, the empirical approach with a new product penetration curve, and the comparison with US forecast approach. Although some of these are not based on academic theory, we have tried to forecast with them.

Logistic Curve Approach

The logistic curve is an approximation of the sales volume growth of new products using a simple formula which can be designed by choosing volumes at three time points. According to the "Strategy of the Mobile Communications Industry (Aoyagi, 1995)," forecasting with the logistic curve approach should be made according to the following steps.

Formula: \[ D_t = \frac{K}{1+n^* (e^a)^t} \]

- \( D_t \): demand at year \( t \)
- \( K \): mature demand
- \( n \): constant figure
- \( a \): constant figure

1. Decide on \( K \) based on the value of market and product analysis
2. Select two actual data from past market results
3. Compute \( n \) and \( (e^a) \) with the data and complete the formula
4. Put the numbers into \( t \) and compute future demand

Empirical New Product Penetration Curve Approach

This approach focuses on product penetration speed in Japan. When a new product appears, it gradually penetrates at the first stage and then increases rapidly. After the growing stage, the product enters into its maturity stage and its growth rate decreases. Finally the product reaches a saturation point and then sometimes disappears. When you
plot this growth history, the graph shows an S-shaped curve. Since many products follow this curve, the curve is sometime utilized for forecasting. Since the mobile communications service is a popular service for consumers with electronic appliances, we expect that the service will also follow this kind of product penetration trend.

For estimation method steps, we have made the following procedure;
1. Plot the time-series penetration data of information-related consumer products
2. Find out the key tendencies of the penetration process in the Japanese market
3. Apply these tendencies to each of the four industries and forecast the demand

**Figure 4-2** Empirical S-Shaped Curve

*Source: '96 Multimedia White Paper, '96 MPT Telecom usage survey, and project team estimation*
Following steps 1 and 2, we plotted the actual penetration rate per household of the major consumer information electronic appliances. (See Figure 001). As a result, we confirmed two key tendencies for products which reached 10% penetration;

- Standstill around 30% following continual increase\(^3\)
- Eight years to rise beyond 30% after going over 1%.

We will show the results of step 3 in our forecasting results for each industry.

**US Forecast Tracing Approach**

This approach simply applies the US forecast of penetration, comparing the penetration speed in Japan with that of the US. One reason that we applied this forecast is its credibility. American corporations in the mobile communications market have a long history of mobile communications and have spent their time making forecasts. Thus, we respectfully apply their estimation as a possible forecast. The other reason is that the Japanese penetration process has virtually followed the line of the US penetration with a one-year delay.\(^4\)

**Simulation of the Cordless Phone Penetration Process**

This approach forecasts the demand for home PHS sets, or PHS systems used in the home instead of the current ground phone system. PHS has been expected to supplant the current analog cordless phone as a high-performance digital cordless phone. Considering that the above three forecasting approaches are based purely on mobile communications needs, we had to apply the other method to predict the demand for Home PHS sets.

To respond to this concern, we assumed that the PHS penetration process as a digital cordless home phone would be similar to the cordless phone penetration process. We then
developed a simulation model that explains the history of the cordless phone, in order to use the model for forecasting a Home PHS demand.\(^5\)

1. Estimate customer life(horizon of customer use per product) from phone sales data
2. Estimate the number of current cordless phones active in the field (MIF)
   \[ \text{MIF(year } t = \text{MIF(year } t-1) + \text{GI (sales volume of year } t) - \text{Drop out (year } t) \]
3. Find out maturity demand size and the time to reach maturity

As a result, we found the following key messages for forecasting:

- **Cordless phones captured 60% of the total phone MIF and reached maturity.**
- **It took only seven years for them to reach the maturity points in terms of MIF.**

We will use this message for our prediction of the Cellular/PHS carrier industry and the mobile phone industry.

### 4.2 Demand for the Mobile Phone Device Industry

At first, we had difficulty with our prediction for the mobile phone device industry. We have explained our assumptions for this prediction and computed the numbers with the four approaches, before completing the forecast.

A mobile phone device is currently a cellular phone or a PHS hand-set. In the future, a hand-set of the home PHS system as a new digital cordless phone will also become a mobile phone device, although customers will buy them as substitutes for cordless phones. We have therefore assumed that the demand for the mobile phone device industry will consist of demands for current mobile phone devices and for home PHS sets.
Forecast

In view of this assumption, we have made, two forecasts for future mobile phone device demand; one is the demand for current mobile phone devices and the other is the demand for home PHS sets.

Demand for the Current Mobile Phones
According to the logistic curve approach, the demand for current mobile phones will be 29 million by the year 2000.
We set three data points; '1989(t=0), '1995(t=6), and '2010 (t for K). Then we picked out the numbers for the data points and developed the logistic curve, \( D_t = \frac{32000^6}{(1+64.3*0.55^t)} \) (Appendix 4-1).

We will verify this prediction with the other two forecasting approaches; the empirical new product penetration curve approach and the US forecast tracing approach.
The empirical new product penetration curve analysis states that Japanese consumer electronic products have the following common tendencies:
- They reach a standstill around 30% after continually increasing, and then they rise again
- They take about eight years to start rising beyond 30% after going over 1%.
The penetration rate of mobile phones in the Japanese households, went over the 1% penetration point in 1991, and reached almost 10% penetration in households in 1996. Combining the above information, we concluded that the penetration rate in 1999 should be at least 30%, which should account for at least 15 million Japanese households.
The US forecast tracing approach,4 on the other hand, provided a larger prediction. According to the US demand forecast, the number of mobile phone subscribers should be 38 million6; about 50% of all household should be equipped with cellular phones. With a drastic decrease in monthly expenses for users, the burden of cellular subscription in Japan could be expected to reach the same level as that in the US.
If we assume that the penetration rate will also rise to 50 % instead of 30%, the estimated demand in Japan would be 20 million.
Since the above estimates did not include the volume of business use, we had to add that number to develop the total demand. Among the total labor force of 65 million, the number of mobile workers would be 20%. If half of those mobile workers were equipped with cellphones to improve productivity, the amount would be 7 million. Given this, the forecast for the year 2000 is 22 - 27 million.

In conclusion, we have predicted the anticipated demand of mobile phone devices as follows.

**Figure 4-3** Demand forecast for current mobile phone devices

<table>
<thead>
<tr>
<th>Current mobile phone devices</th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16M</td>
<td>20M</td>
<td>23M</td>
<td>25M</td>
<td>27M</td>
</tr>
</tbody>
</table>

**Demand for Home PHS Sets**

According to the messages of the simulation of the cordless phone penetration process, PHS will also spread rapidly and increase its subscribers, reaching a figure of 17 - 20 million in the home phone market. It will grow as a substitute for cordless phones. Because PHS has been developed as the next generation cordless phone, it has can quickly supplant the current cordless phone in the field. At present, about 35 million cordless phones are being used in homes. The PHS’s mobile telecommunication capabilities will satisfy end users’ conversion needs with their high quality voice and security capabilities. PHS will also enable manufacturers to avoid a decrease in revenue from codeless phones, which are already saturated, in terms of volume, and for which the price has already dropped.

In our simulation, we have assumed that cordless phones have gained a 60% share over ground phones within just 7 years. Although PHS has several problems, such as its high cost (¥100K/set) and the limitation of PHS service areas, the aggressive investment of PHS carriers and an ordinal price-down in consumer electronics goods will eliminate these problems within two years. If Home PHS sets diffuse at the same speed as cordless
phones after 1997, when service will cover most residential regions, its subscriber market size will be 29 million by the year 2000.

**Figure 4-4** Demand forecast for Home PHS sets

<table>
<thead>
<tr>
<th></th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home PHS set</td>
<td>3M</td>
<td>7M</td>
<td>14M</td>
<td>21M</td>
<td>29M</td>
</tr>
</tbody>
</table>

**Demand for the Mobile Phone Device Industry**

As discussed above, the demand for the mobile phone device industry is an aggregation of the demand for current mobile phones and the demand for home PHS sets. Therefore, we conclude that the demand for the mobile phone device industry will be as follows.

**Figure 4-5** Demand forecast for the Mobile phone device industry

<table>
<thead>
<tr>
<th></th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
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<tbody>
<tr>
<td>Current mobile phone devices</td>
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<td>20M</td>
<td>23M</td>
<td>25M</td>
<td>27M</td>
</tr>
<tr>
<td>Home PHS sets</td>
<td>3M</td>
<td>7M</td>
<td>14M</td>
<td>21M</td>
<td>29M</td>
</tr>
<tr>
<td>Mobile phone device industry</td>
<td>19M</td>
<td>27M</td>
<td>37M</td>
<td>46M</td>
<td>56M</td>
</tr>
</tbody>
</table>

**4.3 Demand for the Pager Industry**

As with the forecast for the mobile phone device industry, we have made an assumption and developed our forecast.

We have defined the pager industry as firms which produce the devices for non-voice mobile communication. Although it now has only pagers connected to paging carriers, the industry will expand its product scope to include PDAs and electronic organizers. In addition, its products will connect to Cellular & PHS networks as well as to the paging network.
Forecast

According to the Logistic curve approach, the demand for pagers in the year 2000 will be 19 million. We set three data points; one in '1987 as a pager service starting point \((t=0)\), and the remaining two, '1995\((t=8)\) and '2010 \((t \text{ for } K)\). We then took the numbers of the data points and developed the logistic curve, \(D_t= 34000^6/(1+10.5^*0.82^t)\) (See Appendix 4-2).

Again we verified this prediction with the other two forecasting approaches, the empirical new product penetration curve approach and the US forecast tracing approach. According to the empirical analysis of new products penetration curve, pagers will also penetrate 30% of all households by the year 2000. This penetration also went over 10%, although its growth speed was not so rapid as Cellular's(Figure 4-2). As a result, the number of pager users should also reach at least one million by the year 2000.

Since the above estimates do not include the volume of business use, we had to add that number to develop the total demand. Among the total labor force of 65 million\(^7\), the number of mobile workers would be 20%. If half of those mobile workers were equipped with cellulares to improve productivity, the amount would be 7 million. Given this, the forecast shows a demand for 22 million pagers by the year 2000.

According to the US Pager Sales Forecast, the number of users in 1999 will be 47 million, or 17% of the population. Considering that the Japanese pager penetration rate is one year behind that of the US, we can assume that Japanese pager users will also represent 17% of all Japanese, or 21 million.

In conclusion, according to the above three estimates, we have predicted that the demand for the pager will be as follows:
Figure 4-6  Demand forecast for the pager industry

<table>
<thead>
<tr>
<th></th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pager</td>
<td>13M</td>
<td>14M</td>
<td>16M</td>
<td>18M</td>
<td>20M</td>
</tr>
<tr>
<td>industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.4 Demand for Carrier Industries

Carrier industries are the other group in the mobile communication market. We here develop the demand forecasts for the carrier industries; this demand is measured by the number of subscribers at a given point in time. We hypothesized that the number of subscribers should be the same as the total number of pager users and mobile phone device users, ignoring the possibility of devices connected to multiple networks. Another possibility is that some portion of pager devices would be networked by Cellular & PHS carriers, because of their interactive capabilities.

According to these hypotheses, we have made our assumptions and developed the demand forecasts for carrier industries and for the paging carrier industry and the Cellular & PHS carrier industries.

Assumptions

To predict the carrier industries’ demands, we needed to estimate the rate of interactive pagers among total pagers. Although we did not have sufficient information to develop our assumptions, we developed numbers that stimulated strategic thinking

The rate of interactive pagers
Since the pager industry is defined as including PDAs in the long term, some portion of the demands should be connected to Cellulors & PHS. In 1995, about 5% of all users connected their PDAs to a cellular network.8 We have supposed that the ratio in the year
2000 will fall in the 5%-20% range, because of the needs of interactive, especially for businesses.

**Forecast**

At first, we developed the total demand for carrier industries, and then we divided it into the two industries.

**Total demand**
The aggregate demand for carrier industries should be 76 million subscribers in the year 2000. The paging carrier industry and the Cellular & PHS carrier industries will share this volume.

**Figure 4-7**  Aggregated demand for carrier industries

<table>
<thead>
<tr>
<th></th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
</tr>
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<tbody>
<tr>
<td>Mobile Phone Device Industry</td>
<td>19M</td>
<td>27M</td>
<td>37M</td>
<td>46M</td>
<td>56M</td>
</tr>
<tr>
<td>Pager Industry</td>
<td>13M</td>
<td>14M</td>
<td>16M</td>
<td>18M</td>
<td>20M</td>
</tr>
<tr>
<td>Carrier industries Total</td>
<td>32M</td>
<td>41M</td>
<td>53M</td>
<td>64M</td>
<td>76M</td>
</tr>
</tbody>
</table>

**Demand for the Paging Carrier Industry**
Paging carriers can capture only pager users because there is no talking capability. Thus, maximum demand should be the same as for pager demand. In addition, we should subtract the demand for interactive pager.
**Figure 4-8** Demand forecast for the Paging Carrier Industry

<table>
<thead>
<tr>
<th></th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
</tr>
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<td>13M</td>
<td>14M</td>
<td>16M</td>
<td>18M</td>
<td>20M</td>
</tr>
<tr>
<td>% of interactive pager demand</td>
<td>5%</td>
<td>7%</td>
<td>10%</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>The interactive pager</td>
<td>1M</td>
<td>1M</td>
<td>2M</td>
<td>3M</td>
<td>4M</td>
</tr>
<tr>
<td>Paging Carrier Industry</td>
<td>12M</td>
<td>13M</td>
<td>14M</td>
<td>15M</td>
<td>16M</td>
</tr>
</tbody>
</table>

Demand for the Cellular & PHS Carrier Industry

As already noted, the total demand for the carrier industry is an aggregation of the demand for the paging carrier industry and that of the Cellular & PHS industries. We can, therefore, compute the demand for the Cellular & PHS carrier industries.

**Figure 4-9** Demand Forecast for the Cellular & PHS Carrier Industries

<table>
<thead>
<tr>
<th></th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier industries Total</td>
<td>32M</td>
<td>41M</td>
<td>53M</td>
<td>64M</td>
<td>76M</td>
</tr>
<tr>
<td>Paging Carrier Industry</td>
<td>12M</td>
<td>13M</td>
<td>14M</td>
<td>15M</td>
<td>16M</td>
</tr>
<tr>
<td>Cellular &amp; PHS Carrier Industries</td>
<td>20M</td>
<td>28M</td>
<td>39M</td>
<td>49M</td>
<td>60M</td>
</tr>
</tbody>
</table>

4.5 Summary

**Demand Forecast**

In the year 2000, about 76 million people in aggregation will use mobile communications services in Japan. In terms of the carriers, the Cellular & PHS carrier industries will rapidly grow to more than 50 million before the year 2000. On the other hand, the paging carrier industry will face a significant drop in its growth rate.
Figure 4-10 Demand forecast for the mobile communication industries

<table>
<thead>
<tr>
<th></th>
<th>'96</th>
<th>'97</th>
<th>'98</th>
<th>'99</th>
<th>'2000</th>
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</thead>
<tbody>
<tr>
<td>Paging Carrier Industry</td>
<td>12M</td>
<td>13M</td>
<td>14M</td>
<td>15M</td>
<td>16M</td>
</tr>
<tr>
<td>Cellular &amp; PHS Carrier Industries</td>
<td>20M</td>
<td>28M</td>
<td>39M</td>
<td>49M</td>
<td>60M</td>
</tr>
<tr>
<td>Device Industries Total</td>
<td>32M</td>
<td>41M</td>
<td>53M</td>
<td>64M</td>
<td>76M</td>
</tr>
<tr>
<td>Pager industry</td>
<td>13M</td>
<td>14M</td>
<td>16M</td>
<td>18M</td>
<td>20M</td>
</tr>
<tr>
<td>Mobile Phone Device Industry</td>
<td>19M</td>
<td>27M</td>
<td>37M</td>
<td>46M</td>
<td>56M</td>
</tr>
<tr>
<td>Carrier industries Total</td>
<td>32M</td>
<td>41M</td>
<td>53M</td>
<td>64M</td>
<td>76M</td>
</tr>
</tbody>
</table>

As for the device industries, the pager industry will develop stably and include PDA demands, and it will reach 20 million subscribers. Thus, the sales volume of the mobile phone device industry will also increase rapidly.

Concerns

The above forecast is based on several assumptions that we made. Therefore, we need to mention the following concerns that may influence our forecast.

Interrelationship between Cellulars and PHS

PHS will quickly penetrate the home market as a new cordless phone. If its service quality is improved enough for it to be used as a mobile phone for casual users, Home PHS sets may capture some portion of the mobile phone demand with a double duty.

Ratio of interactive pagers to total pager demand

Our forecast assumes that 20% of all pagers will connect to cellular & PHS carriers for interactive needs. This may be too pessimistic for paging carriers. At present, the ratio is around 5%. Therefore, we should consider the ratio will be between 5% and 20%.
Opportunity to connect to multiple networks

To simplify this forecast, we have assumed that a device should connect to a single network. Several carriers, however, have already introduced the devices with multi-networks. This is an additional demand opportunity for the carrier industries. It is possible for the paging carrier industry to gain this demand by providing the function on mobile phones, but only in the short term, not in the long term.
Appendix 4-1. Forecasting with Logistic Curve Approach (Mobile phone device)

Formula
\[
\frac{Dt}{11500} = \frac{K}{32000} / \left( 1 + n \cdot \left( e^{a} \cdot 0.55 \right) \right) \]

Method
1. Decide K based on the market/product value analysis
   \[K = \frac{32000}{11500}\]

2. Select two actual data
   \[\begin{array}{c}
   t = 0 \\
   D = 490
   \end{array}\]
   \[\begin{array}{c}
   t = 6 \\
   D = 11500
   \end{array}\]

3. Compute n with the data of t=0
   \[Do = K / (1 + n)\]
   \[n = 64.3\]

4. Compute \((e^a \cdot 0.55)\), which is assumed as A, with data of t=6
   \[D6 = K / (1 + n \cdot A^6)\]
   \[A = 0.55\]

Forecasting

<table>
<thead>
<tr>
<th>t</th>
<th>Year</th>
<th>Dt</th>
</tr>
</thead>
<tbody>
<tr>
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<td>490</td>
</tr>
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<td>1</td>
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<tr>
<td>2</td>
<td>1991</td>
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<td>2733</td>
</tr>
<tr>
<td>4</td>
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<td>31739</td>
</tr>
<tr>
<td>16</td>
<td>2005</td>
<td>31856</td>
</tr>
</tbody>
</table>
Appendix 4-2. Forecasting with Logistic Curve Approach (Pagers)

**Formula**

\[
D_t = \frac{K}{1 + n \cdot (e^{a})^t}
\]

*At = \frac{11000}{34000} \quad 10.5 \quad 0.82 \quad 8*

**Method**

1. Decide K based on the market/product value analysis
   \[ K = \frac{34000}{10000} \]

2. Select two actual data
   \[
   D_0 = 2953 \quad D_8 = 11000
   \]

3. Compute n with the data of t=0
   \[ D_0 = \frac{K}{1 + n} \]
   \[ n = \frac{34000}{10000} \]

4. Compute \((e^a)\), which is assumed as A, with data of t=6
   \[ D_6 = \frac{K}{1 + n \cdot A^6} \]
   \[ A = 0.82 \]

**Forecasting**

<table>
<thead>
<tr>
<th>t</th>
<th>Year</th>
<th>Dt</th>
</tr>
</thead>
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<td>1992</td>
<td>7037</td>
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<td>6</td>
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<td>10</td>
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<td>11</td>
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<td>19296</td>
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<td>14</td>
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<td>17</td>
<td>2004</td>
<td>25377</td>
</tr>
<tr>
<td>18</td>
<td>2005</td>
<td>26611</td>
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</tbody>
</table>

**Forecast of Pager Users**
PART II

Environmental Scan of
the Japanese Mobile Communications Market

Chapter 5

External Factor Analysis of the Mobile Communications Market

In this chapter, we will make an environmental scan to judge the attractiveness of the Japanese mobile communication market using External Factor Analysis. At first, we will introduce the basic concept of External Factor Analysis, and then we will evaluate the industries in the mobile communication market. Finally, we will summarize the key opportunities and threats for the paging carrier industry and the pager industry according to what has been discussed.

5-1 Methodology of External Factor Analysis

External Factor Analysis

Analysis of industry and competition is an orderly process. It attempts to capture the structural factors that define the long-term profitability prospects of an industry. It also attempts to identify and characterize the behavior of the most significant competitors.
According to A. Hax and N. Majluf, there are four basic methodologies used to perform this analysis:

- Porter’s framework for the structural analysis of industry
- Environmental scan at the business level based on external factor analysis
- Strategic group analysis
- Financial statement analysis framework

The environmental scan at the business level is based on identification of those critical external factors considered to be the central determinants of the industry’s attractiveness in the opinion of key managers. Unlike Porters’ model, which is based on a set of fixed factors, this model provides freedom to identify external factors that managers consider particularly related to the industry. Managers are required to engage in a totally fresh exercise to identify those issues that are considered significant. They also have to concentrate on the assessment of their influence on the industry’s attractiveness.

This approach taps into the broad range of experiences that managers have in a given business, and may be more suitable when the firms have been in an industry for a long time.

A. Hax and N. Majluf provide an initial set of factors broken up into five major categories: market factors, competitive factors, economic and government factors, technological factors, and social factors. Although they encourage managers to modify these categories to fit their specific circumstances, we will examine all five.

To identify the critical factors in each category, we interviewed twelve companies in Japan; these included carriers, device firms, and contents providers. Integrating their opinions into the framework, we structured the External Factor Analysis.

As a format for our External Factor Analysis, we follow the “Business Planner” jointly developed by Arnoldo Hax and Electronic Data Systems. In this format, each factor is evaluated on a five-point scale. After completing the analysis of each factor, one single
overall ranking of the industry’s attractiveness is made according to a three-point scale: low, medium, and high attractiveness.

Target industries

In the chapter 3, we positioned the four industries in the mobile communications market; the paging carrier industry; the Cellular & PHS carrier industry; the pager industry, and the mobile phone device industry. Following these positions, we will develop a clear analysis by each.

The paging carrier industry and the Cellular & PHS carrier industry
Carriers provide a service that connects end users by telecommunication network equipment. Among these carriers, the paging carrier industry is a group of firms offering non-interactive communication services for the exchange of small amounts of information. On the other hand, Cellular & PHS carriers offer interactive communication services for any amount of information exchange.

The pager industry and the mobile phone device industry
Here “Device” is a handy communication appliance with which users can access the carrier service. We can divide device manufacturers into two independent industries, the paging device industry and the mobile phone device industry.
The pager industry is a group of firms offering products that can display the information received via mobile network. By connecting the Cellular & PHS carrier network, its products also offer interactive information access. In the future, PDA will be virtually absorbed by this industry. On the other hand, the mobile phone device industry offers a hand-set for voice communication to which can also be added small display functions.
5-2 External Factor Analysis of the Paging Carrier Industry

In this section we analyze external factors that influence the attractiveness of the paging carrier industry. The external factors consist of market factors, competitive factors, economic and government factors, technological factors, and social factors.

Market Factors

Currently, the market for the paging carrier industry is “mildly attractive”. The market has grown stably for the last decade. The speed of the price drop is not so fast because of past price regulation and the limitation of players by MPT.

In the future, however, market attractiveness will drop to the “neutral level”. One of the major reasons for this is the uncertainty of future market growth.

Figure 5-1 Market Factors for the paging carrier industry

<table>
<thead>
<tr>
<th>Market Factors</th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size/growth</td>
<td>Small</td>
<td>Large</td>
</tr>
<tr>
<td>Product differentiation</td>
<td>Little</td>
<td>High</td>
</tr>
<tr>
<td>Price sensitivity</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Industry profitability</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

Market Size and Growth Rate

According to our estimation, the number of subscribers in the year 2000 will be only 16 million. Therefore, we assess the future impact of market size and growth rate as “Neutral”.

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Product Differentiation
At present, the services of paging carriers are not so differentiated, since their service is still very basic. In the future, they will expand their service line-up by utilizing the new FLEX-TD system. As a result, related software applications will also be offered to PCs and network servers. E-mail capability will also be one of the popular requirements.
In conclusion, the impact of product differentiation will shift from “Mildly unattractive” to “Neutral”.

Prices
One of the most important prices for the paging carrier industry is the monthly tariff. At present, price sensitivity for tariffs is relatively high. TTM set its usage fee slightly lower than NTT DoCoMo and succeeded in increasing its market share. This is just one example. Even in the future, the situation will not change. Since Cellular & PHS carriers and device manufacturers will compete for price destruction in all areas, tariffs, usage fees, and unit prices to acquire subscribers, customers will be obsessed with competitive costs. Carriers, in turn, will easily be able to control the market by changing their prices. Thus, the impact is “mildly attractive” now, and will continue at that level.

Industry profitability
Currently, the paging carrier industry enjoys profitability, mainly because of its low competitive intensity and almost 100% capacity utilization. It already has several profitability issues, however. Investment in FLEX-TD and price competition with PHS/Cellular may soon undermine its profitability. Furthermore, familiarizing customers with products and expanding the scope of products will raise operation costs and marketing expenses, and profitability may become neutral.

Opportunities and Threats
Threats
• Uncertain growth opportunity in the substitution of Cellular & PHS carriers
• Increasing marketing expense
• Increasing rivalry from over-capacity
Competitive Factors

Even though deregulation by MPT has gradually increased competitiveness over the last five years, it has not effected the industry adversely. Availability of substitutes and capacity utilization, however, are mainly contributing to an increase in competitive intensity. Thus, an assessment of competitive factors for the future is "Neutral".

Competitive Intensity

Currently, competitive intensity between paging service providers is relatively low. By the deregulation of 1987, competition was introduced to paging service providers for the first time. However, the costs of each service provider were strictly controlled by the MPT to protect NCCs. Because of this oligopolistic competition and the guidance of the MPT, competitive intensity is "mildly attractive" for the players.

Figure 5-2 Competitive Factors for the paging carrier industry

<table>
<thead>
<tr>
<th>Competitive Factors</th>
<th>Current</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive intensity</td>
<td>Large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of concentration</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High</td>
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<tr>
<td>Barriers to entry</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Barriers to exit</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Share volatility</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Degree of integration</td>
<td>Adverse impact</td>
<td></td>
<td></td>
<td></td>
<td>Positive impact</td>
<td></td>
</tr>
<tr>
<td>Availability of</td>
<td>Large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Small</td>
</tr>
<tr>
<td>substitutes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity utilization</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
</tbody>
</table>
In the future, it is expected that competitive intensity between paging service providers will increase from relatively small to neutral. In 1995, the MPT loosened its price control of pager rental charges. It shifted from the former license system to a prior report system. It also announced that it had started examining ways to shift the licensing system for service charges to a prior report system during 1996. In conclusion, because of the deregulation, competitive intensity will become neutral.

**Barriers to Entry**
Currently, barriers to entry for paging carriers are high. Because of regulation, the number of service providers in each region is limited. Therefore, entry barriers are high.
In the future, it is expected that entry barriers for paging carriers will stay high. Although in 1995, the MPT permitted FM Communications to start as FM paging services, we do not think that more entrants will be permitted in the near future. In addition, there exist several key barriers for entering this industry: economies of scale; experience effects; brand identification; and capital requirements.

**Share Volatility**
Currently, the share volatility of paging carriers is mildly low. Since the start of NCCs, they have constantly increased their market shares.
In the future, it is expected that the share volatility of paging service providers will shift from “mildly low” to “neutral”. The treats of substitutes will lead to intensive marketing by paging carriers, which may result in an increase of volatility. In conclusion, according to the increasing volatility of the paging service market, the share volatility of paging carriers will become neutral.

