

**KEYS FOR GROWTH IN
JAPAN'S MATURE MOBILE MARKET**

by

HIROYUKI OTO

B.E., Electrical Engineering, Tohoku University (1991)

SUBMITTED TO THE MIT SLOAN SCHOOL OF MANAGEMENT
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

MASTER OF SCIENCE IN MANAGEMENT OF TECHNOLOGY

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 2005

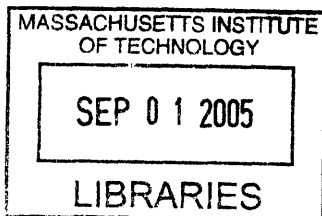
© Hiroyuki Oto 2005. All rights reserved.

The author hereby grants to MIT permission to reproduce and to distribute publicly paper and electronic copies of this thesis document in whole or in part.

Signature of Author: _____
MIT Sloan School of Management
May 6, 2005

Certified by: _____
Michael A. Cusumano
Sloan Management Review Professor of Management
Thesis Advisor

Accepted by: _____
Stephen J. Sacca
Director, Sloan Fellows Program in Innovation and Global Leadership



ARCHIVES

KEYS FOR GROWTH IN JAPAN'S MATURE MOBILE MARKET

by

HIROYUKI OTO

Submitted to the MIT Sloan School of Management
on May 6, 2005 in partial fulfillment of the requirements for
the Degree of Master of Science in Management of Technology

ABSTRACT

The objective of this thesis is to identify key factors that will produce further growth for NTT DoCoMo in Japan's mature mobile market.

Since the early 1990s, the mobile phone market in Japan has grown rapidly, and competition for additional market share resulted in technological innovations like NTT DoCoMo's i-mode service to mobile carriers. Until recently, those innovations had leveraged the growth of the mobile phone industry. However, in 2004 the number of mobile phone subscribers exceeded 85 million and penetration rate reached 66.6%. Under such circumstances, the growth of the mobile carriers is gradually slowing. Moreover, there are threats which have the potential to change the current business model: mobile number portability, flat rate, new entrants, and globalization.

In this thesis, I develop and organize frameworks that can be used by a company to produce further growth in a mature market by using traditional growth models. Then I analyze the sources for growth in mobile market and how the threats affect current dynamics in the mobile market. Finally I examine how the frameworks can work for NTT DoCoMo, and discuss the keys for growth in Japan's mature mobile market.

Thesis Supervisor: Michael A. Cusumano
Title: Sloan Management Review Professor of Management

TABLE OF CONTENTS

	<u>Page</u>
1. Introduction	6
1.1 Thesis Objective.....	6
1.2 Thesis Structure.....	8
2. The Problems of Growth	11
2.1 Why is Continuous Growth Needed for a Company?	11
2.1.1 Shareholders.....	11
2.1.2 Employees.....	12
2.1.3 Society.....	12
2.2 Process of Growth.....	13
2.2.1 S-curve.....	13
2.2.2 Incremental Innovation and Disruptive Innovation.....	15
2.3 Why is Continuous Growth so Difficult?.....	17
2.3.1 Exponential Growth Needed.....	17
2.3.2 How do Large Companies Perform to Achieve Further Growth?.....	19
2.4 Characteristics of a Mature Market.....	20
2.4.1 The Target is “Late Majority and Laggard” Consumers.....	20
2.4.2 Products Become Commodities.....	22
2.4.3 Price Wars.....	22
2.5 Summary.....	23
3. Solutions for Achieving Further Growth	24
3.1 A New Market Innovation That Leverages the Core Business.....	24
3.2 Platform Leadership.....	31
3.3 Concentrated Investing into a Prospective Business.....	33
3.4 Other Solutions.....	35
3.4.1 Geographical Expanding.....	35
3.4.2 Mergers and Acquisitions.....	36
3.4.3 Brand Extension.....	37
3.5 Summary.....	38
4. Trends in the Mobile Communications Market	39
4.1 Technical Trends.....	39
4.2 Penetration Rate.....	41
4.3 Handsets.....	44
4.4 Introduction of 3G Service.....	47
4.5 Alliances.....	48
4.5.1 Vodafone group.....	48
4.5.2 FreeMove.....	49
4.5.3 The Starmap Mobile Alliance.....	49
4.5.4 i-mode alliance.....	49
4.5.5 OMTP group.....	50
4.6 Summary.....	50