**Availability of Substitutes**
Currently, the availability of substitutes for a paging service is relatively low. Since paging carriers offer low prices and high-receipt-rate mobile communication, availability of substitutes is mildly low.
In the future, it is expected that the impact of the availability of substitutes will shift from “mildly attractive” to “mildly unattractive”. Since PHS service providers offer low-price services, its substitutability will increase with the increase of receipt rates. A paging
service is originally a cheap peripheral service for mobile voice communication. The recent price decrease in Cellular & PHS services is contributing to a decrease of this traditional role. In addition, substitutes will also compete with paging carriers in the new market area, or non-voice communication market. Paging carriers have preceded others in this area by exploring teenager communication. Cellular & PHS will aggressively absorb the demand in the new market with their interactive capabilities and high speed transmissions.

**Capacity Utilization**

Currently, the capacity utilization of paging service providers is high. Because of the constant growth of the paging service market, lack of capacity is the current problem.

In the future, it is expected that the capacity utilization of paging service providers will shift from high to neutral. In the urban area, where lack of capacity is the problem, paging service providers have decided to introduce new FLEX-TD protocol-based high-speed paging systems.\(^5\)\(^6\) Because of this innovation, paging service capacity will at least double its current capacity. In conclusion, the capacity utilization of paging service providers will become neutral.

**Degree of Integration**

Historically, the level of pager carriers' vertical integration has been high. They have handled supply through their own sales channel and controlled limited device suppliers as well. At present, they have started to utilize independent dealers as sales channels, while developing several new device suppliers. Furthermore, they have now allowed suppliers to provide devices with manufacturer brand names. With the above market growth and increasing complexity, the market value chain will change. Thus, the vertically integrated paging carrier industry will be fragmented into device manufacturers, network service providers(carriers), application and contents providers, and integrating service providers. This will be similar to the history of computer evolution.\(^7\) In conclusion, the degree of integration for the pager carrier industry will shift from high to neutral.
Opportunities and Threats

Threats

- Increasing rivalry from over-capacity
- Substitutability of Cellular & PHS carriers
- Loss of power from vertical integration

Economic and Governmental Factors

The Japanese economic environment is now recovering from the recession. Although interest rates will increase because of the economic recovery, the attractiveness of the industry will be affected positively. On the other hand, the government has been gradually decreasing the industry regulation to the paging carrier industry, and the industry will lose its attractiveness to some degree.

Figure 5-3 Economic and Governmental Factors for the paging carrier industry
Economic growth rate
At present, Japanese Economy is still in the “Heisei Recession” where the real GDP growth rate is only 0.9%. Thus, real GDP growth is unattractive for the pager carrier industry, though the mobile communication industry overall is growing rapidly. According to IMF’s 1996 world economic forecast, the real GDP rate will recover to about 3%. Its recovery speed will be slow, however. The Japanese economy has been trying to escape from this recession by restructuring corporation, amortizing bad loans, and adjusting stocks. In consequence, economic growth will become “neutral”.

Interest Rate
The current interest rate is very attractive for paging carriers which are basically a capital-oriented industry for network equipment. At present, the official discount rate is 0.5%, which is the lowest in Japanese history.
In the future, the rate will increase with economic recovery and will become “mildly attractive”.

Regulation
Currently, government regulation of paging carriers is highly attractive. MPT still limits the number of players to two (three in the case if FM stations are allowed to start the paging service). In addition, MPT has permitted sale of pagers instead of their rental (1995). Because of this deregulation, the diversity of pagers has increased. This in turn has increased the attractiveness of paging services.
In the future, it is expected that MPT will continue to deregulate paging carrier services. Thus the influence of government regulation on paging carriers will decrease and become “mildly attractive” for the industry.
Deregulation will have substantial impacts on the paging carrier industry in both positive and negative ways. The positive impact will expand its market opportunity and increase corporate flexibility. If the MPT allows paging carriers to provide information by getting revenue from advertising, this will accelerate the information-providing services of paging carriers. If the MPT allows them M&A operations, they may be able to merge with other carriers such as PHS and develop business portfolios for risk diversification. The negative
impact will be an increase in intensive competition brought on by deregulated price controls and new entrants.

**Opportunities and Threats**

**Opportunities**

- Growth opportunity in the recovery of the Japanese economy
- Corporate flexibility from deregulation

**Threats**

- Increase of competitive intensity

**Technological Factors**

New technologies integrating with other IT systems will increase business opportunities for the paging carrier industry. They have already begun to adopt the new protocol, FLEX-TD, which is one example of this. Such trend, however, will cause not only an increase of R&D investments but also an issue of de facto standards. Consequently, these influences will offset one another and the technology impact for the industry will remain “Neutral”.

**Maturity and Volatility**

Currently, the impact of maturity and volatility on paging carriers is “neutral”. The traditional paging technologies, which they currently use for their services, have reached maturity level. The matured technologies offer reliability and keep additional investments low. The carriers face a limitation of business opportunities, however, because of the lessened extendibility of the technology.

In the future, volatility will increase because recently carriers have started to launch the new protocol FLEX-TD. This will stimulate technological evolution in the paging carrier industry, which will spread its service potential, integrating other IT systems. Although this will create additional expenses for service development, we have concluded that maturity and volatility will become “mildly attractive” for the industry.
Figure 5-4  Technological Factors for the paging carrier industry

<table>
<thead>
<tr>
<th>Technological Factors</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>Positive impact</td>
</tr>
<tr>
<td>De Facto standard</td>
<td>Adverse impact</td>
<td></td>
<td></td>
<td></td>
<td>Positive impact</td>
</tr>
<tr>
<td>Patents</td>
<td>Adverse impact</td>
<td></td>
<td></td>
<td></td>
<td>Positive impact</td>
</tr>
<tr>
<td>Product R&amp;D requirements</td>
<td>Adverse impact</td>
<td></td>
<td></td>
<td></td>
<td>Positive impact</td>
</tr>
<tr>
<td>Process R&amp;D requirements</td>
<td>Adverse impact</td>
<td></td>
<td></td>
<td></td>
<td>Positive impact</td>
</tr>
</tbody>
</table>

De Facto Standards
Currently, the impact of technological standards on the paging carrier industry is "highly attractive" for that industry. The carriers have controlled other players with the standards and set the standards to maximize their own interests.

In the future, however, the situation will become "mildly unattractive". The paging carrier industry may lose the right to the final decision on standard selection. Its interrelationship with other IT systems will increase for such decision making and carriers will no longer be able to set standards just for their own stake. In addition, there will be the risk that other players will try to set standards quickly and that the market will select them as de facto standards.

On the other hand, the de facto standards issue will become very important for carriers, especially for gaining a competitive edge in the non-voice communication market against Cellular & PHS. Suppose that de facto standards of information-providing service are established for PHS. The related IT companies will support the standards and systems will become connectable for the services. After that, the contents providers and application providers will develop the contents and services, anticipating a potential market based on
the developed environment. Customers will use the service with a PHS network. Then, the positive feedback loop for further development will begin. As a result, paging carriers will no longer be able to develop an attractive market of their own, even though their technology may be superior.

In conclusion, the impact of de facto standards will drop from “highly attractive” to “mildly unattractive” for the paging carrier industry.

**Product R&D requirements**
Currently, the carrier industry has utilized mature technologies for traditional paging services. Thus, service R&D requirements are low and the impact is attractive for the industry. In the future, the new technologies and market opportunities for information access will increase R&D investments, and this will become a negative factor in the profitability of the industry.

**Opportunities and Threats**

**Opportunities**

- Growth opportunity in the non-voice communication markets with new technologies

**Threats**

- De facto standard competition with other carrier industries to gain market leadership
- Increasing R&D investments

**Social Factors**

As a whole, social factors are preferable for the paging carrier industry. Demographic changes will continue to increase the potential key users, single people. The communication format of the new generation prefers non-voice communication. As for business, corporations have aggressively invested in IT systems for information - sharing and communication improvement. In this line of the concept, paging carriers will have an opportunity to develop their business.
In terms of perspective of information value, Japanese society will gradually accept the idea of paying money for valuable information.

**Figure 5-5** Social Factors for the paging carrier industry

<table>
<thead>
<tr>
<th>Social Factors</th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Consumer protection</strong></td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
<tr>
<td><strong>Demographic changes</strong></td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
<tr>
<td><strong>Corporate reengineering and organizational change</strong></td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
<tr>
<td><strong>Preference of communication</strong></td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
<tr>
<td><strong>Perspective of information value</strong></td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
</tbody>
</table>

**Consumer Protection**
Currently, the impact of consumer protection is "neutral". In the future, it will become "mildly unattractive" because of the recent increase of criminals with paging devices among teenagers. We expect that such criminals will increase in accordance with pager penetration, and that some consumer protection movement will appear.

**Demographic change**
At present, demographic changes are "highly attractive" for the industry. In family structure, singles have continuously increased, and singles prefer to use mobile communication.
In the future, however, the attractiveness will decrease to "mildly attractive", because the number of the young people, the core segment for the recent growth of the paging carrier industry, will gradually decrease.\textsuperscript{12}

**Corporate reengineering and Organizational restructuring**

Recently to survive the current Japanese recession, companies have promoted more work efficiency to eliminate excess white-collar workers. To achieve this goal, several corporations have adopted flat and networked organizations in which top managers and bottom employees are connected by an information network. Theoretically this architecture will decrease decision making time and reduce the needs for supervisors. As a result, corporations have aggressively invested in IT related products and services. Mobile communication service in the business market has also grown in this environment.

In the future, this movement will be common in many enterprises. In consequence, its high attractiveness for paging carrier service will continue for a while.

**Preference of communication**

Recently, the younger generation has preferred to non-voice communication because of its sense of human relationships; in general, young people prefer to use pagers as tools of communication. Thus, the impact is mildly attractive for the industry.

According to "Kindness and Psychotherapy, Ken Ohira", one of the key expressions that explains the younger generation is "The New Kindness."\textsuperscript{13} Younger people do not like their feelings interfered with. They do not like to send or to be sent fresh and hot feelings. As a result, young people cherish non-voice words and warm relationships without words and try not to voice their true feelings.

Pagers just send "the will to want to talk" not "the definite content to talk." For the younger generation, pagers are not an instrument for sending goodwill. If receivers want to respond anything, they send a message and their relationship is confirmed when the display shows the message. Pagers have enabled people to have relationships without talking.

This trend should continue for the next three years, growing in numbers as it does. In consequence, it will become "highly attractive" for the paging service industry.
Perspective of information value
Currently, the perception of information’s value is low; people do not want to pay money for information. Thus, the impact on the pager carrier industry is "mildly negative". There is a unique social situation in Japan in which people are not willing to pay for service. They think the cost of service should be included in products. Information is also regarded as a service. Although more than 1 million people have already paid for PC-networks like AOL, the data base revenue in Japan has become saturated in the last three years.¹⁴
In the future, the situation will gradually change. First, many companies have started to establish information providing services on public networks for their business process innovation as well as for selling information itself. As a result, knowing how to access information will become more beneficial for consumers. On the other hand, increasing information sources will form a kind of information mall, which offers people more convenient access and also a sense of entertainment. In consequence, the perspective will become more positive and "mildly attractive" for the industry.

Opportunities and Threats
Opportunities
• Growth opportunity in the demographic increase singles
• Increasing acceptability of paying money for information
Threats
• Decrease of the younger generation

Overall assessment of the paging service industry

The paging carrier industry is losing its attractiveness in spite of Japanese economic recovery. The key negative factors are its saturated growth rate and aggressive substitutes. To overcome these challenges, the players should consider several opportunities to explore new market opportunities.
In conclusion, the impact of market factors will decrease to “medium attractiveness” for the industry.
Figure 5-6  Overall assessment of the paging carrier industry

<table>
<thead>
<tr>
<th>Overall Assessment</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Factors</td>
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<tr>
<td>Competitive Factors</td>
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<tr>
<td>Economic and Governmental Factors</td>
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<tr>
<td>Technological Factors</td>
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<tr>
<td>Social Factors</td>
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</tbody>
</table>

Attractiveness

<table>
<thead>
<tr>
<th>Overall Assessment</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
</table>

Opportunities and Threats

**Opportunities**

Economic & Governmental Factors
- Growth opportunity in the recovery of the Japanese economy
- Growth opportunity in the new markets allowed by deregulation
- Corporate flexibility from deregulation

Technological Factors
- Growth opportunity in the non-voice communications market with new technologies

Social Factors
• Growth opportunity in the demographic increase of singles
• Increasing acceptability of paying money for information

**Threats**

**Market Factors**
• Uncertain growth opportunity from the substitution of Cellular & PHS carriers
• Increasing marketing expense
• Increasing rivalry from over-capacity

**Competitive Factors**
• Increasing rivalry from over-capacity
• Substitutability of Cellular & PHS carriers
• Loss of power from vertical integration

**Economic & Governmental Factors**
• Increase of competitive intensity

**Technological Factors**
• De facto standard competition with other carrier industries to gain market leadership
• Increasing R&D investments

**Social Factors**
• Decrease of the younger generation

---

5-3 **External Factor Analysis of the Cellular & PHS carrier industry**

The Cellular & PHS carrier industry is one of the fast-growing industries in Japan. Its aggressive capital investment to respond to market demand reached $11 billion in 1995, and this has sustained the economic recovery as well. On the other hand, the industry is a real threat to the paging carrier industry. Competitors in the industry have aggressively acquired customers with intensive marketing and low prices. Thus, it is important to evaluate this industry carefully to develop a strategy for the paging industry.
We again will follow the external factor analysis format to discuss the industry.

**Market Factors**

There are many favorable trends affecting the Cellular & PHS carrier industry in Japan. The market, continuously stimulated by the intensive competition, will explode and so will the demand in the year 2000, with more than 50 million subscribers (Section 5 of Chapter 4). Extreme price reductions will contribute adversely to this attractiveness, however.

**Figure 5-7** Market Factors for the Cellular & PHS carrier industry

<table>
<thead>
<tr>
<th>Market Factors</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
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<tr>
<td>Future</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market size/growth</td>
<td>Small</td>
<td></td>
<td>Large</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product differentiation</td>
<td>Little</td>
<td></td>
<td>Big</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>Low</td>
<td></td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry profitability</td>
<td>Low</td>
<td></td>
<td>High</td>
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</tr>
</tbody>
</table>

**Market Size and Growth Rate**

At present, the number of mobile phone subscribers is about 11.5 million (As of March 1996)\(^6\). The current growth rate is incredible, almost 100%, with 5.5 million of new subscribers in 1995. By the year 2000, the Cellular & PHS carrier industry will retain at most 60 million of subscribers, based on our estimation. Among these, cellular subscribers and PHS subscribers will represent 29 million and 31 million respectively. This means that the industry will be in a highly attractive situation in terms of market size and growth.
Product Differentiation
At present, the services of Cellular & PHS carriers are not so differentiated, since their services are mainly used for voice communication. In the future, however, they will expand their services to the non-voice communication area. Especially in PHS, the players in the industry have already developed a common data-exchange-protocol and started to promote their technological advantages, contacting business entities. As a result, many application software will also be offered, which will in turn increase differentiation points. Therefore, their services will become more differentiated, though the impact of the attractiveness is still “neutral” because they are semi-public services.

Prices
Prices have decreased in all areas, tariffs, usage fees, and unit prices because of the entry of PHS, which has a lower cost structure and more importance in the competitors’ market share. The players, however, seem to think that the industry will still be profitable with its increasing customer base. Therefore, in the future, price destruction will continue, and unit prices will be cut to almost zero by the carriers to promote further subscribers. In consequence, the impact of prices will be “mildly unattractive”.

Industry profitability
Currently, the Cellular & PHS carrier industry has an overall profitable structure, although PHS companies show a financial loss because of previous intensive investment in infrastructure. In the future, we expect that profitability will continue despite the price destruction. One of the major reasons for this is that the industry now consists of multiple players with economic sense. We assume that the players will make cost reduction efforts at the same level as the US. carriers, who achieved significant cost reductions and higher profitability even after price destruction.

Opportunities and Threats
Opportunities
- Enormous growth opportunity in the mobile voice communications market
• Increasing product differentiation from the needs of the non voice communications market

• Streamlining of operations for profitability improvement

Threats

• Decreasing profitability from price destruction caused by intensive competition

Competitive Factors

The impact of competitive factors is “mildly unattractive” for the Cellular & PHS carrier industry because of competitive intensity and low degree of competition. We expect that the competition will become a little more intense in the future.

Figure 5-8 Competitive Factors for the Cellular & PHS carrier industry

<table>
<thead>
<tr>
<th>Competitive Factors</th>
<th>Current</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive intensity</td>
<td>Large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of concentration</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barriers to entry</td>
<td>Low</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Barriers to exit</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share volatility</td>
<td>High</td>
<td></td>
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</tr>
<tr>
<td>Degree of integration</td>
<td>Adverse impact</td>
<td></td>
<td></td>
<td></td>
<td>Positive impact</td>
<td></td>
</tr>
<tr>
<td>Availability of substitutes</td>
<td>Large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity utilization</td>
<td>Low</td>
<td></td>
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</tr>
</tbody>
</table>

104
Competitive Intensity
Currently, competitive intensity among PHS service providers is mildly high. In the Tokyo metropolitan area, there are three PHS carriers in addition to the four cellular phone carriers. This large number of competitors increases competitive intensity. The rapid growth of the market, however, has given each carrier a growth opportunity. As a result, competitive intensity among mobile phone service providers is mildly unattractive.

In the future, it is expected that competitive intensity will shift from "mildly unattractive" to "highly unattractive". Although future market growth will keep its high rate, competition among PHS systems and cellular systems will become more intensive. Cellular carriers will have to invest in infrastructure to sustain growth. In fiscal 1996, NTT DoCoMo plans to invest ¥250 billion in the Kanto area alone, and IDO plans ¥130 billion for the Kanto and Tokai area. This huge investment for infrastructure will increase competitive intensity among cellular carriers. PHS carriers will also have to invest a lot of money to expand its service area. In conclusion, because of internal competition and the necessity for huge investments in infrastructure, competitive intensity will be relatively high.

Availability of Substitutes
Currently, the availability of substitutes for mobile phone service is low. Even in the future, it is not expected that this will increase. Thus, the availability of substitutes is attractive now and also in the future.

Capacity Utilization
Currently, the overall capacity utilization of mobile phone service is neutral, while the capacity utilization of cellular phone service providers is high and the capacity utilization of PHS service providers is low.
In the future, because of aggressive investment in infrastructure, the capacity utilization of cellular phone service providers will become relatively low. On the other hand, PHS will increase its utilization level. In consequence, the influence of capacity utilization levels will still remain "neutral".
Degree of Integration
Like the paging carrier industry, the Cellular & PHS carrier industry has been highly integrated vertically. At present, however, they have fragmented their industry too quickly into devices, network services, applications and contents, and integrating services. In conclusion, the impact of integration for the industry will become "neutral".

Opportunities and Threats
Opportunities
- Enormous growth opportunity in the mobile voice communication market
Threats
- Intensifying competition with many players
- Intensifying competition from intermittent over-capacity

Economic and Governmental Factors

The Japanese economic environment is now recovering from the recession. Although interest rates will increase because of the economic recovery, the attractiveness of the industry will be affected positively by the factors. On the other hand, the government has been gradually decreasing regulation of the industry.

Economic growth
This impact level is similar to that for the paging service carrier industry. Thus, the economic growth will shift from highly unattractive to neutral.

Interest Rate
This impact level is similar to that for the paging service carrier industry. Thus, the interest rate will shift from "highly attractive" to "mildly attractive".
**Figure 5-9** Economic and Governmental Factors for the Cellular & PHS carrier industry

<table>
<thead>
<tr>
<th>Economic and Governmental Factors</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth rate</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Interest rate</td>
<td>Adverse</td>
<td></td>
<td></td>
<td>Favorable</td>
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<tr>
<td>Manpower supply</td>
<td>Restricted</td>
<td></td>
<td></td>
<td>Ample</td>
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<tr>
<td>Regulation</td>
<td>Unfavorable</td>
<td></td>
<td></td>
<td>Favorable</td>
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<tr>
<td>Government support</td>
<td>Unfavorable</td>
<td></td>
<td></td>
<td></td>
<td>Favorable</td>
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</tbody>
</table>

**Regulation**
Currently, government regulation of Cellular & PHS carriers is "mildly attractive" in terms of the point that it limits the number of players. Although the number is enough to intensify the competition.
In the future, it is expected that MPT will retain loose regulation to keep some control over the industry. Thus the influence of government regulations on the Cellular & PHS carrier industry will continue to be "mildly attractive".

**Opportunities and Threats**

**Opportunities**
- Growth opportunity in the recovery of the Japanese economy

**Threats**
- Increase of competitive intensity because of the MPT deregulation
Technological Factors

PHS as a new mobile phone service technology, has brought technological competition to the Japanese mobile phone carrier service. Therefore, the players have now made huge investments for system renovations. In the future, this will gradually relax with the maturity of the technologies. As for connectability standards with IT systems, PHS has succeeded in developing industry standards with IT companies. These will be more competitive, however. Cellular systems and the paging industry will also be expected to develop some standards. In conclusion, the impact of technological factors will be favorable to the industry in the future.

Figure 5-10 Technological Factors for the Cellular & PHS carrier industry

<table>
<thead>
<tr>
<th>Technological Factors</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maturity and volatility</td>
<td>Adverse impact</td>
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<td>Positive impact</td>
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<tr>
<td>De Facto standard</td>
<td>Adverse impact</td>
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<td></td>
<td></td>
<td>Positive impact</td>
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<tr>
<td>Patents</td>
<td>Adverse impact</td>
<td></td>
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<td></td>
<td>Positive impact</td>
</tr>
<tr>
<td>Product R&amp;D requirements</td>
<td>Adverse impact</td>
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<td></td>
<td>Positive impact</td>
</tr>
<tr>
<td>Process R&amp;D requirements</td>
<td>Adverse impact</td>
<td></td>
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<td>Positive impact</td>
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</tbody>
</table>

Maturity and Volatility
Currently, the impact of maturity and volatility on Cellular & PHS carriers is "mildly unattractive", mainly because of PHS service. The carriers have been developing various technologies to apply PHS to many customer requirements, such as cell-size expansion and
data-exchange-protocol. As a result, today’s PHS system is rapidly becoming obsolete, as is the cellular system, and these will require further technological investment. In the future, the volatility will continue until PHS can offer the same level of service quality as celluarls. These technological innovations will increase market opportunities and decrease costs, but they will require huge equipment investments for renewal. Therefore, we conclude that the impact of maturity and volatility on the Cellular & PHS carrier industry will become “mildly unattractive” for the increase of business opportunities.

**De Facto Standards**
Currently, the impact of technological standards in the Cellular & PHS carrier industry is “mildly attractive”, because the industry has been successfully developing standard protocols with other industry players. Last year, a PHS committee reached an agreement on industry level standard for data-exchange-protocol. In the future, however, the industry will have to struggle with the issue of standards between celluarls and PHS. The cellular systems also started to expand its data transmission speed to enter the non-voice communication and information access market. For this, it also may develop its own standard. In consequence, since the industry may resolve the issue of two standards, the impact of standards will become “neutral”.

**Product R&D requirement**
As discussed in “maturity and volatility”, the current Cellular & PHS carrier industry has faced an intensive development stage. Thus, service R&D requirements are so high that the impact has become “highly unattractive”. In the future, however, the needs of the carrier industry R&D investment will decrease because of technological improvement. Thus, the impact will become “mildly unattractive”.

**Opportunities and Threats**
**Opportunities**
- Growth opportunity in connectability with the IT systems
- First mover advantage to lead mobile network standards
Threats

- Short depreciation cycle of systems equipment caused by technological evolution

Social Factors

Social factors are "highly attractive" for the Cellular & PHS carrier industry. The increase of single families in demographic changes and corporate reengineering and organizational changes among business entities have supported the industry growth. In addition, the telephone has become a necessary tool for sustaining the individualism in Japan, and there are many potential customers who want to have their own personal phone (NTT survey). In consequence, the social factor is "mildly attractive" to the industry. This situation will continue until the year '2000.

Figure 5.11 Social Factors for the Cellular & PHS carrier industry
**Opportunities and Threats**

**Opportunities**

- Growth opportunity in the demographic increase of singles
- Increasing acceptability of paying money for information

**Overall assessment of the Cellular & PHS carrier industry**

The Cellular & PHS carrier industry has medium attractiveness, and this will not change for a while.

**Figure 5-12 Overall Assessment of the Cellular & PHS carrier industry**

<table>
<thead>
<tr>
<th>Overall Assessment</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
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</thead>
<tbody>
<tr>
<td>Market Factors</td>
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<tr>
<td>Competitive Factors</td>
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<tr>
<td>Economic and Governmental Factors</td>
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<tr>
<td>Technological Factors</td>
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<tr>
<td>Social Factors</td>
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</table>

**Attractiveness**

<table>
<thead>
<tr>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
</table>

**Overall Assessment**
This attractiveness derives from enormous growth opportunity in the voice communication market, from the favorable economic recovery, and from the interest in “communication”. Some of these will be offset, however, by very intensive competition with many players. Prices will decrease drastically and systems quickly become obsolete because of technological innovation.

**Opportunities and Threats**

**Opportunities**

**Market Factors**

- Enormous growth opportunity in the mobile voice communication market
- Increasing product differentiation in the needs of the non-voice communication
- Streamlining of operations for profitability improvement

**Competitive Factors**

- Enormous growth opportunity in the mobile voice communication market

**Economic and Governmental Factors**

- Growth opportunity in the recovery of the Japanese economy

**Technological Factors**

- Growth opportunity in connectability with the IT systems
- First mover advantage to lead mobile network standards

**Social Factors**

- Growth opportunity in the demographic increase of singles
- Increasing acceptability of paying money for information

**Threats**

**Market Factors**

- Decreasing profitability from price destruction caused by intensive competition

**Competitive Factors**

- Intensifying competition with many players
PART II

- Intensifying competition for intermittent over-capacity
  Economic and Governmental Factors
- Increase of competitive intensity because of the MPT deregulation
  Technological Factors
- Short depreciation cycle of systems equipment caused by technological evolution

5.4 External Factor Analysis of the Pager Industry

The pager industry is a group of paging device manufacturers. We have again utilized the method of External Factor Analysis. Since some of the factors have almost the same impact as those for the paging carrier industry, we have simplified the analysis of those factors.

Market Factors

The market, unlike that of the paging carrier industry, will grow stably by 15% a year and the new technologies, such as FLEX-TD, will encourage players to expand product breadths. Although price sensitivity will be high and cause price competition, market factors as a whole will be "mildly attractive" for the industry.

Market Size and Growth Rate
By the year 2000, paging devices including PDA will stably increase their subscribers by about 15% from 10 to around 20 million (Please refer to "Demand Forecast", Section 5 of Chapter 4). As noted in the definition of the industries (Section 4 of Chapter 3), the main market opportunity will be non-voice communication and information access areas. In conclusion, the impact of market size and growth is "mildly attractive, and will maintain its attractiveness."
Figure 5-13 Market Factors for the Pager Industry

<table>
<thead>
<tr>
<th>Market Factors</th>
<th>Highly Attractive</th>
<th>Mildly Attractive</th>
<th>Neutral</th>
<th>Mildly Unattractive</th>
<th>Highly Unattractive</th>
<th>Future</th>
<th>Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market size/growth</td>
<td>Small</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Large</td>
</tr>
<tr>
<td>Product differentiation</td>
<td>Little</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Big</td>
</tr>
<tr>
<td>Price</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Industry profitability</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
</tbody>
</table>

Product Differentiation
At present, the impact of product differentiation is “neutral”. While the product differentiation is tough because of the limitations of service functions, the players have successfully developed the differentiation points in terms of product image. In the future, manufacturers will be able to expand their product functionality by utilizing the new FLEX-TD system. This expansion of product breadths will allow manufacturers to increase the range of product differentiation. As a result, the impact will shift from “neutral” to “mildly attractive”.

Price
The buyers of pagers are currently paging carriers. The impact of price sensitivity is neutral. In the future, the situation will change. Buyers have now shifted their contracts with customers from rentals to sales. In the process, buyers will become more price sensitive and require lower bids. Consequently, the impact will be “mildly unattractive”.

Industry profitability
Currently, the paging device industry has enjoyed profitability, mainly because of its low competitive intensity and its mature technology. It, however, has developed profitability
issues, such as R&D investment to respond to FLEX-TD and expectation of “Lower Prices” from buyers. Furthermore, familiarizing customer with the products and the expansion of product breadths will increase operation cost and marketing expenses. Therefore, the impact of profitability will become “neutral” attractiveness.

**Opportunities and Threats**

**Opportunities**

- Growth opportunity in increasing demand for non-voice communication
- Opportunity to increase product differentiation

**Threats**

- Increasing price sensitivity of paging carriers
- Increasing marketing expense

**Competitive Factors**

Competitive factors are currently “mildly attractive” for the pager industry because of its NTT-controlled historical background of less competitive relationships. In the future the industry will become more competitive and attractiveness will drop to the “neutral” level.

**Competitive Intensity**

Currently, competitive intensity among pager manufacturers is “mildly attractive”. Since most of the pager manufacturers are originally telecommunications device manufacturers, they have successfully avoided intense price competition.

In the future, it is expected that competitive intensity among pager manufacturers will shift to “neutral”. Because of the growth of pager market, some consumer electronics companies, such as Sharp and Sony, have entered the paging device market. Since consumer electronics companies tend to initiate price competition, further price competition will start in the paging device market. In conclusion, because of the entrance of consumer electronics companies, competitive intensity will become “neutral” attractiveness.
**Figure 5-14** Competitive Factors for the Pager industry

<table>
<thead>
<tr>
<th>Competitive Factors</th>
<th>Current</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Competitive intensity</td>
<td>Large</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Degree of concentration</td>
<td>Low</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Barriers to entry</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Barriers to exit</td>
<td>High</td>
<td></td>
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<td></td>
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<tr>
<td>* Share volatility</td>
<td>High</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>* Degree of integration</td>
<td>Adverse impact</td>
<td></td>
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<td>Positive impact</td>
<td></td>
</tr>
<tr>
<td>* Availability of substitutes</td>
<td>Large</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>* Capacity utilization</td>
<td>Low</td>
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</tbody>
</table>

**Share Volatility**
Currently, the share volatility of pager manufacturers is “neutral” attractiveness. In the future, it is expected that the share volatility of pager manufacturers will shift from neutral to relatively high. Because of the increase of personal users and the shift of contracts from rentals to sales, differentiation of pager design and functionality has increased. It is also expected that pager manufacturers will further diversify their pager in a short product cycle. As a result, the share volatility of pager manufacturers will become mildly high, and the impact will become “mildly unattractive”.

**Availability of Substitutes**
Unlike the paging carrier industry, the pager industry will not suffer the threat of substitutes, because it will not suffer from the substitute issue by remaining in the paging network. Instead, it will develop products that connect to the Cellular & PHS network.
Therefore, the impact of the availability of substitutes will be “mildly attractive” for the industry.

**Opportunities and Threats**

**Threats**

- Increasing number of the important competitors
- Increasing rivalry stimulated by the entry of consumer electronics companies

**Economic and Governmental Factors**

As in the paging service industry, the impact of economic factors are currently “mildly unattractive”, and will shift to “mildly attractive”. On the other hand, the governmental factors are “neutral” for device manufacturers.

**Figure 5-15 Economic and Governmental Factors for the Pager industry**

<table>
<thead>
<tr>
<th>Economic and Governmental Factors</th>
<th>High</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic growth rate</td>
<td>High</td>
<td>Mildly Unattractive</td>
<td>Neutral</td>
<td>Mildly Attractive</td>
<td>Highly Attractive</td>
</tr>
<tr>
<td>Interest rate</td>
<td>Adverse</td>
<td>Favorable</td>
<td>Ample</td>
<td>Favorable</td>
<td></td>
</tr>
<tr>
<td>Manpower supply</td>
<td>Restricted</td>
<td>Ample</td>
<td>Favorable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regulation</td>
<td>Unfavorable</td>
<td>Favorable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government support</td>
<td>Unfavorable</td>
<td>Favorable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Opportunities and Threats

Opportunities

• Growth opportunity from the recovery of the Japanese economy

Technological Factors

At present, the impact of technological factors on the pager industry is "neutral". Traditional paging technologies, which are now mainly used for their services, has reached maturity level. While the matured technologies do not require many R&D resources, the industry has faced limitation of the product differentiation and gradually entered into a cost-based competition.

Figure 5-16 Technological Factors for the Pager industry

<table>
<thead>
<tr>
<th>Technological Factors</th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maturity and volatility</td>
<td>Adverse impact</td>
<td>Positive impact</td>
</tr>
<tr>
<td>De Facto standard</td>
<td>Adverse impact</td>
<td>Positive impact</td>
</tr>
<tr>
<td>Patents</td>
<td>Adverse impact</td>
<td>Positive impact</td>
</tr>
<tr>
<td>Product R&amp;D requirements</td>
<td>Adverse impact</td>
<td>Positive impact</td>
</tr>
<tr>
<td>Process R&amp;D requirements</td>
<td>Adverse impact</td>
<td>Positive impact</td>
</tr>
</tbody>
</table>

In the future, volatility will increase for the new protocol FLEX-TD. It will stimulate technological evolution in the paging device industry by integrating other IT systems. In addition, the new entrants coming from the consumer electronics industry will bring with
them excellent production technologies, which will quickly enable them to develop various kinds of products with high parts commonality. These will occasion additional development investment in the industry. In conclusion, the impact will also be neutral in the future.

**Opportunities and Threats**

**Opportunities**

- Growth opportunity in the non-voice communications market through new technologies

**Threats**

- Increasing technological difficulties
- Increasing R&D investments

**Social Factors**

As described in the social factors for the paging service industry, social factors will also be “mildly attractive” for the pager industry. The increase of single families in demographic changes and the corporate reengineering and organizational changes of business entities have supported the industry growth. Recently, the younger generation has come to preferable to non-voice communication because of their sense of human relationship, and they prefer to use pagers as tools of communication. Future concerns are the already high penetration rate of pagers among the younger generation and the decrease of the generation. In consequence, the social factor is “mildly attractive” to the paging device industry, and this situation will continue in the future.

**Opportunities and Threats**

**Opportunities**

- Growth opportunity in the demographic increase of the singles

**Threats**

- Decrease of the younger generation
**Figure 5-17 Social Factors for the Pager industry**

<table>
<thead>
<tr>
<th>Social Factors</th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer protection</td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
<tr>
<td>Demographic changes</td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
<tr>
<td>Corporate reengineering and organizational change</td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
<tr>
<td>Preference of communication</td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
<tr>
<td>Perspective of information value</td>
<td>Adverse impact</td>
<td>Favorable impact</td>
</tr>
</tbody>
</table>

**Overall assessment of the pager industry**

Overall, the attractiveness of the pager industry is medium at present. It has been sustained by its high market growth, less competitive rivalries, and favorable social factors. In the future, this attractiveness will stay at the same level, though competition will become more intense. Continued market growth, supported by economic recovery, will offset the negative impact.
Figure 5-18 Overall Assessment of the Pager industry

Overall Assessment

- Market Factors
- Competitive Factors
- Economic and Governmental Factors
- Technological Factors
- Social Factors

Atractiveness

<table>
<thead>
<tr>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
</table>

Overall Assessment

Opportunities and Threats

Opportunities

Market Factors
- Growth opportunity in the increasing demand for non-voice communication
- Opportunity to increase product differentiation

Economic and Governmental Factors
- Growth opportunity in the recovery of the Japanese economy

Technological Factors
- Growth opportunity in the non-voice communications market through new technologies

Social Factors
• Growth opportunity in the demographic increase of singles

Threats
Market Factors
• Increasing price sensitivity of paging carriers
• Increasing marketing expenses
Competitive Factors
• Increasing number of the important competitors
• Increasing rivalry stimulated by the entry of consumer electronics companies
Technological Factors
• Increasing technological difficulty
• Increasing R&D investments
Social Factors
• Decrease of the younger generation

5-5 External Factor Analysis of the Mobile Phone Device Industry

The mobile phone device industry is a group of firms that produce mobile phone devices which connect to the Cellular & PHS networks. The impact of its external factors is similar to the impact on the other industries we analyzed above. In addition, its relationship with the paging industry is not very significant, so we will discuss it briefly to avoid the repeating previous information.

Market Factors

By the year 2000, the number of mobile phones will become form 10 to 56 million. This means that the mobile phone device industry is attractive in terms of unit volume. The device price for carriers will, however, decrease drastically for the following two reasons: (1) market price destruction and (2) intensive competition among the many players.
The impact of the market factor on the mobile phone device industry is currently “neutral”, but it will become “mildly unattractive”.

Competitive Factors
Currently, competitive intensity among mobile phone manufacturers is high, and attractiveness is low. By the start of device sales in April 1994, the number of cellular phone manufacturers had increased from 10 to 20.²¹ Because of the entrance of consumer electric companies, there is now strong price competition.
In the future, it is expected that price pressure from intensifying mobile phone service industry will make this rivalry more intense. Furthermore, price-competitive foreign companies will enter the market in the future. The impact of the competitive factors is now “highly unattractive” and will continue to be “highly unattractive” in the future.

Economic and Governmental Factors
As in the Cellular & PHS carrier industry, the impact of economic factors is “mildly unattractive”, but it will shift to “mildly attractive”. On the other hand, the attractiveness of governmental factors will be “neutral” for device manufacturers.

Technological Factors
Technological volatility has become high, stimulated by the start of the PHS system. As a result, product evolution will be accelerated, and this will promote product turnover. Since a mobile phone is an assembled product with few components, we do not think the technological volatility will bring about a huge R&D investment in the industry. In consequence, the impact of technological factors is now “mildly attractive” and will continue as such in the future.
Social Factors
As with the technological factors, the social factors are also “highly attractive” for the mobile phone device industry. The increase of single families in demographic changes and corporate reengineering and organizational changes among business entities have supported the industry growth. In addition, the telephone has become a necessary tool for sustaining individualism in Japan, and there are still many potential customers who want to have their own personal phone (NTT survey). In consequence, the impact of social factors is “highly attractive” for the mobile phone device industry. This situation should continue as such through the year ‘2000.

Overall assessment of the mobile phone device industry
The mobile phone device industry is a very competitive industry. Although the market size

Figure 5-19 Overall Assessment of the mobile phone device industry

<table>
<thead>
<tr>
<th>Overall Assessment</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competitive Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic and Governmental Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technological Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Attractiveness

<table>
<thead>
<tr>
<th>Attractiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
</tr>
</tbody>
</table>

Overall Assessment
will continue to grow at a high rate, competitive intensity will destroy industry attractiveness through price destruction. Foreign manufacturers will accelerate the competition. In conclusion, the mobile phone device industry will become a less attractive industry in the future.

5-6 Summary

In the mobile communication market, we can identify four industries, the paging carrier industry, the pager industry, the Cellular & PHS carrier industry, and the mobile phone device industry. Since PDA industry, which is now independent of the other industries, will be integrated with the pager industry in the future, we regard it as part of the pager industry.

Figure 5-20 Industry Attractiveness of the Mobile Communication Market

Overall, the four industries will decrease in attractiveness because of intensive competition. The paging carrier industry is currently very attractive but will decrease to medium attractiveness. The Cellular & PHS carrier industry already has a severely competitive structure, but it will maintain medium attractiveness because of market growth. The mobile phone device industry is the least attractive industry among the four.
Paging device industry is an industry with potential. Although it will also face intensive competition, it has an attractive growth opportunity in the non-voice communication and information access markets, and an opportunity of wider product differentiation.

**Key Opportunities and Threats for paging industries**

In terms of the paging industries, we can summarize their key opportunities and threats as follows:

**Opportunities for the paging carrier industry**

- Growth opportunity in the recovery of the Japanese economy
- Growth opportunities in the non-voice communication market
- Growth opportunity in the demographic increase of the singles
- Increasing acceptability of paying money for information

**Threats to the paging carrier industry**

- Substitutability of Cellular & PHS carriers
- Increasing marketing expense
- Increasing rivalry from over-capacity
- Loss of power from vertical integration
- De facto standard competition with other carrier industries to gain market leadership

**Opportunities for the pager industry**

- Growth opportunity in the increasing demand for non-voice communication
- Opportunity to increase product differentiation
- Growth opportunity in the recovery of the Japanese economy
- Growth opportunity in the demographic increase of the singles
Threats to the pager industry

- Increasing price sensitivity of paging carriers
- Increasing marketing expense
- Increasing number of important competitors
- Increasing technological difficulties
- Increasing R&D investments
Chapter 6

Five-Force Model Analysis of the Japanese Paging Industry

We discussed the mobile communications market in the last four chapters and examined the industry’s framework and the overall trends and issues. In this chapter, we will focus on the two paging industries in Japan, the paging carrier industry and the pager industry. This chapter analyzes the attractiveness of the Japanese paging carrier industry and the Japanese pager industry. To maintain objectivity, we use Porter’s Five-Force model to analyze the industries. We believe that these analyses will reinforce the External Factor Analyses of the last chapter which were based on the opinions of industry managers.

First, we will summarize the methodology of Porters’ Five-Force Model Analysis. Then, we will analyze the industry accordingly to determine its attractiveness.

6.1 Methodology of Porter’s Five-Force Model Analysis

The most influential and widely used framework for evaluating industry attractiveness is the five-force model proposed by Michael E. Porter. Essentially, what he postulates is that there are five forces which typically shape industry structure: intensity of rivalry among competitors, threats of new entrants, threats of substitutes, the bargaining power of buyers, and the bargaining power of suppliers. These five forces delimit prices, costs, and investment requirements, which are the basic factors that explain long-term profitability prospects, and henceforth, industry attractiveness. ¹

As a format for the five-force analysis, we follow the “Business Planner” a software, developed jointly by Arnoldo Hax and Electronic Data Systems.
6.2 Five-Force Analysis of the Paging Carrier Industry

Barriers to Entry

As barriers to entry are high enough to discourage new entrants, it is hard to imagine that there will be any in the near future. The strongest factor is the government regulation which limits the number of pager carriers to two in any one region. In addition, the following factors discourage the entry to this industry - economies of scale, the experience effect, brand identification, and capital requirements.

Economies of Scale
As it is obvious that the profitability of the carrier business depends on the utilization level of a huge network infrastructure; its economies of scale are very high. Since the first movers have already established their customer bases, their cost advantage will be also stronger in the near future.

Brand Identification
Over more than five years, the two players in each region have spent heavily to establish their brand names. According to a market survey report held in 1995, more than 80% of most consumers know both companies. Given such a circumstance, it would be very costly to develop a new brand.

Switching costs
Most end users rent their device and pay a monthly service fee. For these customers, therefore, there is very little expense. In addition, the services are almost universal, and do not require a learning period, so switching costs now are very low. In the future, the increased number of sales instead of rentals will increase the difficulty of switching to another service.
**Government protection**

MPT has decided that paging services should be limited to two companies in each region. Therefore, new entry is virtually prohibited. The trend toward deregulation, however, may change this in the future. At present, MPT does allow FM stations to start pager services using FM pager systems.

**Figure 6-1** Barriers to Entry into the Paging Carrier Industry

<table>
<thead>
<tr>
<th>Key factor</th>
<th>Current</th>
<th>Future</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economies of Scale</td>
<td>Small</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product differentiation</td>
<td>Little</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand Identification</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching costs</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to distribution channels</td>
<td>Ample</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital requirement</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to latest technology</td>
<td>Ample</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government Protection</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience Effect</td>
<td>Little</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Overall**
The experience effect
Under intensive price competition, current players are expected to improve their operations’ efficiency. One typical example of this is AT&T’s cost reduction. Although AT&T has lost large portion of its market share in long distance calls, its cost structure is much better than that of MCI. Until recently, Japanese paging carriers have not made efforts like these to improve their efficiency because of its regulated business environment. We think, however, that they will initiate cost reductions in the future.

Opportunities and Threats
Opportunities
- Increasing cost competitiveness from economies of scale and from experience in the industry
- Increasing switching costs of pager purchase contracts.

Threat
- New entry of FM paging carriers

Barriers to Exit
Pager carriers have the characteristics of a public-service: telecommunication service owned by the government in the past. This background forces the players in the industry to be rigid. Although deregulation has relaxed somehow, exit barriers will remain high for a while.

Assets Specialization
The assets of pager carriers are mainly sending stations and control centers, which are specially designed for paging services.
**Governmental and social restriction**

Because the service is characterized as a public one and the companies have special licenses from the government, it is hard for them to terminate their business. The only way that they could be done would be the development of substitutes, which might eliminate the social need for the carriers’ permanent paging service.

**Figure 6-2 Barriers to Exit for the Paging Carrier Industry**

<table>
<thead>
<tr>
<th>Key factor</th>
<th>Current</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Asset Specialization</strong></td>
<td>High</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Strategic interrelationship</strong></td>
<td>High</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Emotional barriers</strong></td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Government and social restriction</strong></td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
</tr>
</tbody>
</table>

**Opportunities and Threats**

**Threats**

- Social restrictions even in times of sluggish performance
Rivalry among Competitors

Currently, rivalry among competitors is not so intensive. Two balanced players, NTT DoCoMo and NCC, have enjoyed the growing industry under the regulation of MPT. In the future, however, the intensity will increase, because industry growth will probably decrease and the additional capacity from the installation of FLEX-TD may generate large intermittent over-capacities. The opportunities are product differentiation and increased switching costs in the purchase contracts, which would relax competition.

**Figure 6-3** Rivalry among competitors in the paging carrier industry

<table>
<thead>
<tr>
<th>Key factor</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td># of equally balanced competitors</td>
<td>Large</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry growth</td>
<td>Slow</td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Fixed or storage cost</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Product features</td>
<td>Commodity</td>
<td></td>
<td></td>
<td></td>
<td>Specialty</td>
</tr>
<tr>
<td>Intermittent Overcapacity</td>
<td>Big</td>
<td></td>
<td></td>
<td></td>
<td>Little</td>
</tr>
<tr>
<td>Brand Identity</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Switching costs</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Strategic stake</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
</tr>
</tbody>
</table>

**Overall**

133
**Number of equally-balanced competitors**

In general, the small number of competitors lessen rivalry. In the paging industry, current number of the balanced competitors in each geographic region is two. For example, in Tokyo, the players are NTT Docomo Chuo and TTM. Both have almost the same market share.³

Although FM paging services may enter the market in the next, it seems difficult for them to achieve the same competitive power. Thus, competition will not be severe.

**Industry growth**

The future growth of the industry is uncertain. As discussed in the market factor analysis, pager industry will grow at a stable growth rate in the long term, but the paging carrier industry will drop the growth speed. The issue is whether or not pager carriers will be able to keep the market; in other words, the market size may be absorbed by the Cellular & PHS carriers.

**Fixed or Storage Costs**

Paging carriers need substantial fixed costs to maintain high-level operation. Fortunately, the industry is now faced with the capacity shortage problem to meet the demand; its effect on rivalry is not significant. It may become significant, however, after investments are made in additional capacity to acquire new customers, or when customers shift to other mobile services or computer network based communications.

**Product Features**

The current basic service is a commodity that is difficult to differentiate from other providers. Decreasing differentiation has the potential risk of decreasing profitability. The new communication protocol FLEX TD⁴ may extend the opportunity of developing various new services in the future. IP(Information Providing) service would also spread product breadth.
Opportunities and Threats

Opportunities

- Growth opportunity in non-voice message communication services
- Growth opportunity in information access services
- Increased switching costs in pager purchase contracts

Threats

- Increased rivalry from over capacity
- Increased substitution with PHS/Cellular

Power of Buyers

The current important buyers are the consumer electronics retailers and the business use corporations. In the future, the concentration level of retailers will increase, while IP service firms may become major buyers of network use.

The power of buyers will become significant mainly because of the availability of substitutes and the decreasing number of important buyers.

Number of important buyers

Similar to other consumer electronics products, discount retailers will become the key buyers. At present, carriers aggressively expand their dealership contracts with discount dealers. In the future, this practice will result in a small number of tough buyers.

Availability of substitute

Until recently, there was no real threat of substitution, but now traditional paging services as beeper may be replaced with low-priced cellular and PHS. Also, E-mail and information providing services may be supported by other IT alternatives, or cellars, PHS, satellite broadcasting, and low cost ground network.
Figure 6-4  Power of buyers for the paging carrier industry

Opportunities of forward integration
In contrast to the backward integration, MPT has prohibited carriers from entering the application and contents business. This, however, may change with deregulation trends. The key issue is, however, whether or not MPT should eliminate the barrier between broadcasting and telecommunication. If this happens, carriers will be able to offer contents services, which will be the business of future buyers.
Contribution to quality of buyers’ products/services
Among current users, only some business persons, such as field service engineers, use pagers to improve their service quality. In the future, however, the opportunity to contribute to buyers’ service quality would increase, if paging services could be utilized for IP service.

Opportunities and Threats
Threats
- Increasing availability of substitutes
- Increasing concentration in the hands of a few discount retailers

Power of Suppliers
Pager carriers have two major suppliers, device providers and network providers (NTT) who connect to pager receiving stations and sending stations. Since the carriers are an oligopoly, the suppliers’ power is weak. In the future, this power balance will continue, because internal rivalry among the device firms will intensify through sales-oriented marketing by carriers. As a result, carriers will easily be able to ask firms for what they want.

Number of important suppliers
In terms of the paging device, there are around five equally-balanced suppliers, none of whom have a dominant or stable share. In the past, most device firms tended to prefer one carrier. But, recently, they have begun to develop products for both carriers. This means that the power of device firms decrease as the number of suppliers increases.
In the future, we expect Sharp to become the sixth major supplier. It will just change the number five to six. As a result, the number of important suppliers will be mildly attractive, and will maintain that level.
**Figure 6-5** Power of suppliers for the paging carrier industry

<table>
<thead>
<tr>
<th>Key factor</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td># of important suppliers</td>
<td>Few</td>
<td>Few</td>
<td></td>
<td>Many</td>
<td></td>
</tr>
<tr>
<td>Availability of substitutes</td>
<td>Few</td>
<td></td>
<td></td>
<td>Many</td>
<td></td>
</tr>
<tr>
<td>Players' switching cost</td>
<td>High</td>
<td></td>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Opportunity of backward integration</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Threat of forward integration</td>
<td>High</td>
<td></td>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Contribution to quality of suppliers' product</td>
<td>Large</td>
<td></td>
<td></td>
<td>Small</td>
<td></td>
</tr>
<tr>
<td>Suppliers' profitability</td>
<td>Low</td>
<td></td>
<td></td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

**Players' (Carriers') switching costs**

Recent carrier activities have tended to decrease its switching costs. Integration of the protocol by FLEX-TD allows them expand their product's candidates. In addition, NTT DoCoMo changed its new product development policy, or gave up asking for the development of their own designed product requirements and has selected product among the offerings instead. This means that NTT DoCoMo will not spend on development, which has created some rigidity among the specific joint development partners.

The only exception to this is the network equipment located in their stations. As they are highly interacted with PBX and their controllers and must be compatible with the old proprietary system, pager carriers have to select the same suppliers if they want to minimize
additional investment with the utilization of old assets. This condition will continue for a while.

**Contribution to quality of suppliers’ product**
Device suppliers will be the source of new functions and better execution of carriers’ service. This is because device manufactures have much greater capability to create new features with their consumer product experience than carriers do. In addition, they are totally responsible for the development of products, while the carriers will just select products to sell though their routes.

**Opportunities and Threats**
**Opportunities**
- Increasing device differentiation to raise customer value of paging service
**Threats**
- Increasing dependence on device features

**Availability of Substitutes**

The technological evolution has enabled Cellular and PHS to substitute a paging carrier basic service. They can not only substitute pager calling -up service, but also provide two-way data communication as well as voice communication. In addition, the current use of paging service as a messenger may be absorbed by E-mail service with PC penetration. As for the information providing services in the future, CATV and broadcasting services may be possible substitutes for one another. This competition, however, will contribute to developing new kinds of communication. Thus, they are both competitors and partners.
**Figure 6-6** Availability of substitutes for the paging carrier industry

<table>
<thead>
<tr>
<th>Key factor</th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Star] <strong>Availability of close substitutes</strong></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>![Star] <strong>User's switching costs</strong></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>![Star] <strong>Substitute producer's profitability</strong></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>![Star] <strong>Substitute price/value</strong></td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
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</thead>
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<td><img src="#" alt="Neutral" /></td>
<td><img src="#" alt="Unattractive" /></td>
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<td><strong>User's switching costs</strong></td>
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<td><img src="#" alt="Neutral" /></td>
<td><img src="#" alt="Unattractive" /></td>
<td><img src="#" alt="Highly Attractive" /></td>
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</tr>
<tr>
<td><strong>Substitute producer's profitability</strong></td>
<td><img src="#" alt="Highly Attractive" /></td>
<td><img src="#" alt="Neutral" /></td>
<td><img src="#" alt="Unattractive" /></td>
<td><img src="#" alt="Highly Attractive" /></td>
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</tr>
<tr>
<td><strong>Substitute price/value</strong></td>
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<td><img src="#" alt="Neutral" /></td>
<td><img src="#" alt="Unattractive" /></td>
<td><img src="#" alt="Highly Attractive" /></td>
<td><img src="#" alt="Highly Attractive" /></td>
</tr>
</tbody>
</table>

**Overall**

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**Availability of close substitutes**
As noted the above, several alternatives of substitutes have invaded the market. Although their influence is not significant now, it will increase with price destruction and integrated service.

**User’s switching costs**
Switching costs are much lower. Compared to cellulators and PHS, the difference of the monthly fee will be very little. Also, since most of the contracts are based on rental system, there are no customer assets. Finally, the unit price of cellulators and PHS has become much cheaper, while that of pager has not. This might change if paging carriers could succeed in changing the value of paging service from only calling up to a personal non-voice communication. In such a case, the users’ switching cost would increase. In addition, purchase contract would increase the users’ switching cost.
Substitute value/price

Aggressive down-pricing and value-adding with IT will increase substitutes’ cost performance. For example, a cellular phone could only provide voice communication with a high usage fee in the past. Now its tariff is almost half what it was, and the new technology is going to enable it to make packet transmissions for data communication. Thus, the substitute value/price will become more attractive for customers. Furthermore, since cellular and PHS can have pager functions almost without additional cost, substitution may happen by absorbing functionality.