5. Structure of Mobile phone industry in Japan	52
5.1 Porter's five forces	52
5.2 Growth dynamics of the mobile industry in Japan	60
5.2.1 Profit dynamics model	60
5.2.2 Customer growth dynamics	62
5.2.3 Product functionality dynamics	63
5.2.4 Service functionality dynamics	64
5.2.5 System dynamics model of the current mobile industry in Japan	65
5.3 Strategies of key players.....	67
5.3.1 Product functionality	67
5.3.2 Product price.....	68
5.3.3 Communication charges	69
5.3.4 Service functionality.....	70
5.3.5 Service quality	72
5.4 Threat	73
5.4.1 Mobile number portability.....	73
5.4.2 Flat rate.....	75
5.4.3 New entrants.....	76
5.4.4 Globalization	77
5.6 Summary	78
6. Applying the frameworks to NTT DoCoMo	80
6.1 Innovative organization	80
6.1.1 Source of new ideas.....	80
6.1.2 Hidden liabilities	82
6.2 Platform leadership.....	83
6.2.1 Keep current platform leadership	83
6.2.2 Creating new platform leadership	84
6.3 Concentrated investing in prospective business	85
6.4 Summary	86
7. Conclusion	88
Bibliography	90

ACKNOWLEDGEMENTS

My thesis project as a member of the MIT Sloan Fellows Program in Innovation and Global Leadership is the culmination of twelve years of experience in the business world. Discussions with professors and friends at MIT helped me gain broader perspectives and provided opportunities to enhance my talents. I would never have been able to accomplish this task without them.

I would like to express my sincere thanks and appreciation to my thesis supervisor, Professor Michael A. Cusumano for his remarkable direction of my thesis and his able assistance throughout my research activities.

I'm much obliged to Mr. Stephen J. Sacca, for his great coordination and work on behalf of the Sloan Fellows Program in Innovation and Global Leadership.

Last but not least, I would like to thank my dearest wife, Tomoko, and my beloved daughter, Nijiho, for their cooperation and kind assistance — with my great gratitude.

Hiroyuki Oto
Cambridge, Massachusetts
May 2005

Chapter 1

Introduction

1.1 THESIS OBJECTIVE

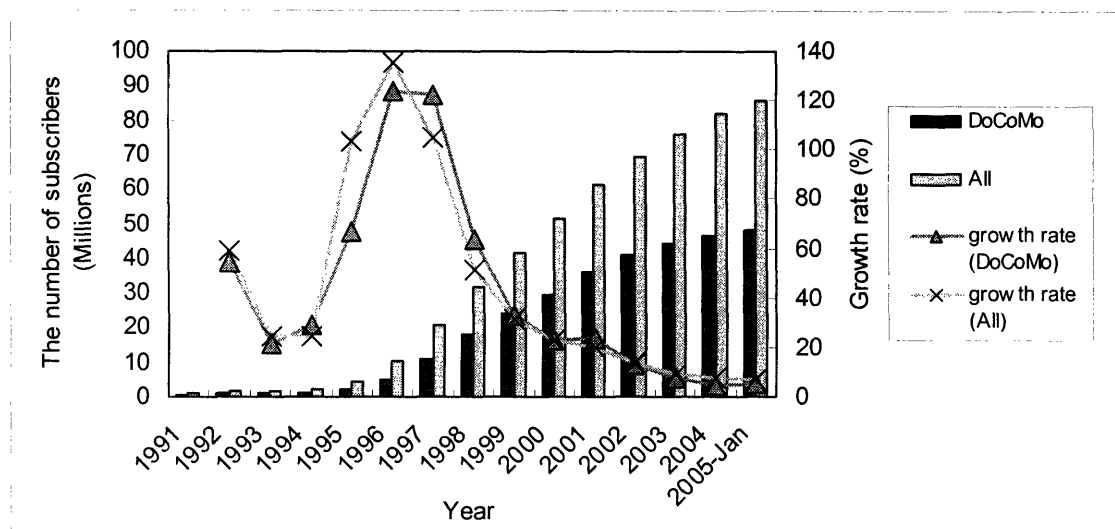
The objective of this thesis is to identify key factors that will produce further growth for NTT DoCoMo in Japan's mature mobile market.

Since the early 1990s, the mobile market in Japan has grown rapidly. Competition for getting market share resulted in technological innovations like NTT DoCoMo's i-mode service to mobile operators. Until recently, those innovations had leveraged the growth of the mobile industry. However, in 2004 the number of mobile phone subscribers exceeded 85 million and penetration rate reached 66.6%. Under such circumstances, the growth of mobile operators is gradually slowing. Recently, NTT DoCoMo announced that its sales and profit in 2004 would decrease compared to 2003—the first time this has happened since NTT DoCoMo was founded (Table 1-1, Fig.1-1).