Opportunities and Threats

Opportunities

• Increasing switching costs from purchase contracts

Threats

• High substitutability of call-up services by cellular/PHS
• High substitutability of non-voice message communication by PHS
• Lack of de facto standards for information access with a paging service

Summary of Paging Carrier Industry

The current pager carrier industry is mildly attractive, mainly because of the limited number of players under regulation, and the stable high-market growth. In the future, however, the industry’s attractiveness will drop to the “Neutral Level” with the threat of aggressive substitutes, i.e., PHS and Cellular. In addition to this big challenge, the industry has several key concerns. One is the strong exit barrier of social restrictions. Another is the uncertain future of market growth. The third is lower switching costs for users and buyers.
**Figure 6-7** Overall Assessment of the paging carrier industry

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers to Entry</td>
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<td>High</td>
</tr>
<tr>
<td>Barriers to Exit</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Rivalry among competitors</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Power of Buyers</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Power of Suppliers</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Availability of substitutes</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Opportunities**

**Barriers to Entry**
- Increasing cost competitiveness from economies of scale and from experience
- Increasing switching costs in pager purchase contracts

**Rivalry among competitors**
- Growth opportunity in non-voice message communication services
- Growth opportunity in information access services
- Increased switching costs in pager purchase contracts
Power of Suppliers

- Increasing device differentiation to raise the customer value of paging services

Availability of Substitutes

- Increasing switching costs in purchase contracts

Threats

Barriers to Entry

- New entry of FM paging carriers

Barriers to Exit

- Social restrictions even in sluggish performance

Rivalry among competitors

- Increased rivalry from over-capacity

- Increased substitution with PHS/Cellular

Power of Buyers

- Increasing availability of substitutes

- Increasing concentration to a few discount retailers

Power of Suppliers

- Increasing dependence on device features

Availability of Substitutes

- High substitutability of call-up services by PHS/cellular

- High substitutability of non-voice message communication by PHS

- Lack of de facto standards for information access with a paging service
6.3 Five-Force Analysis of the Pager Industry

Barriers to Entry

Currently, the entry barrier of the paging device industry is neutral. The barriers to entry will become high in the future, because of brand identification, accessibility of the latest technologies, and product differentiation, while the carriers welcome new entrants.

Figure 6-8  Barriers to entry in the pager industry

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Future</th>
<th>Key factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economies of Scale</td>
<td>Small</td>
<td></td>
<td>Large</td>
</tr>
<tr>
<td>Product differentiation</td>
<td>Little</td>
<td></td>
<td>Significant</td>
</tr>
<tr>
<td>Brand Identification</td>
<td>Low</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Switching costs</td>
<td>Low</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Access to distribution channels</td>
<td>Ample</td>
<td></td>
<td>Restricted</td>
</tr>
<tr>
<td>Capital requirement</td>
<td>Low</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Access to latest technology</td>
<td>Ample</td>
<td></td>
<td>Restricted</td>
</tr>
<tr>
<td>Government Protection</td>
<td>None</td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Experience Effect</td>
<td>Little</td>
<td></td>
<td>Significant</td>
</tr>
</tbody>
</table>

Overall
Brand Identification
Since the devices are named by the carriers, the device makers’ brand identification is now low. Recent advertising strategy can put both carriers’ names and manufacturers’ names on them. In the future, through market experience, brand identification will increase as it did in the phone device industry where brand identity has given a strong advantage.

Switching costs
The paging carriers’ switching costs for devices are currently a little high. Carriers historically enjoyed intangible benefits from their relationship with device firms, such as efficient communication about product development and technology research. In addition, the carriers seem to have a sense of bonding with paging equipment, which is very difficult to switch because of software compatibility.
In the future, however, switching cost will decrease. The relationship between carriers and device firms has now loosened up enough to allow the new entrants.

Access to distribution channels
Although the distribution channel for paging devices has spread from single carrier branches to many kinds of retailers and dealers, accessibility to distribution will still be restricted. The carriers will continue to distribute a large volume by purchasing the devices from the manufacturers. One of the major reasons is that this value chain, similar in cellular and PHS industries, enables the carriers to promote subscriptions by reducing the device price with their own compensation.

Access to latest technology
For device makers, it has become more crucial to catch up with the new paging technology, because the new technology, which may influence a system’s value, will lead to changes in product goals. In addition, product life has been shortening. This means that device firms will have to develop new products in a very short time period to avoid technological obsolescence.
Accessibility to the latest technology will become more restricted. The key technological information, in the past, was provided by carriers to promote device firms’ product development. In the future, differentiated technologies will be developed by the device
firms themselves, so they will not want to provide the source of their differentiation to competitors.

**Opportunities and Threats**

**Opportunities**
- Increasing importance of brand identification
- Internalization of key technologies

**Threat**
- Decrease of carriers' switching cost

**Barrier to Exit**

Currently, the barriers to exit are “neutral”, and they will become lower. The key factor is the decrease of emotional barriers.

**Asset specialization**

Pager manufacturers' major assets are parts manufacturing equipment and their assembly lines. As these share commonality with other telecommunication devices, their assets specialization issue is small. In addition, the international pager market is expected to grow in the Asian market. The players can also transfer their assets to utilize them for demand.

**Emotional barriers**

At present, many of the paging device firms have a strong commitment to develop telecommunication-related products. NEC, MCI, and Motorola have made telecommunications their core business domain for a long time. As a result, they also have some rigidity exiting from this industry.

The emotional barrier, however, will gradually decrease in the future. Corporations have now become more radical about surviving in the low-growth economy. On the other hand, several new business opportunities other than the pager industry have been growing in the
telecommunications market, e.g. PHS. As a result, pager manufacturers can shift their businesses without changing their basic commitment.

**Figure 6-9** Barriers to Exist for the pager industry

<table>
<thead>
<tr>
<th>Key factor</th>
<th>Current</th>
<th>Future</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Specialization</td>
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<td></td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic interrelationship</td>
<td>High</td>
<td></td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotional barriers</td>
<td>High</td>
<td></td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government and social restriction</td>
<td>High</td>
<td></td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Opportunities and Threats**

**Opportunities**

- Decreasing emotional barrier to exit

**Rivalry among Competitors**

At present, internal rivalry is "mildly attractive" because of the small number of competitors and high industry growth. In the future, it will become "neutral" because of the increase in the number of the players and the diversity of competitors, while industry growth will sustain the attractiveness to some degree.
**PART II**

**Number of equally balanced competitors**

Since there are currently only five major players who have a 10 - 20% market share each\(^6\), the number is attractive for internal competition.

In the future, the situation will worsen to “neutral”. We expect that Sharp will become the sixth firm in the near future, because NTT DoCoMo has selected Sharp as one of the companies to work on joint development of devices for a high-speed pager system. In addition, several device manufacturers around the telecommunications industry may join the competition because the technological border between the industries will be lower.

**Figure 6-10** Rivalry among competitors in the pager industry

<table>
<thead>
<tr>
<th># of equally balanced competitors</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
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<th>Mildly Attractive</th>
<th>Highly Attractive</th>
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</thead>
<tbody>
<tr>
<td>Industry growth</td>
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<td>Low</td>
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</tr>
<tr>
<td>Fixed or storage cost</td>
<td>Large</td>
<td>Slow</td>
<td>High</td>
<td>Commodity</td>
<td>Specialty</td>
</tr>
<tr>
<td>Product features</td>
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<td>High</td>
<td>Little</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermittent Overcapacity</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand Identity</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversity of competitors</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic stake</td>
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<td></td>
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<tr>
<td>Overall</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

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Industry growth
The pager industry will grow at a stable growth speed, integrating with the PDA and Electronic Organizer market. Thus, industry growth will be “highly attractive”.

Product feature
Pager will evolve drastically with technological innovations and the spread of customer use. As a result, product variation will expand with new features. Therefore, we do not expect a risk of the commodity syndrome.

Diversity of competitors
Recent entrants, such as Casio and Sharp, have entered with unique market segmentation and product functions. For example, Sharp started to sell pagers integrating with work organizers. Casio developed “Bell me” with its marketing sense for the young-generation market. Likewise, competitors will diversify more to focus on their competitive edge. In addition, increasing system use with IT will foster system-solution developers to launch unique products using paging devices. This trend will lead to further diversification of competitors.

Opportunities and Threats
Opportunities
- Growth opportunity from the expanding market with the increase of product feature
Threats
- Increasing competition across industry borders
- Increasing difficulty of developing a market position with the increasing diversity

Power of Buyers
Currently, the buyers’ power is very strong because of the duopoly. In the future, their power will decrease because of the increase of buyers and contributions to the quality of carrier service.
**Figure 6-11** Power of buyers for the pager industry

<table>
<thead>
<tr>
<th>Key factor</th>
<th>Current</th>
<th>Future</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
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</thead>
<tbody>
<tr>
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<td></td>
</tr>
<tr>
<td>Availability of substitutes</td>
<td>Many</td>
<td></td>
<td></td>
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<td>Few</td>
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</tr>
<tr>
<td>Buyers' switching cost</td>
<td>Low</td>
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<td></td>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Opportunity of forward integration</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>Threat of backward integration</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Contribution to quality of buyers' product</td>
<td>Small</td>
<td></td>
<td></td>
<td></td>
<td>Large</td>
<td></td>
</tr>
<tr>
<td>Buyers' profitability</td>
<td>Low</td>
<td></td>
<td></td>
<td></td>
<td>High</td>
<td></td>
</tr>
</tbody>
</table>

**Number of important buyers**
At present, there are only two major buyers, NTT Docomo and TTM, who control all the volume sold in their region with their brand name. Device manufacturers cannot sell the products independently.

In the future, the number of key buyers will increase and reduce the unattractiveness. Recently, the carriers are exploring new channels to increase sales. This may develop the large independent dealer channels. On the other hand, the Cellular & PHS carriers might
start to buy the devices connected to their networks. As a result, the buyers’ power will weaken.

**Industry opportunity of forward integration**
The current direct buyers are the paging carriers, but pager manufacturers may integrate with the carriers’ marketing function in the future. Consequently, device manufacturers would be able to capture the profit that carriers have now. In addition, they would be able to improve the market response speed by receiving the direct market response without the cushion of the carriers. The acquired agility would then support the industry growth later.

**Contribution to quality or service of buyers’ products**
End users realize the carriers’ value by using the paging device. This means that the device is crucial for the carriers. In particular, future devices have to support very complex functions so that end users will be satisfied with their utility. In addition, after customer needs are verified by new devices, carriers can add the functions that respond to the needs. Thus, we can conclude that pagers will continue to contribute to the quality of buyers(carriers).

**Buyers’ profitability**
Three major market issues are going to make buyers’ profitability worse: the shortening of product life, price destruction, and customer shift to Cellular and PHS carriers. These profitability issues have already forced the carriers to require a severe cost-down of devices from device makers. The worse their profitability gets, the more aggressively they will push costs down.

**Opportunities and Threats**
**Opportunities**
- Increasing contribution to buyers’ service value
- Increase of the number of important buyers

**Threats**
- Buyers’ profitability issues
Power of Suppliers

The power of suppliers is strong and will stay strong. Paging devices have several critical components and parts; batteries, LCDs, memories, and software. Since only limited suppliers can provide these parts, their power is one of the key threats to this industry. In particular, the threat of forward integration will become a serious issue for companies who do not have supplier capability.

**Figure 6-12 Power of Suppliers for the pager industry**

<table>
<thead>
<tr>
<th>Key factor</th>
<th>Current</th>
<th>Future</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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<tr>
<td>Availability of substitutes</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Players' switching cost</td>
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<tr>
<td>Opportunity of backward integration</td>
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<td></td>
</tr>
<tr>
<td>Threat of forward integration</td>
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<td>Contribution to quality of suppliers' product</td>
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<tr>
<td>Suppliers' profitability</td>
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<tr>
<td>Overall</td>
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</tr>
</tbody>
</table>
**Number of important suppliers**
The key parts are currently batteries, LCDs, and several ASIC chips. In the future, Flash memories will also become core parts for pagers' data management. Since a paging device needs several uniquely designed parts because of its very small size, the suppliers are limited. In the future, several key parts will become common with miniaturization technology. However, circuit-related parts, such as Flash memory and ASIC may still be supplied by a limited number of firms.
Software is also a kind of important supply. At present, the new protocol, FLEX-TD is the key software among device firms. In the future, we think that several key software innovations will appear.

**Players' switching cost**
The more important the parts is, the more difficult it is for the device firms switch. Since the paging devices are highly-integrated, very small electronic devices, each part closely influences the other. This means that device firms may need to depend on several key devices. As a result, exchanging the parts with others would require a whole design change. This would happen especially in ASIC and the area of software.

**Suppliers' threat of forward integration**
Sharp, which recently entered this industry, is a company with key parts development capability, as well as LCD and Flash memory. Sony, which have the battery technology, has also already entered, though its market presence is very low. These companies will raise their positions with combinations of the latest parts technologies.

**Suppliers' contribution to quality and service of products**
The contribution of the key suppliers is large enough to influence product value and cost. For example, a battery is one of the major factors for mobility, weight, and available time. Therefore, the more intensive the competitive situation, the more important the suppliers become.
Opportunities and Threats

Opportunities

- Commoditization of key parts with higher commonality with mobile phone products

Threats

Forward vertical integration initiated by the key parts manufacturers

Availability of substitutes

Unlike the paging carrier industry, the pager industry will not suffer from the threat of substitutes, because it will not persist in the paging network. Instead, it will develop products connecting to the Cellular & PHS networks. Therefore, the impact of the availability of substitutes will be “mildly attractive” for the industry.

Figure 6-13 Availability of Substitutes of the pager industry

<table>
<thead>
<tr>
<th>Starred</th>
<th>Current</th>
<th>Future</th>
<th>Highly Unattractive</th>
<th>Mildly Unattractive</th>
<th>Neutral</th>
<th>Mildly Attractive</th>
<th>Highly Attractive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of close substitutes</td>
<td>High</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>User's switching costs</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substitute producer's profitability</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substitute price/value</td>
<td>High</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Overall
Availability of close substitute

Currently, a mobile phone with a display function is a close substitute, and it has now captured the pager needs for voice communication (Please refer to the industry positioning chart). In the future, threats will diminish in accordance with the industry's shift to the non-voice communications market. Pagers will become independent from mobile phone devices.

Users' switching costs

Current end customers use the products with a rental agreement, which does not impose a switching cost on them. Furthermore, both PHS and Cellular carriers have recently promoted their services by drastically decreasing the device price. Consequently, the switching cost is very low. In the future, the switching costs may increase if pager carriers succeed in a service fee decrease or a new additional service.

Opportunities and Threats

Opportunities

- Developing a border between voice communication and non-voice communication

Threats

- Substitution of mobile phones with a pager function in the voice-communication market

Summary of the Pager Industry

The current pager industry somehow has a "medium level" of industry attractiveness despite strong buyer powers, mainly because of low rivalry among competition.

In the future, the industry will develop a firm position by changing the product value from a supplemental product for voice communication to a device for non-voice mobile communication. Under such an environmental movement, pagers' technological evolution with FLEX-TD will soon open the door to extended business opportunities. The intensifying competition will, however, offset the above positive effect.
In conclusion, the industry’s attractiveness will be “Medium” in the future, too.

**Figure 6-14 Overall Assessment of the pager industry**

![Overall Assessment of the pager industry](image)

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barriers to Entry</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Barriers to Exit</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Rivalry among competitors</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Power of Buyers</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Power of Suppliers</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Availability of substitutes</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Key trends**
The industry will develop a firm position by changing the product value from a supplemental product for voice communication to a device for non-voice mobile communication. On the other hand, competitive intensity will become severe with the increase of important players coming from the consumer electronics industry.
Opportunities

Barriers to Entry
- Increasing importance of brand identification
- Internalization of the key technologies

Barriers to Exit
- Decreasing emotional barrier to exit

Rivalry among competitors
- Growth opportunity from an expanding market with increase of product features

Power of Buyers
- Increasing contribution to buyers' service value
- Increase of the number of important buyers

Power of Suppliers
- Commoditization of key parts with higher commonality with mobile phone products

Availability of Substitutes
- Developing the border between voice communication and non-voice communication

Threats

Barriers to Entry
- Decrease of carriers' switching cost

Rivalry among competitors
- Increasing competition across the borders of industry
- Increasing difficulty of developing a market position with the increasing diversity

Power of Buyers
- Buyers' profitability issues

Power of Suppliers
- Forward vertical integration initiated by the key parts manufacturers

Availability of Substitutes
- Substitution in the voice-communication market of mobile phones with a pager function
6.4 Summary

Overall assessment of the Paging Industry

The above Five-Force Analyses indicated that there will be a difference in terms of industry attractiveness between the paging carrier industry and the pager industry. The attractiveness of the paging carrier industry will drop from “High” to “Neutral” because of the threat of aggressive substitutes, i.e., PHS and Cellular. On the other hand, the attractiveness of the pager industry will stay at the “Medium” level, maintaining the industry growth with intensifying competition.

Figure 6-15 Overall Assessment for the paging carrier industry

<table>
<thead>
<tr>
<th>Attractiveness</th>
<th>Low</th>
<th>Medium</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Paging Carrier Industry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The Pager Industry</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Key Concerns

The paging carrier industry
Opportunities
- Growth opportunity in non-voice message communication
- Growth opportunity in information access services
- Increased device differentiation to raise the value of paging service
- Increased switching cost in pager sales instead of rentals
Threats

- Increased rivalry from over capacity.
- High substitutability of call-up service by PHS.
- High substitutability of non-voice message communication by PHS
- Lack of de facto standards for information access with paging services
- Increased dependence on device features

The pager industry

Opportunities

- Increased importance of brand identification
- Growth opportunity from an expanding market with the increase of product feature
- Increased contribution to buyers’ service value
- Increase of the number of important buyers

Threats

- Decrease of carriers' switching cost
- Increased competition across industry borders
- Buyers’ profitability issues
- Forward vertical integration initiated by key parts manufacturers

Comparison of Two Analyses

Through chapter 5 and 6, we developed our analyses of industry attractiveness with two different methodologies, External Factor Analysis and Porter’s Five-Force Analysis. Comparing the results, the overall assessments are the same. Thus, we are convinced of the validity of the evaluation.

In terms of key concerns, however, we found a new message from the Five-Force Analysis, or “key threats from power of suppliers”. This was because the managers...
interviewed were not interested in this area. Also, the Porter's model did not give much attention to the information access market, because that market is still too uncertain an area to discuss in detail.

Considering this experience, we think that we should continue to develop both industry analyses for the innovating industries. The External Factor Analysis would cover the attractiveness of the uncertain future direction of industries, and the Five-Force Analysis would contribute to analyzing practical industry attractiveness.
PART III

Internal Scrutiny of the Japanese Paging Industry

Chapter 7

Internal Scrutiny of the Paging Carrier Industry

In this chapter, we investigate the business scope and the unique competencies of each competitor in the paging carrier industry by using the internal scrutiny method of Arnoldo C. Hax and Nicolas S. Majluf. In the first section, we introduce the internal scrutiny method. In the following sections, we provide internal scrutiny of each competitor.

7.1 Methodology of Internal Scrutiny

Investigation of the set of factors that determine the competitive position a business will adopt in order to gain a sustainable competitive advantage is the central issue of internal scrutiny. First, we examine the business scope and priorities of each competitor in the mobile communications market. We do this for the whole mobile communications market rather than for the paging industry alone in order to assess each competitor's priorities vis-à-vis paging businesses in the mobile communications market. Secondly, we examine the unique competencies of each competitor in the paging industry. In assessing these unique competencies, we use the value chain to focus on each activity instead of focusing on the whole company. Thirdly, we classify them into the three generic strategies proposed by Michael E. Porter. Finally, with the above analysis, we provide a list of strengths and weaknesses and to be addressed by each competitor.
Business Scope in the Mobile Communications Market

The business scope of each competitor includes that competitor's current and anticipated business scope. This is expressed as a broad description of the products, markets, and geographical coverage of the business today within a reasonable time frame, commonly three-to-five years. In this paper, geographical coverage is limited to Japan. Therefore, only product scope and market scope have been analyzed as relevant factors in defining business scope.

Product Scope in the Mobile communications market
Products are the goods and services a business provides to customers. In the case of carriers, product scope is defined in terms of the type of communication system they operate and also in the type of service they provide. Figure 7-1 shows the product scope of a carrier in the mobile communications market.

<table>
<thead>
<tr>
<th></th>
<th>Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Communication</td>
</tr>
<tr>
<td>Systems</td>
<td></td>
</tr>
<tr>
<td>• Paging</td>
<td></td>
</tr>
<tr>
<td>• Cellular</td>
<td></td>
</tr>
<tr>
<td>• PHS</td>
<td></td>
</tr>
</tbody>
</table>

In the case of device manufacturers, product scope is defined in terms of the type of communication system they supply devices for and in the type of product they provide. Figure 7-2 shows the product scope of a device manufacturer in the mobile communications market.
## Figure 7-2 Product Scope of Device Manufacturers

<table>
<thead>
<tr>
<th>Products</th>
<th>Devices</th>
<th>Systems Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Paging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cellular</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• PHS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDA Communicators</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Market Scope in the Mobile communications market**

Market scope is defined as the customers who use the products of a business. Some important criteria for market segmentation are the type of industry targeted, demographics, the composition of customers, and the channels of distribution. In the case of carriers, market scope is defined in terms of end users and distribution channels. Figure 7-3 shows the market scope of a carrier in the mobile communications market.

## Figure 7-3 Market Scope of a Carrier

<table>
<thead>
<tr>
<th>Market Scope</th>
<th>End Users</th>
<th>Distribution Channels</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Business Users</td>
<td>• OEM</td>
</tr>
<tr>
<td></td>
<td>• Personal Users</td>
<td>• Manufacturer Brands</td>
</tr>
</tbody>
</table>

In the case of device manufacturers, market scope is defined in terms of carriers, end users, and distribution channels. Figure 7-4 shows the market scope of a device manufacturer in the mobile communications market.
Figure 7-4  Market Scope of a Device Manufacturer

<table>
<thead>
<tr>
<th>Products</th>
<th>Devices</th>
<th>Systems Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carriers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• NTTs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• NCCs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End Users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Business Users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Personal Users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution Channels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• OEM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Manufacturer Brands</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Priority Assessment
Both product and market scopes are prioritized using a priority assessment scale for business scope shown in Figure 7-5.

Internal Scrutiny

In this section scrutiny, we examine the activities of each competitor based on the value chain. The underlying principle of the value chain is that all of the tasks performed by a business organization can be classified into nine different broad categories. Five of them are the so-called primary activities, and the other four are labeled support activities. A full representation of the value chain is given in Figure 7-6.

The value chain concept provides a framework for organizing the tasks undertaken at the business level. Its categories, however, are still too broadly defined. For this reason, we classify the activities of the value chain into seven categories that are slightly different from those proposed by Porter. These are managerial infrastructure, finance, human resource management, technology, procurement, manufacturing, and marketing and sales.
In this paper, we focus on managerial infrastructure, technology, manufacturing, and marketing and sales. One is because these are the activities that affect competitive advantage in the paging industry. The other is because only little information on finance, human resource management, and procurement was available to the public.

**Figure 7-5 Priority Assessment Scale for Business Scope**

<table>
<thead>
<tr>
<th>Priority</th>
<th>The Product and Market ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>--</td>
<td>... is being divested or exited from.</td>
</tr>
<tr>
<td>-</td>
<td>... will be assigned a low level of importance.</td>
</tr>
<tr>
<td>E</td>
<td>... will continue to receive the current level of resources.</td>
</tr>
<tr>
<td>+</td>
<td>... is assigned a high level of importance and additional resources to achieve a better competitive position.</td>
</tr>
<tr>
<td>++</td>
<td>... is assigned the highest level of importance and the resources needed to achieve as outstanding a competitive position as possible.</td>
</tr>
<tr>
<td>New</td>
<td></td>
</tr>
<tr>
<td>--</td>
<td>... is very tentatively considered for business activity.</td>
</tr>
<tr>
<td>-</td>
<td>... is tentatively considered for business activity.</td>
</tr>
<tr>
<td>E</td>
<td>... will receive the necessary level of resources.</td>
</tr>
<tr>
<td>+</td>
<td>... will be assigned a high level of importance and the necessary resources to achieve a strong competitive position.</td>
</tr>
<tr>
<td>++</td>
<td>... will be assigned the highest level of importance and the resources needed to achieve as outstanding a competitive position as possible.</td>
</tr>
</tbody>
</table>

**Figure 7-6 The Generic Value Chain**


**Generic Competitive Strategies**

According to Michael E. Porter, there are three generic strategies for achieving above-average performance in an industry. Porter says that the fundamental basis of above-average performance in the long run is sustainable competitive advantage. There are two basic types of competitive advantage a firm can possess: low cost and differentiation. These two basic types combined with the scope of activities through which a firm seeks to achieve them lead to three generic strategies: cost leadership, differentiation, and focus. A focus strategy has two variants, cost focus and differentiation focus. Overall cost leadership and differentiation strategies seek competitive advantage in a broad range of industry segments, while focus strategies aim at cost advantage (cost focus) or differentiation (differentiation focus) in a narrow segment. All three generic strategies are shown in Figure 7-7.

166
Figure 7-7 Three Generic Strategies

<table>
<thead>
<tr>
<th>Competitive Scope</th>
<th>Competitive Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower Cost</td>
</tr>
<tr>
<td>Broad Target</td>
<td>Cost Leadership</td>
</tr>
<tr>
<td>Narrow Target</td>
<td>Cost Focus</td>
</tr>
</tbody>
</table>


Cost leadership
In cost leadership strategy, a firm sets out to become a low-cost producer in its industry. The firm has a broad scope and serves many industry segments and may even operate in related industries – its breadth is often important for its cost advantage. A cost leader, however, can not ignore the bases of differentiation. If its product is not perceived as comparable or acceptable by buyers, a cost leader will be forced to discount prices well below its competitors’ to gain sales. This may nullify the benefits of its favorable cost position. The strategic logic of cost leadership usually requires that a firm be the cost leader, not one of several firms vying for this position.

Differentiation
In differentiation strategy, a firm seeks to be unique in its industry along some lines that are widely valued by buyers. Differentiation can be based on the product itself, the delivery system by which it is sold, the marketing approach, or a broad range of other factors. A differentiator can not ignore its cost position because its premium prices will be nullified by a markedly inferior cost position. The logic of differentiation strategy requires that a firm choose attributes in which to differentiate itself and which are different from its competitors’. In contrast to cost leadership, there can be more than one successful differentiation strategy in an industry if there are a number of attributes that are widely valued by buyers.
Focus

Focus strategy is quite different from the others because it rests on the choice of a narrow competitive scope within an industry. It has to do with two variants. In cost focus, a firm seeks a cost advantage in its target segment, while in differentiation focus, a firm seeks differentiation in its target segment. Cost focus exploits differences in cost behavior in some segments, while differentiation focus exploits the special needs of buyers in certain segments. If a firm can achieve sustainable cost leadership (cost focus) or differentiation (differentiation focus) in its segment and the segment is structurally attractive, then the focuser will be an above-average performer in its industry.

Strengths and Weaknesses of Each Competitor

This step provides a qualitative statement of the strengths and weaknesses to be addressed by each competitor either to exploit its strengths or to neutralize its weaknesses.
7.2 NTT Mobile Communications Network, Inc. (NTT DoCoMo)

NTT DoCoMo was founded in 1991, and started operations in 1992, by separating paging and cellular service sectors from NTT. NTT DoCoMo, which covered all of Japan in the beginning, divided itself into nine independent regional companies in 1993. The parent company took over Tokyo and the nine surrounding prefectures (Kanagawa, Chiba, Saitama, Tochigi, Ibaraki, Gunma, Yamanashi, Niigata, and Nagano), while the eight new companies took over the remaining areas. In fiscal 1994, its net sales and net income were ¥381,795 million and ¥4,447 million, respectively. Figure 7-8 shows net sales by each business segment in fiscal 1994.

Figure 7-8 NTT DoCoMo's Net Sales by Business Segment in Fiscal 1994


In the paging business sector, it competes with Tokyo Telemessage in Tokyo, Kanagawa, Chiba, and Saitama prefectures. Figure 7-9 shows its number of subscribers and Figure 7-
10 shows its market share in these areas. Both NTT DoCoMo and TTM have local area services which cover each one of these areas and a wide area service which covers all four. From these Figures, it is clear that NTT DoCoMo's number of subscribers and market shares has decreased in its local area services. However, its number of subscribers and its market share have increased in its wide area service.