Table 1-1 Financial data, FY 2003 to FY 2005, NTT DoCoMo

(in ¥, billion)	2003	2004	2005 (Forecast as of Oct. 29, 2004)
Operating Revenue	4,809.1	5,048.1 (+4.97%)	4,820 (-4.52%)
Operation Income	1,056.7	1,102.9 (+4.37%)	830 (-24.74%)
EBITDA	1,836.3	1,858.9 (+1.23%)	1,611 (-13.34%)

Source: NTT DoCoMo IR presentations, 2004



Source: Telecommunications Carriers Association, 2005

Fig. 1-1 Growth rate in number of subscribers in Japanese mobile market

Moreover, there are several threats that may change the structure of the market. The first threat is mobile number portability (MNP), a feature that enables subscribers to change their mobile carrier without giving up their current telephone number. According to reports from countries that have already introduced MNP, competition based on services and price has become much more intense.

Another threat is new entrants into the mobile market. Although there have been many M&As in the last decade, NTT DoCoMo's market share has remained stable. In 2004, the Ministry of Internal Affairs and Communications (MIC) announced that it was considering providing new band-width spectrum for newcomers, which will encourage newcomers to provide their services at much lower prices than incumbents in the market.

Globalization is another threat. Until now, Japanese mobile operators have provided their services only in Japan using standard Japanese technology and equipment that was developed with Japanese vendors specifically for providing their services. In contrast, foreign

mobile operators purchase equipment from international vendors such as Nokia and Ericsson. In 2001 third-generation (3G) mobile phone service was launched in Japan. Because it was standardized by the International Telecommunication Union (ITU) it enabled foreign equipment vendors to enter the Japanese mobile phone market—and vice versa. That will undoubtedly have some effect on the current value chain.

1.2 THESIS STRUCTURE

There will be seven chapters in this thesis, beginning with Chapter 1 which provides an introduction to help the reader understand the objective and structure of the thesis. Figure 1-2 provides a visual framework of the thesis structure.

In Chapter 2 I examine, in a general way, how companies grow. The research provides an overview of the literature on the topics of growth and innovation, including the necessity of growth, the processes of growth, the characteristics of a mature market, and difficulties of maintaining continuous growth. In Chapter 3, I offer some solutions for further growth. These are derived from cases about growing companies. I investigate processes, requirements, and risks for each solution. Three growth patterns are examined: a new market innovation that leverages the core business, platform leadership and concentrated investing in a prospective business.

In Chapters 4 and 5, I identify factors affecting the mobile market by applying the frameworks. In Chapter 4, I investigate trends in the world mobile market. These trends include technologies, penetration rate, handsets, and alliances. I also describe the process involved in introducing the third-generation (3G) mobile service.