In the cellular service business sector, it competes with IDO, Tokyo Digital Phone, and Tu-ka Cellular Phone in Tokyo, Kanagawa, Chiba, Saitama, Tochigi, Ibaraki, Gunma, Yamanashi, Niigata, and Nagano prefectures. Figure 7-11 shows its number of subscribers and Figure 7-12 shows its market share in these areas. From these Figures, it is clear that NTT DoCoMo's number of subscribers has substantially increased in cellular services. At the same time, its market share in the cellular service industry has decreased from 71% (1990) to 60% (1994).

Service Scope in the Mobile Communications Market

NTT DoCoMo will put more importance on cellular service than on the paging service sector. Since its establishment, NTT DoCoMo has focused on paging and cellular phone services. In the paging service sector, it has decided to introduce the FLEX-TD protocol-based system to increase its capacity. It is scheduled to begin this commercial service in summer, 1996. This capacity increase will provide NTT DoCoMo with opportunities to expand its number of subscribers. In the cellular phone service sector, it competes with 3 other competitors. One of the main reasons for its high market share comes from its early coverage spread of numerous service areas. Because both the cellular phone and paging service markets are growing, it will focus on the two. However, since market size and growth opportunity in the cellular industry are expected to be higher than those of the paging industry, NTT DoCoMo will put a higher priority on the cellular service sector.
Figure 7-9  Number of Subscribers of NTT DoCoMo in the Paging Service Industry


Figure 7-10 Market Share of NTT DoCoMo in the Paging Service Industry

Figure 7-11 Number of Subscribers of NTT DoCoMo in the Cellular Service Industry

![Graph showing the number of subscribers of NTT DoCoMo from 1990 to 1994.]


Figure 7-12 Market Share of NTT DoCoMo in the Cellular Service Industry

![Graph showing the market share of NTT DoCoMo from 1990 to 1994.]

As for its information access services through the paging service system, it will continue to investigate business opportunities. First, its new FLEX-TD protocol-based system will give NTT DoCoMo the opportunity to offer information access services. The FLEX-TD system has a maximum transfer speed that is five times faster than the current POGSAG system. This high-speed paging system will enable NTT DoCoMo to send larger messages, which in turn, will enable it to offer information access services. Secondly, NTT DoCoMo has potential information providers in its group companies. For example, NTT-AD handles most of the advertising for the NTT group, which spends more than $200 million annually on TV, print, and transit advertisements. In the case of NTT DoCoMo, NTT AD produces advertising with Dentsu for cellular services and with Hakuhodo for paging services. Both Dentsu and Hakuhodo are major advertising companies in Japan. As NTT AD has acquired expertise in advertising through these activities, it has the potential to become an information provider. Figure 7-13 shows NTT DoCoMo’s expected priority in its current and future service scope.

<table>
<thead>
<tr>
<th>Services</th>
<th>Communication</th>
<th>Information Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Paging</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>• Cellular</td>
<td>++</td>
<td>– –</td>
</tr>
<tr>
<td>• PHS</td>
<td>– –</td>
<td>– –</td>
</tr>
</tbody>
</table>

**Market Scope in the Mobile Communications Market**

NTT DoCoMo will continue to focusing on business users and also put more importance on personal users. The NTT group has a competitive advantage in telecommunications systems for business uses. Therefore, it will continue to use the substantial marketing power of the NTT group in the telecommunications systems market, but it will also increase the priority on personal users. Recently, NTT DoCoMo has been losing its market share to TTM. One of the reasons for this is its late focus on personal users. In order to
attract personal users, it has begun to introduce colorful and originally designed pagers like those of TTM. One example of this is the Senty-A pager, shown in Figure 7-14, which features a wide message display panel as well as a thin body, light weight, and large message memory functions. This pager, developed by Kokusai and introduced by NTT DoCoMo, was the most successful pager in 1995. NTT DoCoMo also reduced paging service charges to attract price sensitive personal users. In these ways, NTT DoCoMo has begun to catch up with TTM in paging services that target personal users.

As for its distribution channel, NTT will gradually shift to manufacturer brand sales. First, it wants to decrease operational costs for the management of rental pager cancellations. Currently, paging carriers suffers from a high number of rental cancellations because of the short product life cycle of pagers. Secondly, if it moves to manufacturer brand sales too quickly, it will end up huge amounts of rental cancellations. Finally, it can not offer enticing incentives for pager sales. Paging carriers can not charge sufficiently high service fees to support pager sales incentives. Therefore, NTT DoCoMo will shift to its manufacturer brand sales gradually. Figure 7-15 shows NTT DoCoMo's expected priorities in its current and future market scope.

Figure 7-14 The Senty-A Pager
### Figure 7-15 NTT DoCoMo’s Market Scope Priorities

<table>
<thead>
<tr>
<th></th>
<th>Market Scope</th>
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<tbody>
<tr>
<td>End Users</td>
<td></td>
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<tr>
<td>· Business Users</td>
<td>++</td>
</tr>
<tr>
<td>· Personal Users</td>
<td>+</td>
</tr>
<tr>
<td>Distribution Channels</td>
<td></td>
</tr>
<tr>
<td>· OEM</td>
<td>E</td>
</tr>
<tr>
<td>· Manufacturer Brands</td>
<td>+</td>
</tr>
</tbody>
</table>

### Managerial Infrastructure

Management at NTT DoCoMo is bureaucratic. Although NTT DoCoMo is a private company, 95% of its shares are owned by NTT. 66% of NTT’s shares are, in turn, owned by the Minister of Finance. These relationships are one of the main reasons for which “up until now, NTT DoCoMo has maintained the stodgy bureaucracy of a government department.”

### Technology in the Paging Industry

NTT DoCoMo has leading technologies in the paging industry in Japan. First of all, NTT has developed an NTT protocol-based system and has used it for its paging system. Secondly, NTT DoCoMo’s time diversity technology was combined with Motorola’s FLEX™ protocol to develop the FLEX-TD high-speed paging protocol standard, and finally NTT DoCoMo decided to build an R&D center, which should be finished by March 1998. This will be the first R&D center for mobile communications carriers in Japan. All of this demonstrates NTT DoCoMo’s capability for developing paging technologies, and because of this capability, NTT DoCoMo is expected to keep its competitive advantage in paging technologies.
Operations

Before TTM offered its services, NTT DoCoMo focused on local area services because of its operational efficiency. With the rapid increase of TTM’s wide area service subscribers, however, NTT DoCoMo also started to offer wide area service. Since NTT DoCoMo’s number of subscribers and market shares in local area services has decreased substantially, its superiority in operational efficiency will also decline.

Marketing and Sales in the Paging Industry

NTT DoCoMo is strong in marketing pagers through its own offices as well as through NTT’s numerous branches. Because of the existence of NTT’s branches, NTT DoCoMo can do its marketing through direct channels.

NTT DoCoMo has also advantage in marketing its paging services for business users. NTT as a group has systems integration capability in the telecommunications market. As a result, NTT DoCoMo has an advantage in marketing paging services as part of a total telecommunications system. Since no other paging carrier will be able to supply total telecommunications systems, NTT DoCoMo will keep its advantage in the marketing of paging services for business users.

One concern for NTT DoCoMo is its marketing abilities for personal users. While it has been marketing paging services from all of its direct channels, its competitor has aggressively promoted its own services through department stores and other more commercially minded outlets. NTT DoCoMo has since realized its late focus on personal users and has started to follow its competitor’s strategy, but because NTT DoCoMo has a bureaucratic management structure, it would be difficult for it to become a more market-oriented company. If it could, its marketing of paging services would be competitive both for business and personal users.
Overall Assessment of NTT DoCoMo

Figure 7-16 summarizes the overall competitive position of NTT DoCoMo when compared with TTM.

**Figure 7-16 NTT DoCoMo’s Overall Competitive Assessment**

<table>
<thead>
<tr>
<th>Overall Assessment</th>
<th>High Weakness</th>
<th>Mild Weakness</th>
<th>Even</th>
<th>Mild Strength</th>
<th>High Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Managerial Infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Finance</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>- Human Resource Management</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>- Technology</td>
<td></td>
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<td>- Procurement</td>
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<td>- Operations</td>
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<tr>
<td>- Marketing and Sales</td>
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<tr>
<td>- Overall Assessment</td>
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</table>

7.3 Tokyo Telemesage Inc. (TTM)

TTM was founded in 1986, and started its paging services in 1987. It is one of the leading NCC companies covering Tokyo and the 3 surrounding prefectures of Kanagawa, Saitama, and Chiba. Since its establishment, its number of subscribers has regularly increased as shown in Figure 7-17. Its market share has also increased regularly, as shown in Figure 7-18.
Figure 7-17 Number of Subscribers of TTM in the Paging Service Industry


Figure 7-18 Market Share of TTM in the Paging Service Industry

Service Scope in the Mobile Communications Market

Since its establishment, TTM has focused, and will keep focusing on, paging services. It decided to introduce the FLEX-TD protocol-based system to increase its capacity.\(^{12}\) This is scheduled to begin commercial service in summer 1996, and this capacity increase will provide TTM with opportunities to expand the number of its subscribers.

As concerns information access services, it will keep on investigating business opportunities. The new FLEX-TD protocol-based system will provide TTM with opportunities to start information access services just like those of NTT DoCoMo. TTM has also started to send e-mail to pagers. In 1989, it formed a contract with a PC communications company to initiate a service allowing PC communications users to send e-mail to pagers.\(^{13}\) This is just one example of how anxious TTM is to start new services. Finally, Mitsui and Company, Ltd. (Mitsui), which is a major TTM shareholder, has started investigating possibilities for new services. Mitsui, in conjunction with The National Dispatch Center, Inc. (NDC), a San Diego-based U.S. Corporation, announced that the two companies have initiated a cooperative study to investigate new services which would make full use of both current and innovative infrastructures, as well as specialized information services. Mitsui is considering providing an integrated service that will incorporate paging and other mobile communications services with simple and easy-to-use call center services, all via an NDC system in Japan. According to the plan, NDC Japan will deliver sophisticated information and data services, which are new to the Japanese market. These new services may include the delivery of real-time stock market price updates and e-mail pager notification.\(^{14}\) This aggressive market research is a strong back up for TTM's information access services. Figure 7-19 shows TTM's projected priorities in its current and future service scope.
**Figure 7-19 TTM’s Service Scope Priorities**

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<thead>
<tr>
<th></th>
<th>Communication</th>
<th>Information Access</th>
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<tbody>
<tr>
<td>Systems</td>
<td></td>
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<tr>
<td>* Paging</td>
<td>++</td>
<td>+</td>
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<tr>
<td>* Cellular</td>
<td>--</td>
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<tr>
<td>* PHS</td>
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</tbody>
</table>

**Market Scope in the Mobile Communications Market**

TTM will continue to focus on personal users. Until TTM started its operations in 1987, the pager market had been monopolized by NTT. In order to capture personal users, TTM constantly set its service charges lower than those of NTT DoCoMo. It also introduced colorful and originally designed pagers featuring wide message-display panels. By setting service charges lower than those of NTT and introducing attractive new pagers ahead of NTT, TTM successfully attracted young personal users. Because of these efforts, the percentage of its personal subscribers now accounts for more than 50% of its users. Because of its expertise in marketing for personal users, it will continue to focus on that market.

One of TTM’s problems with personal users is their high cancellation rate for rental pagers. Because of the introduction of differentiated pagers, young personal users tend to cancel rental pagers at a higher rate than business users do. In order to reduce this cancellation rate, TTM will have to diversify its customer base to include different age segments.

As for distribution channels, TTM will gradually shift to manufacturer brand sales for the same reason as NTT DoCoMo. First, it wants to decrease the operational costs of managing rental pager cancellations. TTM is expected to have more problems with rental cancellations than NTT DoCoMo because of the high percentage of personal users. Secondly, if it quickly moves to manufacturer brand sales, it will end up with a large volume of rental cancellations. Because TTM has a higher percentage of personal users, it
will also be more affected by the changes in distribution channels than NTT DoCoMo.
Finally, it can not offer enticing incentives for pager sales. Because TTM does not have
another profitable business to support incentive payments, it will have to face more
difficulties than NTT DoCoMo. In conclusion, although TTM has more problems from
rental cancellations than NTT DoCoMo, it can not shift to manufacturer brand sales quickly
because of the risk of numerous cancellations and a lack of resources to support incentive
payments. Therefore, it too will gradually shift to manufacturer brand sales. Figure 7-20
shows TTM’s anticipated priorities in its current and future market scope.

**Figure 7-20** TTM’s Market Scope Priorities

<table>
<thead>
<tr>
<th>End Users</th>
<th>Market Scope</th>
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<tbody>
<tr>
<td>• Business Users</td>
<td>E</td>
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<tr>
<td>• Personal Users</td>
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</table>

<table>
<thead>
<tr>
<th>Distribution Channels</th>
<th>Market Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>• OEM</td>
<td>E</td>
</tr>
<tr>
<td>• Manufacturer Brands</td>
<td>+</td>
</tr>
</tbody>
</table>

**Managerial Infrastructure**

TTM’s management is a marketing-oriented one. Its five largest shareholders are Japan
Corporation, and Nissho-Iwai Corporation. In Japan, it is common for new companies to
hire managers from investing companies. For example, TTM’s first President came from
Mitsui and its current one is from Tokyo Electric Power. As 3 of its 5 largest shareholders
are trading companies, TTM’s management is distinctly marketing-oriented.
Technology in the Paging Industry

TTM is active in the introduction of new technologies. Although TTM does not have strong internal technological capabilities, it has actively introduced new functions and devices developed by suppliers. It introduced a pencil-type pager developed by Motorola in 1988.\textsuperscript{15} It also introduced card-type pagers developed by Motorola and NEC in 1991.\textsuperscript{16} In addition, it introduced a free-word pager, which can convert Arabic numbers to Japanese characters. This occurred in March, 1994, before the same type of pager was introduced by NTT DoCoMo in April, 1995. Thus, TTM has been active in the introduction of new technologies developed by suppliers.

Operations

Historically, TTM offered attractive services at the expense of operational efficiency. It provided wide area services earlier than NTT DoCoMo. It also started free-word services in advance of that company. Therefore, TTM’s operational efficiency has been lower than NTT DoCoMo’s. However, as NTT DoCoMo has started to follow TTM’s strategy, this difference in operational efficiency will diminish.

Marketing and Sales in the Paging Industry

TTM is strong in marketing and sales for personal users. It has focused on young personal users and developed pagers that meet their needs. It has also effectively used TV commercials and train posters as well as advertisements in newspapers and magazines. TTM has even promoted its services through department stores and other more commercially minded outlets.\textsuperscript{5}

In the future, TTM’s advantages in marketing and sales for young personal users will decrease. NTT DoCoMo has already started to develop pagers that target young personal users and TV commercials with young stars. Furthermore, its basic pager service rate was cut to the same level as that of TTM in March, 1996. Although NTT DoCoMo is now following TTM’s strategy, TTM seems to have introduced no new plan to differentiate
itself from NTT DoCoMo. Unless TTM introduces some new measures, its current advantages in marketing and sales for young personal users will diminish in the near future.

**Overall Assessment of TTM**

Figure 7-21 summarizes the overall competitive position of TTM in respect to NTT DoCoMo.

**Figure 7-21 TTM’s Overall Competitive Assessment**

<table>
<thead>
<tr>
<th>Overall Assessment</th>
<th>High Weakness</th>
<th>Mild Weakness</th>
<th>Even</th>
<th>Mild Strength</th>
<th>High Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managerial Infrastructure</td>
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<tr>
<td>Finance</td>
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<tr>
<td>Human Resource Management</td>
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<tr>
<td>Technology</td>
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<td>Procurement</td>
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<tr>
<td>Operations</td>
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<tr>
<td>Marketing and Sales</td>
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<tr>
<td>Overall Assessment</td>
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</tbody>
</table>

**7.4 Summary**

The business scope and unique competencies of each carrier are investigated using the internal scrutiny method of Arnoldo C. Hax and Nicolas S. Majluf. Based on the results,
we have examined the generic competitive strategies of each competitor. We have also shown the strengths and weaknesses of each competitor based on an analysis of each category in the value chain.

**Generic Competitive Strategies of Each Competitor**

Figure 7-22 shows each competitor's competitive advantage and market scope according to service type. Figure 7-23 shows each competitor's competitive advantage and market scope in terms of end users. Finally, Figure 7-24 shows each competitor's competitive advantage and market scope in its distribution channels.

**Figure 7-22 Competitive Advantage and Market Scope (Services)**

<table>
<thead>
<tr>
<th>Services</th>
<th>Competitive Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication</td>
<td>Lower Cost</td>
</tr>
<tr>
<td>NTT DoCoMo</td>
<td>TIM</td>
</tr>
<tr>
<td>Information Access</td>
<td>NTT DoCoMo</td>
</tr>
</tbody>
</table>

**Figure 7-23 Competitive Advantage and Market Scope (End Users)**

<table>
<thead>
<tr>
<th>End Users</th>
<th>Competitive Advantage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Users</td>
<td>Lower Cost</td>
</tr>
<tr>
<td>NTT DoCoMo</td>
<td>TIM</td>
</tr>
<tr>
<td>Personal Users</td>
<td>Lower Cost</td>
</tr>
<tr>
<td>NTT DoCoMo</td>
<td>TIM</td>
</tr>
</tbody>
</table>
Although TTM focuses on personal users, both carriers have a broad market scope. As for competitive advantage, NTT DoCoMo enjoys cost leadership because its group operates throughout Japan. On the other hand, TTM will continue to use differentiation strategies to increase its attractiveness. For these reasons, the suggested strategy of NTT DoCoMo is overall cost leadership, whereas that for TTM is one of differentiation. Figure 7-25 shows the generic competitive strategies of both carriers.

**Figure 7-25 Generic Competitive Strategies of the Two Carriers**

<table>
<thead>
<tr>
<th>Competitive Advantage</th>
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<tbody>
<tr>
<td></td>
<td>Lower Cost</td>
</tr>
<tr>
<td>Market Scope</td>
<td></td>
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<tr>
<td>Broad</td>
<td>NTT DoCoMo</td>
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<tr>
<td>Narrow</td>
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</tbody>
</table>

**Strengths and Weaknesses of Each Competitor**

Here we summarize each competitor’s unique competencies by listing its strengths and weaknesses.

**NTT DoCoMo**

*Strengths*

- Strong in technological capability.
- Strong in its marketing for business users.
• Strong in the potential information providers of its group companies.

Weaknesses
• Weak in its marketing for personal users.
• Weak in responding to user needs.

TTM
Strengths
• Strong in its marketing for personal users.
• Strong in responding to user needs.
• Strong in the potential information access services of main shareholders.

Weaknesses
• Weak in its marketing for business users.
• Weak in technological capability.
Chapter 8

Internal Scrutiny of the Pager Industry

As of 1994, total sales of pagers was ¥70,500 million. Among other manufacturers, NEC Corporation (NEC), Matsushita Communication Industrial Co. Ltd. (Matsushita), Casio Computer Co. Ltd. (Casio), Kokusai Electric Co. Ltd. (Kokusai), and Motorola, Inc. (Motorola) had large market shares in the pager industry. Figure 8-1 shows the market share of each company in fiscal 1994.

Figure 8-1  Market Share in the Paging Device Industry (Fiscal 1994)

Source: Fuji Kimera

In this paper, we have chosen four companies – NEC, Matsushita, and Casio – as well as Motorola, which is the world’s leading pager provider, as the relevant competitors.
In addition to these companies, Sharp Corporation (Sharp) may also become a relevant competitor in the future. On January 31, 1995, NTT DoCoMo selected Sharp as one of the companies to work on the joint development of devices for a high-speed paging system that it plans to market.¹ As it is strong in electronic diaries, PDA, and PHS devices, Sharp may also demonstrate strength in the integrated device market.

As a result, NEC, Matsushita, Casio, Motorola, and Sharp are regarded as the most relevant competitors in the pager industry.

Although our main focus is the pager industry, we have included some information about the systems equipment industry. This is because systems equipment businesses sometimes influence the strategies of pager businesses.

8.1 NEC Corporation

NEC is an international electronics manufacturer, supplying communications systems and equipment, computers, industrial electronic systems, and electronic devices. NEC operates primarily in a single industrial segment which it calls C&C; this originally meant "the integration of computers and communications." In 1995, its net sales and net income were ¥3,769,357 million and ¥35,316 million, respectively. Figure 8-2 shows its net sales by each business segment in fiscal 1994.
Figure 8-2 NEC’s Net Sales by Business Segment in Fiscal 1994


Product Scope in the Mobile Communications Market

NEC will put a higher priority on systems equipment than on devices in the future. NEC produces a wide range of products from devices to base equipment. Devices for mobile communications are now more often consumer electronics products than they are professional communications devices. Although NEC also produces consumer electronics, it is not so strong in the consumer electronics industry. On the other hand, NEC has a competitive advantage in systems equipment. NEC has been one of the main suppliers of NTT’s switching systems, and the technology of NTT’s switching systems is critical in the development of systems equipment connected to them. Therefore, it is expected that NEC will shift its priorities to systems equipment in the future.

Among the three mobile communications systems, NEC will put a higher priority on its rapidly growing cellular and PHS systems than on its paging systems. Although the
annual growth rate of the paging service industry is more than 10%, the annual growth rate of the cellular service industry is more than 100%, and PHS is also growing rapidly.

In conclusion, it is expected that NEC will put a higher priority on the systems equipment of rapidly growing cellular and PHS systems. Figure 8-3 shows NEC's projected priorities in its current and future product scope.

**Figure 8-3** NEC's Product Scope Priorities

<table>
<thead>
<tr>
<th>Products</th>
<th>Devices</th>
<th>Systems Equipment</th>
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</thead>
<tbody>
<tr>
<td>Systems</td>
<td></td>
<td></td>
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<tr>
<td>Paging</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>Cellular</td>
<td>E</td>
<td>++</td>
</tr>
<tr>
<td>PHS</td>
<td>E</td>
<td>++</td>
</tr>
<tr>
<td>PDA Communicators</td>
<td>E</td>
<td></td>
</tr>
</tbody>
</table>

**Market Scope in the Mobile Communications Market**

In device markets, NEC will continue to focus on both NTT DoCoMo and NCCs. As a leading telecommunications equipment company, NEC produces devices on paging, cellular, and PHS systems for NTT DoCoMo and NCCs. In addition, it was selected as one of the suppliers of pagers and systems equipment for the FLEX-TD protocol-based high speed paging systems made by NTT DoCoMo and NCCs. As it has a strong relationship with both of these companies, it will continue to focus on both of them.

As for end users, it will continue to focus on both business and personal users. In the past, NEC was strong in marketing and sales for business users because of its broad in-house telecommunications systems. Currently, the percentage of personal users among the mobile communications industry's new subscribers is increasing. For this reason, NEC is also developing products that target personal users. As NEC already has strengths in
product development for business users, it will keep focusing on both business and personal users.

As for its distribution channels, NEC will put more importance on its OEM supply. Because of the deregulation of device sales to end users, it is expected that manufacturer brand sales will increase. However, consumer electronics companies are strong in their distribution channels and marketing for manufacturer brand sales. In addition, stronger competition is expected in manufacturer brand sales because of the entrance of many consumer electronics companies. On the other hand, NEC is already strong in its OEM supply to carriers because of its technological credibility and a long-standing relationship with them. Therefore, NEC will put a higher priority on its OEM supply than on its manufacturer brand sales.

As for systems equipment, it is strong in equipment that targets both NTT DoCoMo and NCCs. For example, NEC was selected by NTT DoCoMo and NCCs as one of the suppliers of systems equipment for its high-speed paging system. It will, therefore, continue to focus on both NTT DoCoMo and NCCs. Figure 8-4 shows NEC’s expected priorities in its current and future market scope.

**Figure 8-4 NEC’s Market Scope Priorities**

<table>
<thead>
<tr>
<th>End Users</th>
<th>Products</th>
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</thead>
<tbody>
<tr>
<td><strong>Carriers</strong></td>
<td><strong>Devices</strong></td>
</tr>
<tr>
<td>• NTT DoCoMo</td>
<td>E</td>
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<tr>
<td>• NCCs</td>
<td>E</td>
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<table>
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<tr>
<th>Distribution Channels</th>
<th><strong>Devices</strong></th>
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<tbody>
<tr>
<td>• OEM</td>
<td>E</td>
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<tr>
<td>• Manufacturer Brands</td>
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</tbody>
</table>
Managerial Infrastructure

NEC has a clear focus on computers and communications. In 1977, NEC introduced the concept of C&C. Since that time, C&C has become a key concept in NEC's entire business domain. NEC's main line of business is the development of technology, focused mainly on C&C, and the marketing of C&C products.

Technology in the Paging Industry

NEC has a wide breadth of technology in the paging industry. It has supplied a broad range of pagers, including card-type pagers, and paging systems equipment to carriers. Finally, it makes several key components in pagers, because it is the world's largest supplier of semiconductor chips. Therefore, it has a wide horizontal and vertical range of technologies in the paging industry.

In addition to technologies for current pagers, NEC has the technology necessary to develop future integrated devices. It has produced a prototype for an integrated mobile computing device, which has a telephone, a fax, an electric organizer, and an E-mail function with liquid crystal display, as shown in Figure 8-5. Although it is still difficult to use because of its interface, it has almost all necessary functions in a single small body.

Figure 8-5 Integrated Devices
One concern of NEC is its focus on C&C. In developing integrated devices, user interface technologies will become critical. The development of easy-to-use interface software, in addition to sophisticated hardware, would become necessary because it does not have electronic organizers or PDAs.

Manufacturing in the Paging Industry

The flexible manufacturing line of NEC will enable NEC to adapt quickly to customer needs. In 1994, NEC expanded its manufacturing line of pagers in Japan. The old automated line now produces a small variety and large quantity of pagers for foreign markets. On the other hand, the new line, called “cell manufacturing line” produces a large variety of pagers for the domestic market. Currently, NEC produces about 50 types of pagers for foreign and domestic markets. In order to increase its flexibility, NEC relies mainly on manual labor in the new cell line. Each cell of about 40 people is managed as an independent company which is responsible for its manufacturing process. By making each cell responsible for its performances, NEC also aims to improve efficiency and product quality. This flexibility in its manufacturing line will be one of NEC’s strengths in the diversification of its product mix.4

Marketing and Sales in the Paging Industry

NEC will maintain its strength in the carrier market. It has an established relationship with carriers, because it has consistently been one of the main suppliers of telecommunications equipment and devices. Because of its high-quality products, carriers have a strong brand loyalty for NEC. This established relationship and the brand loyalty of carriers will assure that NEC remains a main carrier supplier.

In addition, NEC shows strengths in its targeting of personal users. It produces pagers for various end users. For example, “The Senty-D Pager” for NTT DoCoMo, shown in Figure 8-6, can display twenty illustrations, including five moving pictures. There is also “The Mola Pager” for NCCs, shown in Figure 8-7, which has a unique form designed after a “fish head.” Both of them are very popular among young personal users.
A joint project with Sanrio Co. will increase NEC’s marketing strength among young personal users. Sanrio, which is based in Tokyo, is Japan’s largest character goods company. It has a character named “Kitty” which is popular with young women. NEC will offer its telecommunications technology, while Sanrio will provide know-how in creating character goods. This joint project will provide NEC with advantages in attracting such young female users as junior and senior high school students.
One concern of NEC is the recent deregulation of the telecommunications market, which has enabled individuals to buy pocket pagers instead of leasing them. The brand name image of NEC is not as strong as that of other consumer electronics companies, such as Sony and Sharp. One of the new challenges for NEC would be to create a strong brand name in addition to its reputation among domestic telecommunications carriers.