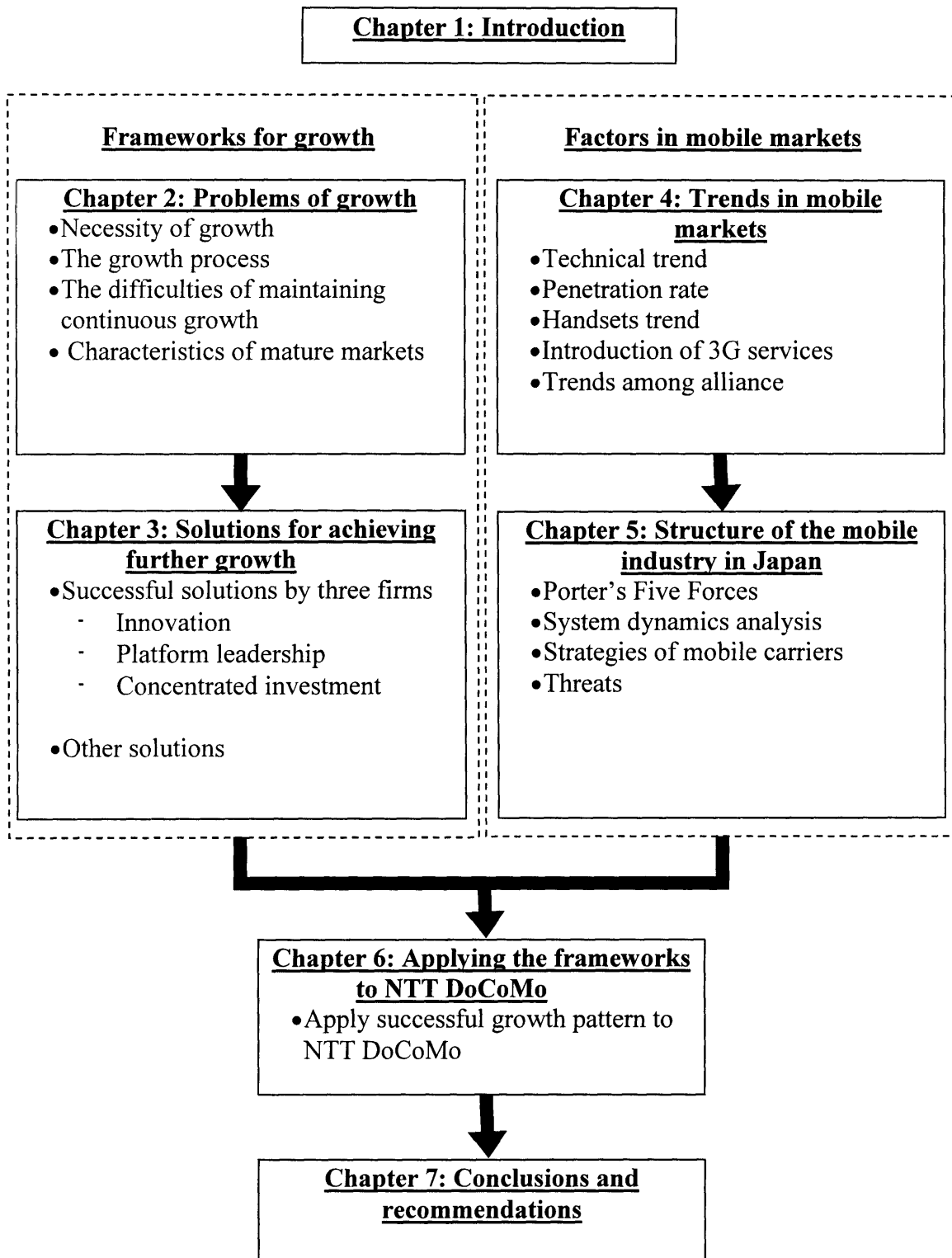


Figure 1-2. Structure of the thesis

In Chapter 5, I analyze the structure of the mobile industry in Japan, using Michael Porter's Five Forces Model to determine if the industry is currently profitable. I also use a system dynamic model to help understand the important factors in the industry. Finally, the strategies of mobile carriers in Japan and the threats to the mobile industry in Japan are shown as factors that will affect the frameworks.

In Chapter 6, I take the frameworks from Chapter 3, add the factors discussed in Chapters 4 and 5, and show how this model can be adapted to formulate NTT DoCoMo's future strategy.

In Chapter 7, I conclude the thesis and identify keys for growth in Japan's mature mobile market.

Chapter 2

The Problems of Growth

In this chapter I describe the necessity of growth for a company. I analyze patterns of growth and potential difficulties. From there I can define the characteristics of a mature market.

2.1 WHY IS CONTINUOUS GROWTH NECESSARY?

Although most people assume that growth is necessary for a company, I would like to define that necessity as a starting point. I find there are three perspectives from which growth can be viewed: shareholders, employees, and society.

2.1.1 Shareholders

For potential investors, the growth of a company is a signal to invest into the company. If further growth is not forthcoming or expected, investors will not want to invest in the company

For shareholders, a company's growth signals that the company is likely to be prospering and that they have made a good investment by purchasing shares in the company. Shareholders are likely to sell their stock if they perceive that the company is not progressing

satisfactorily, or that it has become stagnant, or that growth has stopped. As a result, the price of a company's stock goes up and down reflecting those perceptions.

The problem is that growth rate forecasts by analysts affect shareholders' reactions. When the growth rate does not exceed the value that analysts have forecasted, stockholder reaction tends to be negative. Even if the growth rate maintains the previous year's rate, there may be skepticism about growth potential.

2.1.2 Employees

Growth rate affects employees' motivation. If growth rate is flat or negative, employees tend to become conservative and try to maintain their current positions. Often this results in an organization becoming bureaucratic unless management recognizes the trend and makes improvements.