**Overall Competitive Assessment**

Figure 8-8 summarizes the overall competitive position of NEC in relation to its competitors.

**Figure 8-8  NEC's Overall Competitive Assessment**

<table>
<thead>
<tr>
<th>Overall Assessment</th>
<th>High Weakness</th>
<th>Mild Weakness</th>
<th>Even</th>
<th>Mild Strength</th>
<th>High Strength</th>
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<td>Marketing and Sales</td>
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<td>Overall Assessment</td>
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195
8.2 Matsushita Communication Industrial Co., Ltd. (Matsushita)

Matsushita was established in 1958, by separating the communications equipment, business-use car-mount AV equipment, and electronic measuring equipment divisions from the Matsushita Electric Industrial Co., Ltd. Matsushita currently concentrates on four business sectors. These are telecommunications, professional audio-visual equipment, car-electronics, and public-use systems. In fiscal 1994, its net sales and net income were ¥524,072 million and ¥6,816 million, respectively. Figure 8-9 shows its net sales by each business segment in fiscal 1994.

Figure 8-9 Matsushita's Net Sales by Business Segment in Fiscal 1994

Product Scope in the Mobile Communications Market

Matsushita will increase its priorities on cellular and PHS systems. Matsushita produces a wide range of products in the communications market. These include systems equipment and devices for paging, cellular, and PHS systems. In fiscal 1994, its net sales in the telecommunications sector increased 7.3% because of "the continued growth of communication network systems sales and the increase in domestic demand for cellular phones and system equipment for PHS." Matsushita has also introduced an in-house cordless phone system based on PHS technology. This system can be used as a PHS cordless phone when it is used off the premises as well. This indicates the importance of the cellular and PHS systems for Matsushita.

In addition, Matsushita will put a higher priority on systems equipment in the future. Because of the entrance of other consumer electronics companies into the cellular and PHS device industries, the profitability of these industries, especially the cellular device industry, is declining. Matsushita, therefore, is gradually shifting its focus from devices to systems equipment.

In conclusion, it is expected that Matsushita will put a higher priority on its PHS system products and its systems equipment. Figure 8-10 shows Matsushita’s anticipated priorities in its current and future product scope.

Figure 8-10 Matsushita’s Product Scope Priorities

<table>
<thead>
<tr>
<th>Products</th>
<th>Devices</th>
<th>Systems Equipment</th>
</tr>
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<tbody>
<tr>
<td>Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Paging</td>
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<td>E</td>
</tr>
<tr>
<td>• Cellular</td>
<td>E</td>
<td>+</td>
</tr>
<tr>
<td>• PHS</td>
<td>+</td>
<td>++</td>
</tr>
<tr>
<td>PDA Communicators</td>
<td>E</td>
<td></td>
</tr>
</tbody>
</table>
Market Scope in the Mobile Communications Market

As for carriers, Matsushita will assign priority both to NTT DoCoMo and to NCCs. It was selected as one of the suppliers of pagers for the FLEX-TD protocol-based high-speed paging system by NTT DoCoMo and NCCs. It was also selected by NCCs as one of the suppliers of systems equipment for a high-speed paging system.\textsuperscript{1,2} It will, therefore, keep its focus on both NTT DoCoMo and NCCs.

As for end users, it will continue to focus on both business and personal users. Traditionally, Matsushita has been strong in marketing for and sales to business users because of its in-house telecommunications systems. Because of the rapid increase of personal users in the mobile communications market, however, Matsushita will also prioritize personal users. Therefore, it will have priorities on both business and personal users.

As for distribution channels, Matsushita will employ the same strategy as NEC. Matsushita, like NEC, is strong in its OEM supply to carriers because of its technological credibility and strong relationship with them. In addition, Matsushita is an established systems provider because of its high-quality systems not just because of a consumer electronics manufacturer. It will, therefore, continue to focus on its OEM supply until carriers make some greater effort to increase manufacturer-brand device sales to end users. Figure 8-11 shows Matsushita’s projected priorities in its current and future market scope.
Figure 8-11 Matsushita’s Market Scope Priorities

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<th>Products</th>
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<td>• NTT DoCoMo</td>
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<td>• Manufacturer Brands</td>
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Managerial Infrastructure

Matsushita has focused on communications industries. It is focusing primarily on the areas of telecommunications, professional audio-visual equipment, car-electronics, and public-use systems. In the telecommunications sector, it provides paging, cellular, PHS, and cordless devices for personal and business uses. The net sales of the communications sector are Matsushita’s largest, 46% of its total net sales. Also the domestic sales of the telecommunications sector have been growing at about 20% per year recently. These facts indicate a strong managerial commitment to the domestic telecommunications market. Figure 8-12 shows Matsushita’s net sales by telecommunications Sector.
One concern for Matsushita is a project management among group companies. Matsushita Electric is a well-known Japanese consumer electric company which manufactures wide variety electronics technologies and products. Whenever Matsushita wants to develop new devices by integrating consumer electronics technologies and communications technologies, it has to coordinate the task with Matsushita Electric.

Technology in the Paging Industry

Matsushita has widespread technology in the paging industry. It has always been one of the main suppliers of pagers to carriers. Traditionally, NTT reserved 60% of its equipment purchases for NEC and Matsushita. This indicates the strong presence of Matsushita in this industry. In addition to pagers, it has also been one of the leading suppliers of paging
systems equipment. It has, therefore, a horizontally wide range of technologies in the paging industry.

Matsushita relies upon group companies for the development of semiconductor chips, new batteries, and consumer electronics related products. It has, therefore, a vertically wide range of technologies in its group.

Matsushita was quick to develop an integrated paging and PHS device. This device supplements the weakness of PHS in its service area. If this device is outside the PHS service area, it automatically receives information through the paging system.$^{10}$

In its development of electronic organizers and PDAs, Matsushita has not been aggressive. Therefore, if it were to develop integrated devices with large LCDs, it would take longer than its competitors, Sharp and Casio.

**Manufacturing in the Paging Industry**

Matsushita has a low cost factory with high productivity. It has constructed this factory for the production of pagers and cellular phones, and the factory began production in October, 1991. Because of the expansion of lines, its production capacity for pagers has increased from 250,000 to 350,000 units per month.$^{11}$ This is as big as that of NEC. The factory is fully automated and produces about 200,000 units for export; the rest are for domestic sales.

One of the characteristics of this factory is the youthfulness of its employee. The average age of the employees is 27 years old. With its new equipment and a growing market, this factory has succeeded in achieving a rapid increase in productivity at a lower cost.$^{12}$
Marketing and Sales in the Paging Industry

Matsushita excels in marketing to carriers. It has a strong relationship with carriers because, like NEC, it has always been one of the main suppliers of telecommunications equipment and devices.

A successful venture of Matsushita’s, in cooperation with NTT DoCoMo, is “The Palfy V Pager," shown in Figure 8-13. In August 1992, Matsushita started to supply Palfy series pendant-type pagers to NTT DoCoMo. This 47 mm x 47 mm x 9.9 mm square pager, designed jointly by Matsushita and NTT DoCoMo, was launched targeting female users. It is still on the sales and leases list although the life cycle of many pagers is becoming shorter and shorter. The success of this joint venture with NTT DoCoMo shows the strong relationship between Matsushita and NTT DoCoMo, as well as Matsushita’s product development capability for personal users.

Figure 8-13 The Palfy V Pager
Overall Competitive Assessment

Figure 8-14 summarizes the overall competitive position of Matsushita in relation to its competitors.

**Figure 8-14 Matsushita’s Overall Competitive Assessment**

Overall Assessment

- Managerial Infrastructure
- Finance
- Human Resource Management
- Technology
- Procurement
- Manufacturing
- Marketing and Sales
- Overall Assessment

8.3 Casio Computer Co., Ltd. (Casio)

Casio was founded by Mr. Casio in 1953. Casio currently concentrates on four business sectors. These are Electronic Calculators and Personal Data Equipment, Electronic Timepieces, Electronic Musical Instruments, and Data Processing Systems. Electronic Calculators and Personal Data Equipment include calculators, label printers, LCD digital cameras, word processors, and digital diaries. The LCD digital camera QV-10, which was introduced in February 1995, was one of Casio’s most successful products in 1995,
because of its segmentation at the low end. The digital diary with a wireless infrared link is an electronic diary with a wireless communicator. Figure 8-15 shows Casio's digital diary for kids.

Figure 8-15 Digital Diary Picky Talk

Casio’s electronic Timepieces include digital watches and pagers. Its electronic musical instruments include digital pianos, keyboards, and audio equipment. Finally, its data processing systems include car navigation systems and LCD devices. In fiscal 1994, its net sales and net income were ¥401,675 million and ¥5,026 million, respectively. Figure 8-16 shows its net sales by each business segment in fiscal 1994.
Product Scope in the Mobile Communications Market

Casio produces pagers and PHS devices for the mobile communications market. It started producing pagers in 1987. It also began production of a PHS device in 1995. As for cellular devices, it has not yet announced any plans to enter this market. It would be difficult for Casio to enter the analog device market at this time, because this would require analog telecommunications technology. However, Casio could enter the digital cellular device market because it is strong in digital technology. As for systems equipment, that is out of Casio's product scope. Therefore, Casio currently focuses on pager and PHS devices. It also has potential for entering the digital cellular device industry.

One of the characteristics of Casio is its strategy for creating integrated products. Unlike NEC or Matsushita, Casio originally operated in the area of digital diaries and from this, expanded into telecommunications by producing pagers. In order to differentiate its
products from those of its competitors, Casio says, "we are constantly looking for ways to integrate products - adding digital diary functions to pagers, or using a pager card to add communication capabilities to our Personal Digital Assistant." Figure 8-17 shows one example of Casio's integrated pagers.

**Figure 8-17 The NICOTO Pager**

Casio also wants to provide pagers for future FM paging services. Casio was the first producer of FM Visual Information Receivers. In April, 1995, thirty-three commercial stations throughout Japan started broadcasting information on FM radio using the data radio channel (DARC) format. To capitalize on this new broadcast medium and also to apply DARC reception to automotive and portable audiovisual equipment, Casio has developed the first device available for this new medium. It also seeks to supply devices for FM paging services which are expected to start using FM frequencies. Casio says, "Casio intends to be an early participant in the development of devices and equipment."
In conclusion, Casio is focused on expanding in telecommunications devices. It seeks to develop integrated devices to differentiate its products. It also seeks to become a first mover and catch new opportunities. Figure 8-18 shows Casio’s anticipated priorities in its current and future product scope.

**Figure 8-18 Casio’s Product Scope Priorities**

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<th>Products</th>
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<td>PDA Communicators</td>
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**Market Scope in the Mobile Communications Market**

As for carriers, Casio will keep its focus on NCCs to keep its high market share in NCCs. Casio supplied pagers only to NCCs until it started to supply pager-- to NTT DoCoMo in 1995. As Casio already has large share in NCCs, its main focus will stay on NCCs. In order to increase its total market share in the pager device market, however, it will use its resources to get a greater market share in NTT DoCoMo.

As for end users, Casio will put a higher priority on personal users than on business users. The company says, “With unique functions and product concepts, we are expanding our product lineup for various lifestyles and consumer groups. We are also helping businesses increase creativity and productivity with advanced communications equipment.” “[The outright sales of pagers to consumers] will promote the diversification of pager devices to meet the full range of consumer demands, from low-priced products to high-end, value-added pagers with functions of a digital diary.” Therefore, its main strategy is diversification with unique functions and product concepts. One example of Casio’s unique concept is its products for kids. It produces digital watches, electronic musical
instruments, digital diaries, label printers, and word processors for kids. Casio acquired proficiency in product concept technology for personal use, especially for young users, through this kind of product development.

As for its distribution channels, Casio would focus both on OEM and manufacturer brand sales. The company says, “As the cost of renting pagers from carriers is fairly low, substantial growth in sales to consumers is not expected in the near term.” “While meeting the increasingly diversified needs of pager users, Casio intends, through OEM production, to continue to use the substantial marketing power of the telecommunication carriers.”

In conclusion, although Casio has advantages in manufacturer brand sales, the low rental costs and substantial marketing power of carriers prevents it from focusing on manufacturer brand sales in the near future. Figure 8-19 shows Casio’s projected priorities in its current and future market scope.

**Figure 8-19 Casio’s Market Scope Priorities**

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<td>• Manufacturer Brands</td>
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**Managerial Infrastructure**

Casio’s management has a strong focus on the product area of telecommunications and multimedia. It knows that technological innovations and deregulation are giving rise to
new communications media. In view of this, Casio has established a strategy for popularizing multimedia with innovative products.

One of Casio's concerns is the concentration of managerial power in the Casio family. Since its foundation, Casio has been led by the four Casio brothers, and currently, three out of four representative directors are members of the Casio family. It will, therefore, have to prepare for a smooth transferal of leadership to non-family members.

**Technology in the Paging Industry**

Casio is not strong in basic wireless communications technology. It has been in the pager industry since 1987. Although it has enough application technology for pagers, it is not a telecommunications equipment company and does not have competitive technology in telecommunications. It also lacks the technology for systems equipment. In the pager industry, Casio has signed a licensing agreement with Motorola for a FLEX™ high-speed pager standard to compensate for its lack of base technologies.\(^{15}\)

On the other hand, Casio does have strengths in the technology of digital diaries and LCDs. It has been one of the main producers of electronic organizers. With these technologies, Casio has the potential to develop various integrated devices, such as pagers with digital diaries. Another Casio's strengths are its LCD device technologies. LCD technologies and LCD application technologies will become necessary for developing integrated devices or pagers with large displays. Casio acquired strength in both LCD devices and the application of them through the development of LCD related products, such as calculators, digital diaries, digital watches, word processors, digital cameras, and LCD projection TVs.

In conclusion, although Casio is not strong in wireless communications technology, it has experience in the technologies of digital diaries and LCDs. It has the potential, therefore, to differentiate products by integrating them.
Manufacturing in the Paging Industry

One of the Casio’s strengths in production technology is mounting technology. It acquired cost-competitive mounting technologies through the development of electronic calculators. When it competed with Canon in the electronic calculator industry, it won with its cost-competitive mounting technology. In the pager industry, it developed a card pager, "Techno Joker," with a 6.2mm thickness. It also developed a digital diary with a thickness of only 7.8mm. These demonstrate Casio’s strength in device mounting technology.

Marketing and Sales in the Paging Industry

Casio is strong in its marketing power for NCCs. It has supplied its pagers to NCCs exclusively since it first launched its pager in 1987. As it has 16% market share from sales to NCCs, its marketing for NCCs is strong. On the other hand, its marketing for NTT DoCoMo is relatively weak. It started to supply NTT DoCoMo in 1996. Since it has been selected by NTT DoCoMo as one of its high-speed pager suppliers, Casio has the potential to increase its marketing power for NTT DoCoMo by developing differentiated pagers.¹

One of Casio’s weaknesses comes from its lack of systems equipment technology. Although Casio produces attractive pagers for the current infrastructure, it can not make proposals which include modifications of systems equipment. Its ability to differentiate its pagers will be highly affected by the strategies of carriers. Therefore, it will face some difficulties in differentiating its pagers in the future.

Overall Competitive Assessment

Figure 8-20 summarizes the overall competitive position of Casio as compared with its competitors.
Figure 8-20 Casio's Overall Competitive Assessment

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8.4 Motorola, Inc. (Motorola)

Motorola, founded in 1928 as the Galvin Manufacturing Corporation, is the world’s leading provider of wireless communications. The current businesses of Motorola are divided into four major sectors: General Systems; Semiconductor Products; Messaging, Information and Media; and Land Mobile Products. The General Systems Sector includes cellular phones and systems, personal communications systems, computers, and microcomputer boards. The Semiconductor Products Sector includes microprocessors, RF devices, microcontrollers, digital signal processors, memories, and sensors. The Messaging, Information and Media Sector includes pagers and paging systems, wireless and wireline data communications products, and handwriting recognition software. The Land Mobile Products Sector includes analog and digital two-way radio products and
systems. In 1995, its net sales and net income were $27,037 million and $1,781 million, respectively. Figure 8-21 shows its net sales by each business segment in 1995.

**Figure 8-21** Motorola’s Net Sales by Business Segment in 1995


During the 1980s, Motorola went through a long and difficult process to enter the Japanese telecommunications market. First, it had lengthy negotiations with NTT over the sale of pagers. At the beginning of the 1980s, Motorola was the lowest-cost, highest-volume producer of pagers in the world. It was not able to compete with Japanese prices, however, because NTT established a price which was higher than the one that Motorola was prepared to bid. Motorola then engaged in long negotiations with NTT to gain a share of the market at that price. Next, it became involved in trade disputes between the US and Japan when trying to enter the cellular phone market. In 1986, there were three cellular phone protocols in Japan. MPT decided that NTT would be allowed to operate throughout Japan and in each region, and that one additional company would be allowed to compete with NTT. As a result, market access for Motorola’s protocol was limited. To get a larger
market access, Motorola went through a long trade dispute between the US and Japan. After this long dispute, Motorola finally increased its presence in Japan. Currently, its sales in Japan represent 8% of its worldwide sales. Figure 8-22 shows Motorola's market sales by region in 1995.

**Figure 8-22** Motorola's Market Sales by Region in 1995

![Pie chart showing market sales by region: United States 37%, Europe 23%, Asia-Pacific 12%, China/Hong Kong 12%, Japan 8%, Rest of World 8%]


**Product Scope in the Mobile Communications Market**

Motorola focuses on cellular and paging systems in the mobile communications industry.

As for pagers, it will put a higher priority on the development of high-speed pagers. Motorola has been a supplier of pagers for both NTT DoCoMo and NCCs. In the new FLEX-TD based protocol system, Motorola is one of the suppliers of pagers for both NTT DoCoMo and NCCs. Since it has advantages as a developer of the FLEX™ protocol, it will assign a greater priority to the development of pagers for the new protocol.
As for systems equipment, it will also put a higher priority on the development of systems equipment for the high-speed paging system. When TTM was established in 1987, it ordered more than half of its POGSAG protocol-based system from Motorola. At that time, because of the difference of the paging frequencies between the two countries and because of the smaller size of systems equipment manufactured in Japan, Motorola used an OEM supplied by Toshiba and Matsushita.\textsuperscript{17} Because it has an advantage as the developer of the FLEX\textsuperscript{TM} protocol, however, it will put a higher priority on the development of systems equipment for the high-speed paging system.

As for its cellular phone systems, Motorola would focus on both digital cellular phones and digital systems in the future. Motorola has regularly supplied systems equipment and cellular phones to NCCs. Currently, according to the rapid growth of the cellular industry, carriers are investing aggressively in digital cellular infrastructure. As a supplier of systems equipment and cellular phones, Motorola would focus on digital cellular infrastructure and a digital cellular phone. Figure 8-23 shows Motorola's anticipated priorities in its current and future product scope.

**Figure 8-23 Motorola's Product Scope Priorities**

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<th>Products</th>
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<td>• Paging</td>
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<td>• Cellular</td>
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<td>• PHS</td>
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<td>PDA Communicators</td>
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**Market Scope in the Mobile Communications Market**

In the device market, it would focus on both NTT DoCoMo and NCCs. Currently, Motorola produces pagers and cellular phones for both NTT DoCoMo and NCCs. As the
world's leading company both of pagers and cellular phones, it will continue to focus on both groups.

As for end users, Motorola would focus on personal users. In the business user segment, domestic telecommunications systems companies, such as NEC and Matsushita, have advantages in providing a total telecommunications system, because they have a PHS system, which will become a substitute for in-house telecommunications system. For this reason, Motorola would focus on personal users.

As for distribution channels, Motorola would focus on OEM supply. Although Motorola has brand recognition as a microprocessor and cellular phone manufacturer, its brand image is not as strong as that of other consumer electronics companies. For that reason, it would focus on OEM supply rather than on manufacturer brand sales.

In the systems equipment market, it would put more emphasis on NCCs than on NTT DoCoMo. As for systems equipment for NCCs, Motorola has been one of the main suppliers for both cellular and paging systems. On the other hand, it could not supply systems equipment to NTT DoCoMo because domestic companies, such as NEC and Matsushita, have strong relationships with NTT DoCoMo. Therefore, although it is going to supply FLEX-TD system equipment to NTT DoCoMo, it would maintain its focus on NCCs.

Figure 8-24 shows Motorola's anticipated priorities in its current and future market scope.
Figure 8-24 Motorola’s Market Scope Priorities

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<th>Products</th>
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<td>Manufacturer Brands</td>
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Managerial Infrastructure

The management of Motorola is known for its matrix organization. It has both regional management and business area management. These two management lines make up its matrix organization. Regional managers think locally and solve specific regional issues while business area managers act globally to enhance the company’s economies of scale.18 This managerial coordination is one of the strengths of Motorola as a global telecommunications company.

Motorola is also known for its emphasis on learning. In 1995, Motorola spent more than $150 million on corporate education, offering at least forty hours of training to each of its 132,000 workers.19 Through this intense training and education program, it has achieved continuous improvement in its operations always creating new managers and leaders to support its continuous growth.20

Finally, it is known for its innovative culture. In formulating its business strategies, it revises its technology roadmap every year. This roadmap is a vision of business from the point of technology and is effective for Motorola because it operates in those business areas
where technology advances rapidly. In addition to this technology roadmap, Motorola has a minority report system. In minority reports, employees are expected to say what is on their minds, even if it runs counter to management’s policies. This system has enabled Motorola to find many innovative opportunities, such as its 68000 microprocessor series and its satellite-based communication system IRIDIUM®.\textsuperscript{18, 21} In conclusion, Motorola is minimizing its disadvantage as a foreign company through matrix organization.

**Technology in the Paging Industry**

Motorola has broadest range of technologies in its paging systems. First of all, it has developed a FLEX\textsuperscript{TM} protocol-based system. This system enables communications to change transmission speeds according to frequencies of use. Secondly, it developed a ReFLEX\textsuperscript{TM} protocol for data messaging and two-way wireless messaging. Motorola has also developed a Tango\textsuperscript{TM} pager based on this protocol which was adopted by SkyTel for its two-way paging service.\textsuperscript{22} The Tango\textsuperscript{TM} pager is shown in Figure 8-25. Thirdly, it has developed an InFLEXion\textsuperscript{TM} protocol for voice paging services. Motorola has also developed a Tenor\textsuperscript{TM} pager based on this protocol which will become available in 1996, along with the inauguration of PageNet's voice-paging service.\textsuperscript{22} Finally, it has developed a Envoy\textsuperscript{©} personal wireless a communicator, which is a PDA with communicator. This enables people to exchange electronic mail messages or to access information wherever they are.

In addition, Motorola also is pushing the development of NewsCard\textsuperscript{©} one- and two-way modems in the PCMCIA format. Motorola plans to introduce a family of PCMCIA wireless modems covering three product categories: one-way wide-area networking, two-way wide area networking, and two-way local-area networking.\textsuperscript{23} This enables PCs to receive paging information.

In conclusion, Motorola has a broad range of technology in protocol and in the paging systems. In addition, it has acquired a technological base in personal wireless communicators through the development of the Envoy\textsuperscript{©} PDA.
Manufacturing in the Paging Industry

Motorola has high quality and a high productivity system in pager manufacturing. When Motorola set new quality and productivity goals for its paging business, its Bandit Pager team traveled around the world looking for new technologies. They visited the best-known manufacturers of cars, watches, cameras, and other technology-intensive products, and combined know-how from Honda, Seiko, and others with its own expertise to build a new production line.\(^{24}\) In addition, they combined Motorola's skillful manufacturing with fast customer response. As a result, it can now deliver a custom-made pager in under 48 hours.\(^{25}\)

Motorola also has expertise in quality control. It is known for its "Six Sigma" quality control. Statistically, this means only 3.4 defects per million. In 1994, it acquired the first
annual Malcolm Baldrige National Quality Award. Named for Reagan's late Secretary of Commerce, the award recognizes companies, or divisions of companies, "that attain preeminent quality leadership." This indicates Motorola's focus on quality control activities.

In conclusion, Motorola has high quality, productivity, and flexibility in the manufacturing of pagers. Its expertise in quality control will strengthen them even more.

**Marketing and Sales in the Paging Industry**

Motorola's carrier marketing power will increase in the future. In 1996, NTT DoCoMo and NCCs plan to offer FLEX-TD protocol-based services. For this purpose, Motorola was selected as one of the suppliers of systems equipment and pagers. As it has expertise in a FLEX™ protocol-based system, its relationship with carriers will increase. This in turn will strengthen its marketing power for carriers in systems equipment and pagers.

Nonetheless, Motorola will have to improve its marketing power for personal users. Motorola, which does not have an in-house telecommunications system, has weaker marketing power for business users than NEC or Matsushita. It would, therefore, have to focus on personal users in the future. According to carriers, however, Motorola was late in focusing on personal users, especially young women. In order to the capture growing number of personal users, it will have to develop pagers that target personal users.

Finally, it will have to improve its retail marketing. Although it is anticipated that Motorola's relationship with carriers will increase with the introduction of the FLEX-TD system, other companies such as NEC and Matsushita will maintain their own strong relationships with them. Therefore, Motorola would have to put a higher priority on manufacture brand sales in the future. Unfortunately, its brand recognition is not as strong as that of such consumer electronics companies as Casio and Sharp. In the US, Gary Tooker, the CEO of Motorola, realized the need to focus on marketing and hired John Pepper, the chief executive of Procter & Gamble, as a board member. Motorola is also
busily hiring people with experience selling consumer goods. In order to succeed in Japan, Motorola needs additional marketing help for that country.

In conclusion, although it is expected that Motorola’s marketing power to carriers will increase in the future, it will need to acquire marketing skills targeting personal users and manufacturer brand sales.

**Overall Competitive Assessment**

Figure 8-26 summarizes the overall competitive position of Motorola in relation to its competitors.

**Figure 8-26 Motorola’s Overall Competitive Assessment**
8.5 Sharp Corporation

Sharp, founded in 1912, is the world leader in liquid crystal displays (LCDs), and has developed innovative, consumer-focused products such as ViewCam™ LCD camcorders, Zaurus™ keyboard-enhanced PDAs, fully featured notebook computers, Sharp Vision™ LCD projection systems, Wizard® electronic organizers, audio and video systems, and appliances and office automation products. Figure 8-27 shows the market share of Sharp in innovative products related to LCDs and multimedia.

Figure 8-27 Market Share of Sharp's Innovative Products (Fiscal 1994)

[Bar chart showing market share for Mini-Disc (37%), PHS Devices (40%), LCD (44%), LCD ViewCam (63%), and PDA (70%).]


In addition to these innovative products, Sharp offers one of the broadest and most advanced available lines of consumer electronics, business products and electronic components. Currently, Sharp operates in five business sectors: Television and Video Equipment, Audio and Communications Equipment, Home Appliances, Office and Industrial Equipment, and Electronic Components. In fiscal 1994, its net sales and net
income were ¥1,617,000 million and ¥44,508 million, respectively. Figure 8-28 shows its net sales by each business segment in fiscal 1994.

**Figure 8-28** Sharp's Net Sales by Business Segment in Fiscal 1994


Sharp is known for its focus on multimedia. President Tsuji of Sharp stated that its focus is on "personal, home and vehicle multimedia" in his 1994 New Year's message. Home multimedia is the system that controls in-house electronics, such as air conditioning systems, door locks, lights, and utilities. It seeks to control either with wired or wireless systems. Car multimedia is a multimedia vehicle system with navigational electronics installed in the car and interactive telecommunications. One of Sharp's biggest targets is the VICS (Vehicle Information & Communication System), which is an electronic car navigation system with telecommunication begun in Tokyo in April 1996. The last one, personal multimedia is the one in which Sharp has the most strength and focus. One of its future target is the development of ViewCam™-telecommunications which enable people to communicate with moving pictures over long distances. Another is pen-style mobile
communicators with a flexible screen that transmits and receives messages. Through these developments, Sharp seeks to shift society from its current centralized massmedia information systems to individual multimedia systems that enable people to communicate interactively with anyone, anywhere, anytime.

**Product Scope in the Mobile Communications Market**

Sharp produces paging, cellular, and PHS devices in the mobile communications market. It started marketing paging and PHS devices in 1995. Before this production of PHS devices, its presence in the mobile communications device market was small. Because Sharp began with consumer electronics, not telecommunications equipment, it does not produce any systems equipment. One of the reasons for its focus on PHS devices may be the replacement of cordless telephones in houses with PHS cordless telephones.

In the pager industry, Sharp currently focuses on providing integrated devices. In 1995, Sharp launched its “Paging Talk” pager that has an electronic diary, shown in Figure 8-29. In addition to receiving messages, it can organize information and generate tones to send messages.

**Figure 8-29 The Paging Talk Pager**
In the future, Sharp will focus on integrated devices which utilize its LCD and electronic organizer technologies. Sharp has developed Zaurus™ PDA with a built-in modem and a tone generator for sending messages to pagers. It also plans to add pager functions with the use of a PC paging card. In addition, Sharp announced that it would develop devices and multimedia applications for the mobile communications and PDA sectors with Alcatel Telecom of France.³¹ These products will combine Alcatel's GSM technology with the flat screen and interface technologies that Sharp uses in its range of electronic organizers.

In conclusion, Sharp focuses on the development of PDAs with built-in communication devices to expand multimedia. It also seeks to become a market leader in the PHS device market. Figure 8-30 shows Sharp's anticipated priorities in its current and future product scope.

**Figure 8-30** Sharp's Product Scope Priorities

<table>
<thead>
<tr>
<th>Products</th>
<th>Devices</th>
<th>Systems Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Paging</td>
<td>E</td>
<td>- -</td>
</tr>
<tr>
<td>• Cellular</td>
<td>E</td>
<td>- -</td>
</tr>
<tr>
<td>• PHS</td>
<td>+</td>
<td>- -</td>
</tr>
<tr>
<td>PDA Communicators</td>
<td>++</td>
<td></td>
</tr>
</tbody>
</table>

**Market Scope in the Mobile Communications Market**

Sharp will put more importance on NTT DoCoMo than on NCCs. Sharp is currently seeking to develop new markets using its PDA technologies. Although Sharp has introduced its Paging Talk through NTT DoCoMo, either NTT DoCoMo or NCCs will do for this purpose. Its successful product in a PHS device was also an OEM to NTT Personal. In addition, Casio, which also targets development of integrated devices, already has a strong relationship with NCCs. Therefore, Sharp will probably place more importance on NTT DoCoMo than on NCCs.
Sharp will focus on both business and personal users. In the development of Zaurus™ PDA, Sharp has targeted both business users and personal users. Many companies such as insurance companies and banks have introduced Zaurus™ to increase the performance of sales people. At the same time, more than 20% of all high school students have electronic organizers. Therefore, it will emphasize both business and personal users.

As for distribution channels, Sharp will place more emphasis on manufacturer brand sales than competitors. In 1995, Sharp launched Paging Talk with its own name on it. This was the first case in which a pager was sold with a manufacturer's name on it. As one of the leading consumer electronics company, Sharp is strong in its distribution channels. It also has strong brand recognition for its electronic diary, PDA, and in its multimedia market. Therefore, although Sharp will continue to use the substantial marketing power of telecommunications carriers for the time being, it will place more importance on manufacturer brand sales. Figure 8-31 shows Sharp's anticipated priorities in its current and future market scope.

**Figure 8-31 Sharp's Market Scope Priorities**

<table>
<thead>
<tr>
<th>Products</th>
<th>Devices</th>
<th>Systems Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Carriers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• NTT DoCoMo</td>
<td>+</td>
<td>--</td>
</tr>
<tr>
<td>• NCCs</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td><strong>End Users</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Business Users</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>• Personal Users</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td><strong>Distribution Channels</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• OEM</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>• Manufacturer Brands</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>
Managerial Infrastructure

Sharp has a creative atmosphere and a positive attitude to challenges. Sharp’s business creed is "Sincerity and Creativity." Sharp defines them as follows:

\begin{quote}
Sincerity is a virtue fundamental to humanity... always be sincere.
Harmony brings strength... trust each other and work together.
Politeness is a merit... always be courteous and respectful.
Creativity promotes progress... remain constantly aware of the need to innovate and improve.
Courage is the basis of a rewarding life... accept every challenge with a positive attitude.
\end{quote}

Source: Sharp Corporation *Eighty Years of Sincerity and Creativity* (Japan: Sharp Corporation, 1992) 0.

With these principles, Sharp is constantly seeking innovation and improvements.

The strong leadership of President Tsuji is one of Sharp’s strength for developing innovative products. Mr. Idei, President of Sony says, “I pay attention to President Tsuji of Sharp. I think his leadership is the key success factor in the development of successful products through trans-divisional projects.” His emphasis on customer satisfaction is also a key factor in the success of this innovative product development. Some industry members have actually witnessed President Tsuji disguised as a sales person selling Zaurus™ at a retail store. This is a good example of how much importance he places on customers.

In conclusion, Sharp has a challenging and creative corporate culture. It also has the strong leadership of President Tsuji, which enables it to develop innovative products through trans-divisional projects.
Technology in the Paging Industry

Sharp is not strong in basic wireless communications technology. Although Sharp is a market leader in the PHS device market, it has a limited wireless communications technology because it was never a telecommunications equipment company. It is also anticipated that Sharp will not have an extensive wireless communications technology in the pager industry.

Although Sharp lacks strength in wireless communications technology, it has technological advantages in flash memories. Flash memory is a non-volatile, rewritable data storage medium combining the functions of RAM and ROM, and is a key component of pagers, cellular phones, PHS handsets, and PDAs. Sharp obtained the technology for flash memories from Intel under a licensing agreement in 1992,\textsuperscript{34} and is now one of the leading producers, supplying a portion of Intel's requirements as well as meeting the needs of its own customers worldwide. It develops flash memories according to the Intel architecture and fabricates them using Sharp's 0.55 micron ETOX\textsuperscript{TM} process technology.\textsuperscript{35}

In addition, Sharp has technological advantages in LCDs. Sharp began developing LCDs in 1973 for the use of calculators. Currently, Sharp develops numerous innovative multimedia products with its LCD technologies. One example of Sharp's state-of-the-art LCD technology is its thin, full-color LCD TVs in both 8.4-inch and 10.4-inch models. These are about three times brighter than most PC displays.\textsuperscript{33} If pagers are to have bigger displays or color displays to meet multimedia needs, Sharp will have a distinct advantage.

Another Sharp's advantage is its technology for creating a PDA. Sharp is the market leader in PDAs. The new Zaurus\textsuperscript{TM} PI-7000 has a built-in fax modem, computer network access software, an infrared link, a message sending function for pagers, and a connector for digital cellular phones. This device has a great potential of as an integrated device if users shift to non-voice communications.

Finally, Sharp has built a 21-story multimedia research center in Makuhari, Tokyo.\textsuperscript{30} This shows its commitment to the future of multimedia.
In conclusion, although Sharp does not have advantages in telecommunications technology, it has technological advantages in flash memory, and this is one of the key components of mobile devices. It also has strong advantages in LCD and PDA technologies, which are expected to become critical in the production of integrated devices. Therefore, Sharp has a strong enough technological potential to become one of the main players in the integrated device industry.

Manufacturing in the Paging Industry

The manufacturing technology of Sharp in the pager industry is unknown, because it did not enter the pager industry until 1995. It will have to produce large numbers of pagers before it can reach cost leadership.

Marketing and Sales in the Paging Industry

Marketing and sales power in the pager industry is currently low. Because Sharp launched its first pager in 1995, it does not have a strong appeal to carriers. If, however, the carriers were to seek to introduce information access services using integrated devices, Sharp would have greater marketing power because of its technological advantages in PDAs.

One problem for Sharp is its lack of systems technology. When carriers do seek to introduce new services using integrated devices, they will need to renew their systems equipment. In such a situation, Sharp would not be able to get the information exclusively. Instead, it would have to compete with companies that have wide product lines, such as NEC, Matsushita, and Motorola.

Overall Competitive Assessment

Figure 8-32 summarizes the overall competitive position of Sharp in relation to its competitors.
8.6 Summary

The business scope and unique competencies of each device manufacturer are investigated here using the internal scrutiny method. Based on the results, we determine the generic competitive strategies of each competitor. We also provide an assessment of strengths and weaknesses for each competitor based on our analysis of each category in the value chain.

**Generic Competitive Strategies of Each Competitor**

Figure 8-33 shows each competitor's competitive advantage and market scope in relation to carriers. Figure 8-34 shows each competitor's competitive advantage and market scope in relation to end users. Figure 8-35 shows each competitor's competitive advantage and market scope in relation to distribution channels.
### Figure 8-33 Competitive Advantage and Market Scope (Carriers)

<table>
<thead>
<tr>
<th>Carriers</th>
<th>NTT DoCoMo</th>
<th>NEC</th>
<th>Matsushita</th>
<th>Motorola</th>
<th>Sharp</th>
<th>(Casio)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NEC</td>
<td>Matsushita</td>
<td>Motorola</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCCs</td>
<td></td>
<td>NEC</td>
<td>Matsushita</td>
<td>Motorola</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Figure 8-34 Competitive Advantage and Market Scope (End Users)

<table>
<thead>
<tr>
<th>End Users</th>
<th>Business Users</th>
<th>NEC</th>
<th>Matsushita</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Business Users</td>
<td>NEC</td>
<td>Matsushita</td>
</tr>
<tr>
<td>Personal Users</td>
<td>NEC</td>
<td>Matsushita</td>
<td>Casio</td>
</tr>
<tr>
<td>Personal Users</td>
<td>NEC</td>
<td>Matsushita</td>
<td>Sharp</td>
</tr>
<tr>
<td>Personal Users</td>
<td>NEC</td>
<td>Matsushita</td>
<td>Casio</td>
</tr>
</tbody>
</table>

### Figure 8-35 Competitive Advantage and Market Scope (Distribution Channels)

<table>
<thead>
<tr>
<th>Distribution Channels</th>
<th>OEM</th>
<th>NEC</th>
<th>Matsushita</th>
<th>Motorola</th>
<th>Casio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribution Channels</td>
<td>OEM</td>
<td>NEC</td>
<td>Matsushita</td>
<td>Motorola</td>
<td>Casio</td>
</tr>
<tr>
<td>Manufacturer Brand</td>
<td>(NEC)</td>
<td>Matsushita</td>
<td>(Motorola)</td>
<td>Sharp</td>
<td></td>
</tr>
</tbody>
</table>

According to Figures 8-33 through 8-35, NEC, Matsushita, and Motorola all have a broad market scope. At the same time, they have cost leadership. On the other hand, Casio and
Sharp focus on narrower market scope than NEC, Matsushita, and Motorola. At the same time, they seek to differentiate themselves through PDA technologies. Figure 8-36 shows the overall competitive advantage and market scope of each company.

**Figure 8-36 Generic Competitive Strategies of Device Manufacturers**

<table>
<thead>
<tr>
<th>Market Scope</th>
<th>Competitive Advantage</th>
</tr>
</thead>
</table>
| Broad        | Lower Cost | NEC  
               |            | Matsushita  
               |            | Motorola  
               |            | Narrow        | Casio  
               |            | Sharp  |

As shown in Figure 8-36, the generic competitive strategies of NEC, Matsushita, and Motorola focuses on “overall cost leadership,” because they have a broad market scope and cost leadership.

As for Casio and Sharp, their basic strategy is one of differentiation, and they are more focused than NEC, Matsushita, and Motorola. Their generic competitive strategy is “differentiation and focus.”

**Strengths and Weaknesses of Each Competitor**

Here we summarize each competitor’s unique competencies by listing strengths and weaknesses.

**NEC**

*Strengths*

- Very strong in its marketing for and sales to carriers.
- Very strong in its marketing for and sales to business users.
- Very strong in the systems equipment industry.
• Strong in the product development for personal users.

Weaknesses
• Weak in the development of PDAs with paging functions.

Matsushita
Strengths
• Strong in its marketing for and sales to carriers.
• Strong in its marketing for and sales to business users.
• Strong in its marketing for and sales to personal users.
• Strong in the systems equipment industry.
• Very strong in brand recognition.

Weaknesses
• Weak in the development of pagers for personal use.
• Weak in the development of PDAs with paging functions.

Casio
Strengths
• Strong in its marketing for and sales to NCCs.
• Strong in its marketing for and sales to personal users.
• Very strong in the development of pagers for young personal users.
• Strong in the development of PDAs with paging functions.

Weaknesses
• Weak in telecommunications systems technology.
• Weak in its marketing for and sales to business users.
• Weak in its marketing for and sales to NTT DoCoMo.
Motorola

Strengths

- Very strong in wireless telecommunications technologies.
- Strong in the development of PDAs with paging functions.

Weaknesses

- Weak in its marketing for and sales to business and personal users.
- Weak in the development of pagers for personal use.
- Weak in brand identification.

Sharp

Strengths

- Very strong in the development of PDAs.
- Very strong in the marketing and sales of PDAs for business and personal users.
- Strong in the brand recognition.

Weaknesses

- Weak in its marketing for and sales to carriers.
- Weak in telecommunications systems technology.
Part IV

Strategic Recommendations

In Part IV, we provide suggested business strategies for each competitor in the paging industry. In Part I, we provided an industry overview of the mobile communications market in Japan. In Part II, we provided an environmental scan of the mobile communications market and a detailed five-force framework of the paging industry to determine its attractiveness. In Part III, we outlined the business scopes of each competitor in the mobile communications market. Then, we provided an internal scrutiny of the paging industry to identify the competitive strengths of each competitor. Thus, in all we have provided an "Outline of the Japanese Mobile communications Market," an "Environmental Scan," and an "Internal Scrutiny," as shown in Figure 1-2. In this part, we wish to suggest business strategies for each competitor based on the findings in the former parts.

Chapter 9

Business Strategy for Paging Carriers

In this chapter, we provide business strategy for each paging carrier. First, we introduce our methodology for the formulation of a business strategy. Then, in the following sections, we define a business strategy for NTT DoCoMo and TTM.
9.1 Methodology for the Formulation of a Business Strategy

In this section, we explain the methodology we are using for the formulation of a business strategy for each competitor.

First, we examine each competitor in terms of the Attractiveness – Strength Matrix. We then indicate generic strategies for each competitor, and suggest business priorities. Next, we define broad action programs for each competitor. In doing this, we take into account several results of former analyses. These are opportunities and threats identified in the environmental scan, as well as generic competitive strategies, and the strengths and weaknesses of each competitor. We then define specific action programs which will support each broad action program.

Position in the Attractiveness – Strength Matrix

We start this stage with a broad understanding of all of the relevant issues – external as well as internal – that are central to the enhancement of business performance.

We summarize our output in the environmental scan and internal scrutiny using the Industry Attractiveness – Business Strength Matrix, presented in Figure 9-1. This matrix is a graphic indication of industrial attractiveness and business strength.
Figure 9-1  Industry Attractiveness – Business Strength Matrix


The first implication of this positioning is the direction of change that the business is expected to face during the planning horizon being considered. The second implication is the suggestion for a generic strategy, which is a course of action that is appropriate for industrial attractiveness and business strength. The nine generic strategies associated with the matrix are presented in Figure 9-2.
Figure 9-2  Generic Strategies Associated with the Industry Attractiveness – Business Strength Matrix

<table>
<thead>
<tr>
<th>INDUSTRY ATTRACTION</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BUSINESS STRENGTH</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>Grow Seek Dominance Maximize investment</td>
<td>Identify growth segment's Invest strongly Maintain position elsewhere</td>
<td>Maintain overall position Seek cash flow Invest at maintenance level</td>
</tr>
<tr>
<td>Medium</td>
<td>Evaluate potential for leadership via segmentation Identify weaknesses Build strengths</td>
<td>Identify growth segments Specialize Invest selectively</td>
<td>Prune lines Minimize investment Position to divest</td>
</tr>
<tr>
<td>Low</td>
<td>Specialize Seek niches Consider acquisitions</td>
<td>Specialize Seek niches Consider exit</td>
<td>Trust leader's statesmanship Sic on competitors' cash generators Time exit and divest</td>
</tr>
</tbody>
</table>


**Suggested Business Priority**

A final inference from the Industry Attractiveness – Business Strength Matrix is the suggested business priority. This indicates business priorities for resource investment.
Eight strategic business priorities make up a list of priorities consistent with the position of a business unit in the matrix.

**Strategic Business Priorities**

- **Build aggressively:** The business is in a strong position in a highly attractive, fast-growing industry, and management wants to build shares as rapidly as possible. This role is usually assigned to an SBU early in the life cycle, especially when there is little doubt as to whether this rapid growth will be sustained.

- **Build gradually:** The business is in a strong position in a very attractive, moderate-growth industry, and management wants to build share, or there is rapid growth but doubt as to whether or not this rapid growth will be sustained.

- **Build selectively:** The business has a good position in a highly attractive industry and wants to build shares where it feels it has strength, or can develop strength to do so.

- **Maintain aggressively:** The business is in a strong position in a currently attractive industry, and management is determined to maintain that position aggressively.

- **Maintain selectively:** Either the business is in a strong position in an industry that is becoming less attractive, or the business is in a moderate portion in a highly attractive industry. Management wishes to exploit the situation by maximizing the profitability benefits of selectively serving where it best can, but with minimum additional resource deployments.

- **Prove viability:** The business is in a less-than-satisfactory position in a less attractive industry. If the business can provide resources for use elsewhere, management may decide to retain it, but without additional resource support. The onus is on the business to justify retention.

- **Divest-Liquidate:** Neither the business nor the industry has any redeeming features. Barring major exit barriers, the business should be divested.

- **Competitive harasser:** This is a business with a poor position in either an attractive or a highly attractive industry, where competitors with a good position in the industry also compete with the company in other industries. The role of a competitive harasser is to attack sporadically or continuously the competitor’s position, not necessarily with the
intention of long-run success. The objective is to distract the competition in other areas, deny them revenue business, or use the business to cross-parry when the competition attacks an important sister business of the strategic aggressor.


**Definition of Broad Action Programs**

At this stage, we formulate a business strategy for each competitor considering opportunities and threats emerging in the environmental scan and strengths and weaknesses identified from the internal scrutiny. We define the full set of broad action programs, which cover all opportunities, threats, strengths, and weaknesses for each competitor.

**Definition of Specific Action Programs**

Each broad action program is supported by a set of specific action programs. Specific action programs are tactics while broad action programs are strategies. Specific action programs are short-term tasks that can be precisely identified, monitored, and evaluated.
9.2 NTT Mobile Communications Network, Inc. (NTT DoCoMo)

Position in the Attractiveness – Strength Matrix

According to the environmental scan and the internal scrutiny, the position of NTT DoCoMo will shift from “high” to “medium” industrial attractiveness while maintaining “medium” business strength. This position gets the following recommendations from Figure 9-2: identify growth segments, specialize, invest selectively.

Figure 9-3 NTT DoCoMo’s Position in the industry Attractiveness – Business Strength Matrix
Suggested Business Priority

According to the position of NTT DoCoMo in Figure 9-3 and the strategic business priorities shown in the first section of Chapter 9, its suggested business priority is one of selective maintenance – “maintain selectively.”

Definition of Broad Action Programs

First, we list the opportunities and threats that emerge from the environmental scan. Next, we list the generic competitive strategy, strengths, and weaknesses that emerge from the internal scrutiny. Then, we define its broad and specific action programs.

Opportunities

• Growth opportunity in non-voice message communication.
• Growth opportunity in information access service.
• Increasing device differentiation to raise the value of paging services.
• Decreasing market share volatility from pager sales.

Threats

• Increasing rivalry from over capacity.
• High substitutability of calling-up services by PHS.
• High substitutability of non-voice message communications by PHS and E-mail.
• Lack of a de facto standard for information access with paging services.
• Increasing dependence on device features.

Generic Competitive Strategy

• Overall cost leadership.
**Strengths**

- Strong in technological capability.
- Strong in its marketing for business users.
- Strong in the potential information providers of its group companies.

**Weaknesses**

- Weak in its marketing for personal users.
- Weak in responding to user needs.

**Broad Action Programs**

1. Increase the length of receivable messages.
   Growth opportunity in non-voice message communication services depends on information quantity. In addition, growth opportunity in information access services depends on information quantity. NTT DoCoMo can increase communication and information quantity by increasing the length of a message that users can receive at one time. Specifications have to be set with systems equipment suppliers and device manufacturers.

2. Develop E-mail receiving functions.
   Growth opportunity in information access services depends on accessibility to growing E-mail users. NTT DoCoMo can increase its attractiveness by linking its paging service to E-mail service. Since sending all information, including an attached file, is not economically feasible, the company should decide linkage formats at the outset. Linkage formats have to be set with computer network service providers, other paging carriers, and device manufacturers.

3. Develop a two-way communication through an alliance with PHS.
   Growth opportunity in non-voice communication depends on the information quantity. NTT DoCoMo can increase information quantity by introducing a two-
way communication. The deliberations of MPT would be necessary to introduce this service.

4. Introduce information access services using group companies.
   The growth opportunity in information access services depends on the quality and quantity of information available. NTT DoCoMo can increase information quantity by introducing information access services.

Definition of Specific Action Programs

We here list the specific action programs that would support the broad action programs of NTT DoCoMo.

1. **Increase length of receivable messages.**

   *Modify paging systems with systems equipment suppliers.*
   NTT DoCoMo would have to decide specifications with systems equipment suppliers and device manufacturers. NEC would be the best partner to decide specifications and to modify the system.

   *Prompt device manufacturers to develop pagers with large displays.*
   Pagers with large displays are necessary when reading long messages. In addition, pagers with easy-to-use message composition functions are necessary for composing long messages. NTT DoCoMo would have to prompt all of its device suppliers as well as Sharp to develop this kind of pagers.

   *Prompt device manufacturers to develop PDAs with built-in paging functions.*
   PDAs with built-in paging functions are desirable for receiving long messages. This would decrease the threat of substitution of PDAs with built-in PHS for pagers. Sharp’s Zaurus™ would be the most desirable PDA for increasing the attractiveness of NTT DoCoMo’s service.
2. Develop E-mail receiving standards.

*Formulate a standard with computer network service providers, other paging carriers, and device manufacturers.*

NTT DoCoMo would have to get other companies to form an E-mail linkage standard to alleviate the potential dominant power of PDAs with PHS as a mobile E-mail device. NTT DoCoMo has the strongest leadership among paging carriers because of its technological capability and economies of scale of its group. The new standard should be available to all companies in the paging industry to decrease the power of PHS.

*Modify its paging system with systems equipment suppliers.*

It has to modify its system to comply with the standard. NEC would be the best partner to decide specifications and to modify systems.

*Include device manufacturers for the development of this service.*

Pagers with a large display are necessary for reading long messages. NTT DoCoMo would have to prompt all of its device suppliers to develop this kind of pagers. It also has to discourage device manufacturers from developing PDAs with PHS as a mobile E-mail receiver. In order to do this, NTT DoCoMo must include all potential developers of PDAs with PHS in the development of this system.

*Establish E-mail receiving functions as quickly as possible.*

In order to make this a *de facto* standard for mobile E-mail receivers, NTT DoCoMo has to establish its services before the PHS system. A paging system has the advantage of receiving messages automatically, while PHS system requires information inquiry. It should acquaint users with its usefulness as an automatic receiver and increase their switching costs.

*Encourage NCCs to start E-mail linkage services.*

In order to discourage device suppliers for NCCs from developing PDAs with PHS as a mobile E-mail receiver, it would have to encourage NCCs with the technology
to start E-mail linkage services. This would make suppliers for NCCs less motivated to develop PDAs with PHS as a mobile E-mail receiver.

*Prompt device manufacturers to develop PDA with a built-in paging function.*

PDAs with built-in paging functions is desirable for receiving E-mail. This decreases threat of substitution of PDAs with built-in PHS for pagers. Sharp's Zaurus™ would be the most desirable PDA to increase the attractiveness of NTT DoCoMo's services.

*Exploit business users to spread E-mail receiving functions.*

Its large business user base is a potential user of E-mail functions. NTT DoCoMo has to exploit this using its strong marketing power for business users. Aggressive price reduction of devices would be necessary to establish the E-mail receiving functions of pagers as a standard.

3. *Develop a two-way communication through an alliance with a PHS carrier.*

*Formulate a standard with PHS carriers, other paging carriers, and device manufacturers.*

It has to help companies formulate a two-way standard. NTT DoCoMo has the strongest leadership among paging carriers because of its technological capability and economies of scale of its group.

*Negotiate with MPT.*

The deliberation of MPT is necessary to introduce this new service with low service charges.

*Modify the paging system and the PHS system with systems equipment suppliers.*

NTT DoCoMo has to modify its systems, especially its charging system to introduce this service. NEC and Matsushita would make the best partners.
Prompt device manufacturers to develop a two-way pager.

A pager with an easy-to-use sending functions is necessary to spread this service. NEC and Matsushita would again be the best partners.

Exploit its marketing strength for business users.

NTT DoCoMo’s large business-user base is a potential user of a two-way function. NTT DoCoMo has to exploit this using its strong business-user marketing power.

4. Introduce information access services using group companies.

Prompt NTT AD to introduce information access services.

High quality information is necessary to increase the attractiveness of its services. NTT AD, in turn, may have to consider using Dentsu or Hakuhodo as a source of information to increase its information quantity. At the beginning, free service may be necessary to increase popularity.

9.3 Tokyo Telemessage Inc. (TTM)

Position in the Attractiveness – Strength Matrix

According to the environmental scan and the internal scrutiny, the position of TTM will shift from “high” to “medium” industrial attractiveness while maintaining “medium” business strength. This position gets the following recommendations from Figure 9-2: identify growth segments, specialize, invest selectively.
Figure 9-4  TTM's Position in the industry Attractiveness – Business Strength Matrix

INDUSTRY ATTRACTIONENESS

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Current  Future

Suggested Business Priority

According to the position of TTM in Figure 9-4 and the strategic business priorities shown in the first section of Chapter 9, its suggested business priority is one of selective maintenance – "maintain selectively."

Definition of Broad Action Programs

First, we list the opportunities and threats that emerge from the environmental scan. Next, we list the generic competitive strategy, strengths, and weaknesses that emerge from the internal scrutiny. Then, we define its broad and specific action programs.
Opportunities

- Growth opportunity in non-voice message communication.
- Growth opportunity in information access service.
- Increasing device differentiation to raise the value of paging services.
- Decreasing market share volatility from pager sales.

Threats

- Increasing rivalry from over capacity.
- High substitutability of calling-up services by PHS.
- High substitutability of non-voice message communications by PHS and E-mail.
- Lack of a de facto standard for information access with paging services.
- Increasing dependence on device features.

Generic Competitive Strategy

- Differentiation.

Strengths

- Strong in its marketing for personal users.
- Strong in responding to user needs.
- Strong in the potential information access services of main shareholders.

Weaknesses

- Weak in its marketing for business users.
- Weak in technological capability.
Broad Action Programs

1. Increase the length of receivable messages.  
   For the same reason as NTT DoCoMo, TTM can increase its communication and information quantity by increasing the length of messages that users can receive at one time. Specifications have to be decided with systems equipment suppliers and device manufacturers. To differentiate itself from NTT DoCoMo, a longer message capability than that of NTT DoCoMo would be necessary.

2. Develop a two-way communication capability.  
   The growth opportunity among young users depends on the attractiveness of devices. TTM has to exploit the technologies of its suppliers as much as possible to differentiate itself from NTT DoCoMo. Pagers with an infrared link would be the product that attracts high school students.

3. Introduce a chat forum.  
   The threat of substitution of PHS services for paging services among young customers depend on the attractiveness of the paging services offered. TTM can increase the attractiveness of its paging service by introducing a chat forum for those categories that interest young users. This is a kind of information access service for its users.

4. Prompt its main shareholder to introduce information access services.  
   Growth opportunity in information access services depends on the quality and quantity of information. TTM can increase its information quantity by introducing information access services.
Definition of Specific Action Programs

We list specific action programs that support the broad action programs for TTM.

1. Increase the length of receivable messages.

Modify its paging system with its systems equipment suppliers.

TTM has to decide specifications with systems equipment suppliers and device manufacturers. TTM should have capability of longer messages than those of NTT DoCoMo. NEC, Motorola, and Matsushita would be the best partner for deciding specifications and modifying systems.

Prompt device manufacturers to develop pagers with large displays.

Pagers with large displays are necessary for reading long messages. In addition, pagers with easy-to-use message composition functions are necessary for composing long messages. Casio’s digital diary technology is useful for attracting young users.

Prompt device manufacturers to develop PDAs with built-in paging functions.

PDAs with a built-in paging functions are desirable for receiving long messages. This will decrease the threat of substitution of PDAs with built-in PHS for pagers. Casio is the best partner for developing PDAs for young personal users.

2. Develop a two-way communication capability.

Prompt device manufacturers to develop pagers with infrared link.

TTM’s popularity among young personal users depends on the attractiveness of its devices. It can increase its attractiveness by integrating electronic diaries with its pagers. Casio’s electronic diary with an infrared link would be the kind of product that would attract high school students.
Investigate the possibility of NTT DoCoMo's introduction of a two-way paging service.

It would be difficult for TTM to develop a two-way communication standard because of its lack of communications technology and its price-sensitive customer base. For that reason, it has to investigate NTT DoCoMo's possible introduction of a two-way paging service. If NTT DoCoMo should develop one, TTM should try to free-ride the opportunity.

3. Introduce a chat forum.

Examine hot topics among high school students.

TTM itself has to introduce attractive chat forums, such as "gourmet food" or "shopping" to attract young personal users, but TTM does not have to develop the contents by itself. It can rely on high school students as information senders. At the beginning, free service for the chat forum may be necessary.

Prompt device manufacturers to develop pagers with large displays.

Pagers with large displays and memories are necessary to receive and read many messages. In addition, information organizing functions for specific types of information, i.e. mail from friends or messages from the chat forum, would be critical. TTM has to prompt device manufacturers to develop compact pagers with large displays, memories, and message-organizing functions. Casio's mounting technology and development capability for electronic organizers designed for young users would be helpful for this development.

Divide the forum into sub-forums.

After attracting many a lot of users to its forums, TTM should sub-divide forums according to topics and areas to reduce the number of messages each user would receive. It should also introduce a service charge for this service. Service charges related to the amount of service would be possible.
4. Prompt its main shareholder to introduce information access services.

*Prompt Mitsui to introduce information access services.*

High-quality information is necessary to increase the attractiveness of its services. Mitsui currently plans to introduce information access services. At the beginning, free service may be necessary to increase its popularity.

9.4 Summary

Using the Arnoldo C. Hax and Nicolas S. Majluf methodology, a business strategy for each paging carrier has been formulated. Currently, their positions in the Industry Attractiveness – Business Strength Matrix are about the same. In addition, both of them face the same opportunities and threats from environmental changes. Still our recommendations for them are quite different. We have recommended that NTT DoCoMo establish E-mail receiving functions and a two-way communication. This is because both services target business users and require technological capability. They match NTT DoCoMo’s strengths in technological capability and its strengths in marketing for business users. On the other hand, we have recommended that TTM introduce pagers with built-in infrared link and that it establish chat forums. This is because both of these innovations target young personal users and require quick response to their needs. They match up with TTM’s strong response to user needs and its marketing for personal users.

As is clear from each specific action program, these programs require strong support from systems equipment suppliers, pager manufacturers, and/or computer network companies. Therefore, the choice of partners and mutual cooperation become critical issues in the establishment of a sustainable position.
Chapter 10

Business Strategy for Pager Manufacturers

In this chapter, we provide a business strategy for each paging carrier. We define a business strategy for NEC, Matsushita, Casio, Motorola, and Sharp using the methodology introduced in Chapter 9.

10.1 NEC Corporation

Position in the Attractiveness – Strength Matrix

According to the environmental scan and the internal scrutiny, the position of NEC maintains “medium” industrial attractiveness and “high” business strength. This position gets the following recommendations from Figure 9-2: identify growth segments, invest strongly, maintain positions elsewhere.

Suggested Business Priority

According to the position of NEC in Figure 10-1 and the strategic business priorities shown in the first section of Chapter 9, its suggested business priority is one of selective maintenance – “maintain selectively.”

Definition of Broad Action Programs

First, we list the opportunities and threats that emerge from the environmental scan. Next, we list the generic competitive strategy, strengths, and weaknesses that emerge from the internal scrutiny. Then, we define its broad and specific action programs.
Figure 10-1 NEC's Position in the Industry Attractiveness – Business Strength Matrix

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- Current
- Future

Opportunities
- Growth opportunity in pagers with E-mail functions.
- Growth opportunity in pagers with information access functions.
- Growth opportunity through integration with PDAs.
- Growth opportunity through integration with PHS and cellular.

Threats
- Increasing price reduction requirements from buyers.
- Uncertain market growth of the paging service industry.

Generic Competitive Strategy
- Overall cost leadership.
**Strengths**

- Very strong in its marketing for and sales to carriers.
- Very strong in its marketing for and sales to business users.
- Very strong in the systems equipment industry.
- Strong in the product development for personal users.

**Weaknesses**

- Weak in the development of PDAs with paging functions.

**Broad Action Programs**

1. Develop pagers with larger displays and larger memories.
   
   The growth opportunity in pagers with E-mail functions and information access functions creates attractive opportunities for NEC. The attractiveness of these pagers, however, depends on carrier strategies. NEC should develop these pagers so that they can be introduced when the service is first offered.

2. Strengthen an overall cost leadership.
   
   One of the strengths of NEC is its overall cost leadership. It can increase its market share by meeting the price reduction requirements of paging carriers. Since it has the broadest market scope, it has an advantage in promoting cost leadership.

**Definition of Specific Action Programs**

We list specific action programs that support the broad action programs for NEC.
1. Develop pagers with larger displays and larger memories.

*Develop a basic technology for larger displays and memories.*

It is necessary for NEC to develop an LCD technology to prepare for future PDA development. It should include pagers with larger displays as one of targets in its R&D. This would prepare NEC for the development of pagers with E-mail and information access functions. It should also utilize its semiconductor group to develop memories with larger capacities and lower electric consumption.

*Get information about paging carrier strategies through systems equipment channels.*

NEC's strength in the systems equipment industry enables it to get information about paging carrier strategies in advance, because carriers would consult NEC about systems modifications. It should develop, therefore, its pagers reactively to carrier strategies instead of developing them proactively.

2. Strengthen an overall cost leadership.

*Increase economies of scale of its key components through sales to competitors.*

NEC could supply key components or assembled boards to competitors to increase its economies of scale. Through economies of scale and the learning-curve effect, it should aggressively seek to establish an overall cost leadership. This, in turn, would support its manufacturing strengths throughout the market. Consumer electronics companies, such as Sharp, Casio, and Sony, should be the targets for components sales.

*Exploit vertically integrated product scope.*

NEC can lower costs by aggressively exploiting its vertically integrated product scope. Since it is a supplier of ASICs and flash memories, which are key pager components, it should seek to reduce its total cost by increasing the production of these parts. Pager price reductions would give NEC economies of scale that would lead to the cost reductions for these parts.
10.2 Matsushita Communication Industrial Co., Ltd. (Matsushita)

Position in the Attractiveness – Strength Matrix

According to the environmental scan and the internal scrutiny, the position of Matsushita keeps “medium” industrial attractiveness and “high” business strength. This position gets the following recommendations from Figure 9-2: identify growth segments, invest strongly, maintain positions elsewhere.

Figure 10-2 Matsushita’s Position in the industry Attractiveness – Business Strength Matrix

Suggested Business Priority

According to the position of Matsushita in Figure 10-2 and the strategic business priorities shown in the first section of Chapter 9, its suggested business priority is one of selective maintenance – “maintain selectively.”
Definition of Broad Action Programs

First, we list the opportunities and threats that emerge from the environmental scan. Next, we list the generic competitive strategy, strengths, and weaknesses that emerge from the internal scrutiny. Then, we define its broad and specific action programs.

Opportunities

- Growth opportunity in pagers with E-mail functions.
- Growth opportunity in pagers with information access functions.
- Growth opportunity through integration with PDAs.
- Growth opportunity through integration with PHS and cellular.

Threats

- Increasing price reduction requirements from buyers.
- Uncertain market growth of the paging service industry.

Generic Competitive Strategy

- Overall cost leadership.

Strengths

- Strong in its marketing for and sales to carriers.
- Strong in its marketing for and sales to business users.
- Strong in its marketing for and sales to personal users.
- Strong in the systems equipment industry.
- Very strong in brand recognition.

Weaknesses

- Weak in the development of pagers for personal use.
PART IV

- Weak in the development of PDAs with paging functions.

Broad Action Programs

1. Develop pagers with larger displays and larger memories.
   The growth opportunity in pagers with E-mail and information access functions creates attractive opportunities for Matsushita. The attractiveness of these pagers, however, depends on carrier strategies. Matsushita should develop these pagers so that they can be introduced when the service is first offered.

2. Strengthen an overall cost leadership.
   Matsushita is competing with NEC and Motorola for an overall cost leadership. It can increase its market share by meeting price reduction requirements of carriers. Since it has a broad market scope, it would profit from cost leadership over NEC and Motorola.

3. Exploit its group’s distribution channels.
   Matsushita group has the largest distribution channel among consumer electronics companies. By exploiting this, it can increase its presence among personal users.

Definition of Specific Action Programs

We list specific action programs that support the broad action programs for Matsushita.

1. Develop pagers with larger displays and larger memories.

   Develop a basic technology for larger displays and memories.
   It is necessary for Matsushita to develop an LCD technology to prepare for future PDA development. It should include pagers with larger displays as one of targets in its R&D. In some cases, it would be necessary for Matsushita to engage in joint R&D with Matsushita Electric in order to exploit Matsushita Electric’s broad range
of technologies. Since trans-corporate projects take longer, this should be initiated as soon as possible.

*Get information about paging carrier strategies through systems equipment channels.*

Matsushita’s strength in the systems equipment industry enables it to get information about paging carrier strategies in advance, because carriers may consult Matsushita as well as NEC about systems modifications. It should develop, therefore, its pagers reactively to carrier strategies instead of developing them proactively.

2. Strengthen an overall cost leadership.

*Reduce costs of key components.*

Matsushita can lower costs by aggressively focusing on certain key components. Currently, mechanical actuator for the vibrator accounts for large portion of total pager costs. Matsushita Electric is well-known for its low-cost production technology. By focusing on some of its key components, it can lower costs.

*Increase economies of scale of its key components through sales to competitors.*

Matsushita would be able to supply key components or assembled boards to competitors to increase its economies of scale. Through economies of scale and the learning-curve effect, it should aggressively seek to establish an overall cost leadership. To achieve a greater cost leadership than NEC, it should supply to competitors more aggressively than NEC does. Consumer electronics companies, such as Sharp, Casio, and Sony, would be targets for components sales.

3. Exploit its group’s distribution channels.

*Develop pagers for young personal users.*

Matsushita Electric is strong in the development of products that target personal users. Matsushita can utilize this know-how to develop designs that are attractive to personal users and thereby increase its attractiveness for that market.
Utilize its group's distribution channels

It can increase its presence among personal users by exploiting its group's huge distribution channels. Since Matsushita is already strong with business users, this will enhance its strengths.

10.3 Casio Computer Co., Ltd. (Casio)

Position in the Attractiveness – Strength Matrix

According to the environmental scan and the internal scrutiny, the position of Casio will shift from “medium” to “high” business strength while maintaining “medium” industrial attractiveness. This position gets the following recommendations from Figure 9-2: identify growth segments, invest strongly, maintain position elsewhere.

Figure 10-3 Casio’s Position in the Industry Attractiveness – Business Strength Matrix
Suggested Business Priority

According to the position of Casio in Figure 10-3 and the strategic business priorities shown in the first section of Chapter 9, its suggested business priority is one of selective maintenance – “maintain selectively.”

Definition of Broad Action Programs

First, we list the opportunities and threats that emerge from the environmental scan. Next, we list the generic competitive strategy, strengths, and weaknesses that emerge from the internal scrutiny. Then, we define its broad and specific action programs.

Opportunities

• Growth opportunity in pagers with E-mail functions.
• Growth opportunity in pagers with information access functions.
• Growth opportunity through integration with PDAs.
• Growth opportunity through integration with PHS and cellular.

Threats

• Increasing price reduction requirements from buyers.
• Uncertain market growth of the paging service industry.

Generic Competitive Strategy

• Differentiation and focus.

Strengths

• Strong in its marketing for and sales to NCCs.
• Strong in its marketing for and sales to personal users.
• Very strong in the development of pagers for young personal users.
• Strong in the development of PDAs with paging functions.

Weaknesses
• Weak in telecommunications systems technology.
• Weak in its marketing for and sales to business users.
• Weak in its marketing for and sales to NTTs.

Broad Action Programs

1. Develop pagers with larger displays and larger memories.
   The growth opportunity in pagers with information access functions creates attractive opportunities for Casio, but the attractiveness of these pagers depends on carrier strategies. Casio has to investigate carrier strategies by proactively proposing attractive new pagers because it does not have communications systems equipment sector.

2. Develop electronic diaries with paging functions.
   The opportunity for Casio to get a greater market share in the segment that targets young personal users depends largely on the attractiveness of its pagers. Casio can distinguish itself from its competitors by integrating its electronic diaries with its pagers.

Definition of Specific Action Programs

We list specific action programs that support the broad action program for Casio.
1. Develop pagers with larger displays and larger memories.

_Develop new pagers proactively._

Casio can materialize growth opportunities in the non-voice message communication segment by regularly offering pagers with larger displays and memories and with many other functions. Since it does not have a paging systems equipment business, Casio should proactively offer these to carriers. NCCs would provide the best market scope since they have a large personal customer base.

_Exploit the large personal customer base of NCCs._

In order to exploit its own strengths when developing pagers for young personal users, Casio should focus on NCCs. By helping NCCs to distinguish themselves from NTTs with attractive pagers, Casio would be able to differentiate itself from other competitors that are strong with business users. It should try to become the best manufacturer of pagers for young personal users. This in turn would strengthen its relationship with NCCs even more.

2. Develop electronic diaries with paging functions.

_Develop electronic diaries with paging functions._

Casio has the opportunity to increase its market share in the non-voice message communications market. In order to increase the attractiveness of its pagers, it can integrate electronic diaries with them. This would enable Casio to distinguish itself from its competitors in the segment that targets personal users. An infrared link, which enables users to communicate between devices without a network, would further differentiate Casio from its competitors. NCCs would be the potential buyers since they have a large young personal user base.

_Exploit its retail distribution channels._

In addition to the marketing power of its carriers, Casio can exploit retail distribution channels to increase its sales. In the case of electronic diaries with paging functions, it would be able to sell its products through toy stores and
stationery retailers. Through these distribution channels, Casio would be able to strengthen its position among young personal users.

10.4 Motorola, Inc. (Motorola)

Position in the Attractiveness – Strength Matrix

According to the environmental scan and the internal scrutiny, the position of Motorola will shift from “medium” to “high” business strength while maintaining “medium” industrial attractiveness. This position gets the following recommendations from Figure 9-2: identify growth segments, specialize, invest selectively.

Figure 10-4 Motorola’s Position in the industry Attractiveness – Business Strength Matrix
Suggested Business Priority

According to the position of Motorola in Figure 10-4 and the strategic business priorities shown in the first section of Chapter 9, its suggested business priority is proof of viability – “prove viability.”

Definition of Broad Action Programs

First, we list the opportunities and threats that emerge from the environmental scan. Next, we list the generic competitive strategy, strengths, and weaknesses that emerge from the internal scrutiny. Then, we define its broad and specific action programs.

Opportunities

- Growth opportunity in pagers with E-mail functions.
- Growth opportunity in pagers with information access functions.
- Growth opportunity through integration with PDAs.
- Growth opportunity through integration with PHS and cellular.

Threats

- Increasing price reduction requirements from buyers.
- Uncertain market growth of the paging service industry.

Generic Competitive Strategy

- Overall cost leadership.

Strengths

- Very strong in wireless telecommunications technologies.
- Strong in the development of PDAs with paging functions.

Weaknesses

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• Weak in its marketing for and sales to business and personal users.
• Weak in the development of pagers for personal use.
• Weak in brand identification.

**Broad Action Programs**

1. Increase its cost leadership in paging components.
   Motorola could increase its market share by focusing on the supply of components to its competitors. Motorola’s current share is low because of its slow reaction to local needs. Since it has developed a large production capacity for its global operations, it could aggressively lower its component prices by utilizing its economies of scale and the learning-curve effect. Price cuts would further increase its production.

2. Increase its marketing power through an alliance with Japanese companies.
   It would be possible for Motorola to increase its sales of components through an alliance with Japanese companies. Because its marketing is weak, Motorola could use the marketing power of its local partners.

3. Increase its sales of News Card.
   It would be possible for Motorola to increase its sales of News Card, since PC sales are rapidly growing in Japan. An OEM supply to PC companies would be one possible way to do this.

**Definition of Specific Action Programs**

We list specific action programs that support the broad action programs for Motorola.
1. Strengthen its cost leadership in paging components.

*Exploit local companies to improve its response to local needs.*

Motorola could increase its sales by improving its response to local customer needs. One possible way is through an OEM supply to local companies. In this case, it should try to utilize the design capabilities of local companies for improving local customer relations. Potential partners are those who do not have a large capacity for manufacturing pagers. Sharp, Sony, Pioneer, Sanyo, Aiwa, Toshiba, and Fujitsu would be good potential partners.

*Focus on component supply.*

Motorola has cost leadership in components through its global operations. It would, therefore, be possible to increase component sales to local companies. This, in turn, would make Motorola a very strong supplier of components. The potential buyers would be the companies listed above.

*Increase production quantity through price reduction.*

In order to increase its economies of scale, it should increase production of its FLEX-TD protocol-based products. One method for achieving this would be aggressive pricing that would increase its sales. This would increase its learning-curve effect and strengthen its cost leadership.

2. Strengthen its marketing through an alliance with Japanese companies.

*Form an alliance to strengthen its marketing for business users.*

It would be possible to strengthen its marketing for business users and carriers by forming an alliance with Toshiba or Fujitsu. Since both of them have strong marketing power for business users and carriers, this would supplement Motorola’s weakness in its marketing.
Form an alliance to strengthen its marketing for personal users.

It would be possible for Motorola to strengthen its marketing for personal users by forming alliances with Sharp, Sony, Sanyo, Aiwa, and/or Pioneer. Since these companies have strong marketing for personal users, it would supplement Motorola’s marketing weakness.

3. Increase sales of NewsCard®.

Form an alliance with Toshiba.

Increased sales of PCs and the spread of E-mail provide NewsCard® with the opportunity to increase its sales. By forming an alliance with Toshiba, it would be possible to accelerate the sales of NewsCard®. Motorola already has a joint project with Toshiba for the manufacturing of semiconductors. At the same time, Toshiba is a leading manufacturer of note PCs. Since it has a good relationship with Toshiba, it has the potential to increase its sales of NewsCard® through this alliance.

10.5 Sharp Corporation (Sharp)

Position in the Attractiveness – Strength Matrix

According to the environmental scan and the internal scrutiny, the position of Sharp will shift from “low” to “medium” business strength while maintaining “medium” industrial attractiveness. This position gets the following recommendations from Figure 9-2: identify growth segments, specialize, invest selectively.
**Figure 10-5** Sharp's Position in the Industry Attractiveness - Business Strength Matrix

**Suggested Business Priority**

According to the position of Sharp in Figure 10-5 and the strategic business priorities shown in the first section of Chapter 9, its suggested business priority is proof of viability – “prove viability.”

**Definition of Broad Action Programs**

First, we list the opportunities and threats that emerge from the environmental scan. Next, we list the generic competitive strategy, strengths, and weaknesses that emerge from the internal scrutiny. Then, we define its broad and specific action programs.
Opportunities

- Growth opportunity in pagers with E-mail functions.
- Growth opportunity in pagers with information access functions.
- Growth opportunity through integration with PDAs.
- Growth opportunity through integration with PHS and cellular.

Threats

- Increasing price reduction requirements from buyers.
- Uncertain market growth of the paging service industry.

Generic Competitive Strategy

- Differentiation and focus.

Strengths

- Very strong in the development of PDAs.
- Very strong in the marketing and sales of PDAs for business and personal users.
- Strong in the brand recognition.

Weaknesses

- Weak in its marketing for and sales to carriers.
- Weak in telecommunications systems technology.

Broad Action Programs

1. Develop PDAs with built-in paging functions.

   Growth opportunity in E-mail receiving functions will provide Sharp with the opportunity to increase sales of Zaurus™, which is very strong in the PDA industry. If E-mail receiving is available through a paging system, a built-in paging
function in Zaurus™ would increase its attractiveness for business people. This highly differentiated product would provide Sharp with strength in a niche market.

2. Develop electronic organizers with built-in paging functions.
   The growth opportunity for pagers with information access functions would be attractive for Sharp, which is strong in the electronic organizer industry. An electronic organizer with a built-in paging function would attract people who want to receive long messages and organize them with the device. This product would, therefore, have growth potential in the non-voice message communication segment.

Definition of Specific Action Programs

We list specific action programs that support the broad action program for Sharp.

1. Develop PDAs with built-in paging functions.

   *Prompt carriers to establish E-mail receiving services.*
   The advantage for Sharp in integrating a paging function in its Zaurus™ depends largely on the services that its carriers will provide. Since the Zaurus™ is relatively expensive, Sharp should, at first, target business users and personal users at work. Among these users, E-mail receiving functions are becoming increasingly attractive with the spread of E-mail. Sharp should, therefore, prompt carriers to offer E-mail receiving services in exchange for the integration of paging functions.

   *Use externally developed paging components.*
   Sharp is currently differentiating its devices through its PDA technology. Instead of investing in the development of paging components, therefore, it should focus on the development of PDAs. One possible way to do this is to buy components from competitors. It would be then able to choose the most cost-competitive and the smallest components in the industry. Cost-competitive companies, such as NEC, Matsushita, and Motorola could be its potential suppliers.
Exploit the marketing power of carriers.

NTT DoCoMo’s strength in its marketing for business users would provide Sharp with sales growth opportunities for its Zaurus™. In integrating a paging function, it should exploit the marketing power of carriers. An incentive system based on the amount of sales would increase carrier motivation.

2. Develop electronic organizers with built-in paging functions.

Prompt carriers to establish long message services.

The attractiveness of an electronic organizer with built-in paging functions depends largely on the availability of long-message communications. It should, therefore, prompt carriers to initiate long-message services proactively.

Differentiate itself with easy-to-use interface.

Sharp has the advantage in its easy-to-use interface. It should make devices small enough to fit into young women’s pockets but maintain its interface quality. It should, therefore, focus on user interface software technology to differentiate itself from its currently strong competitors, NEC, Matsushita, and Motorola.

10.6 Summary

Using the Arnoldo C. Hax and Nicolas S. Majluf method, a business strategy for each pager manufacturer has been formulated. We have recommended that NEC, Matsushita, and Motorola enhance overall cost leadership, while Casio and Sharp pursue differentiation. This means that NEC, Matsushita, and Motorola would be direct competitors for the overall cost leadership position, and Casio and Sharp would be direct competitors for the differentiation position. At the same time, these two strategic groups would also compete indirectly.

Although NEC, Matsushita, and Motorola would be direct competitors, our specific recommendation for each competitor is different. This is because each one has different
strengths and weaknesses. NEC, which is strong in the systems equipment industry and in its marketing for carriers, would be able to sustain its competitive advantage in the pager industry through reactive development. Matsushita, on the other hand, would have to target cost leadership more aggressively than NEC to have a stronger position than NEC while, at the same time, exploiting its strength in distribution channels. Motorola, which is a global leader in the pager industry, will have to enhance its strength in its overall cost leadership and neutralize its weaknesses in its local marketing. Because the strategic logic of cost leadership usually requires that a firm be the cost leader, not one of several firms vying for this position, some may have to shift to a differentiation strategy to achieve an above-average performance.

As for Casio and Sharp, they will have an opportunity to utilize their strength in electronic organizers and PDAs. Although they will compete directly in this product scope, they can still differentiate themselves from one another by targeting different market scopes. Since, at the present time, Casio has a large market share in this industry and is already targeting a broader market scope, it will face more direct competition from NEC, Matsushita, and Motorola. On the other hand, Sharp will be able to strengthen its position by focusing on PDAs.
Chapter 11

Concluding Remarks

After an overview of the rapidly evolving Japanese mobile communications market, we conducted an environmental scan and an internal scrutiny of the Japanese paging industry based on the Arnoldo C. Hax and Nicolas S. Majluf method. In the environmental scan, identification of external factors contributing to the industry’s attractiveness and an overall assessment of that attractiveness are examined. In the internal scrutiny, identification of internal critical factors to achieve competitive advantage and an overall assessment of the competitive position of each competitor are examined. Based on the identified opportunities and threats to the industry as well as the strengths and weaknesses of each competitor, strategic recommendations for each competitor are then formulated.

Through the environmental scan, several external factors contributing to the industry’s attractiveness are identified. First, the paging industry has growth opportunity in its non-voice message communication segment. The paging industry has evolved from beepers to communicators. It has continued growth potential in the area of communication. Next, the paging industry is threatened by substitutes from the embryonic PHS system. The PHS industry has captured 150 million users in its first 9 months. Its incredibly rapid growth rate, as well as its technological excellence and low service charges are posing strong threats to the paging industry.
Through the internal scrutiny, several critical factors contributing to the competitive position of each competitor are identified. First, each competitor has strengths and weaknesses in different categories of the value chain. Each is competing by exploiting its strengths and supplementing its weaknesses. Secondly, each competitor is taking different generic strategies to sustain unique competencies, and has established a competitive position by means of one of the following strategies: cost leadership, differentiation, and focus.

Because of different strengths and weaknesses, the strategic recommendations for each competitor are sometimes quite different. This corresponds to the goal of the Arnoldo C. Hax and Nicolas S. Majluf method: "A business strategy is a well-coordinated set of action programs aimed at securing a sustainable competitive advantage. These action programs should respond to the desired changes in the business mission, properly address the opportunities and threats revealed by the environmental scanning process, and reinforce the strengths and neutralize the weaknesses uncovered in the internal scrutiny."

Since our sources of information are limited to information available to the public, there may be some differences between what is actually going on in the industry and what we have found. Nonetheless, this method has provided us with a better understanding of the Japanese paging industry and led to what we hope will be some useful strategic recommendations.
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