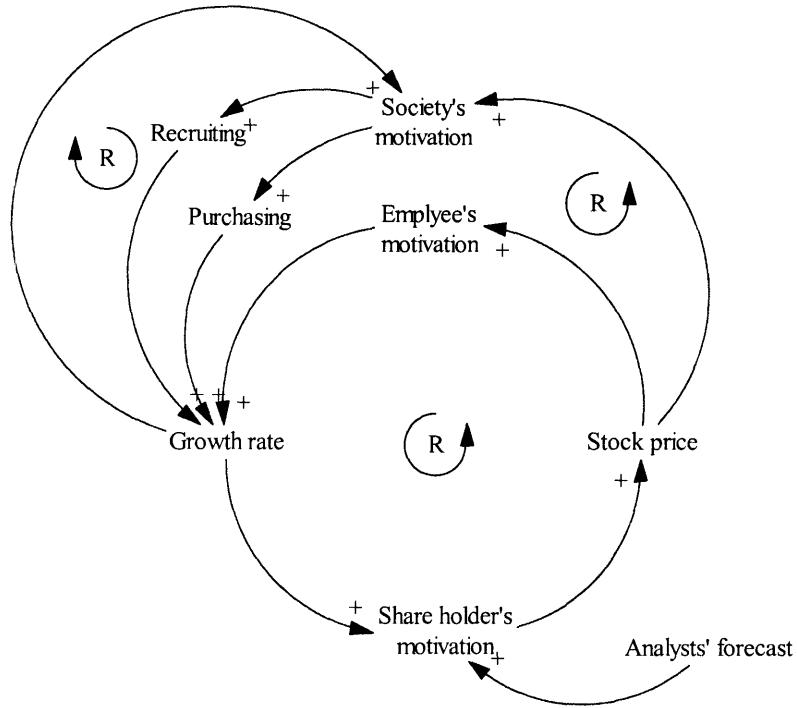
On the other hand, a positive growth rate tends to encourage good employees to remain with the company.

These reasons create a positive feedback loop.

2.1.3 Society

From society's point of view, a positive growth rate in large companies is a sign that business is improving, which in turns generally motivates consumers to purchase more goods. An increased purchase rate imparts a positive image to society and makes it easier to recruit talented employees. This also creates a positive feedback loop.

A system dynamics model, which includes the factors mentioned so far, is shown in Figure 2-1.



Source: Author, 2005

Fig. 2-1 Relationship between growth rate and stock price

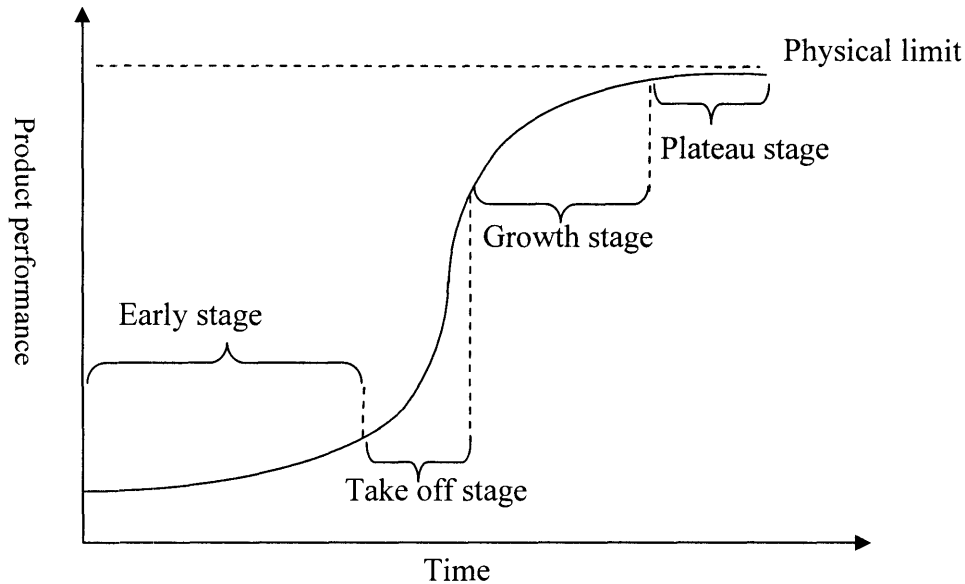
2.2 THE PROCESS OF GROWTH

In this section, I will explain how a company grows by using S-curve and innovation patterns.

2.2.1 S-curve

Generally speaking, an S-curve is used to explain the life cycle of a product's performance.

As shown in Figure 2-2, an S-curve includes four stages: Early, Take off, Growth, and Plateau.



Source: Foster, 1999

Fig. 2-2 S-curve

In the *Early stage*, product performance is poor with many failures, but the product has unique characteristics that capture innovative users.

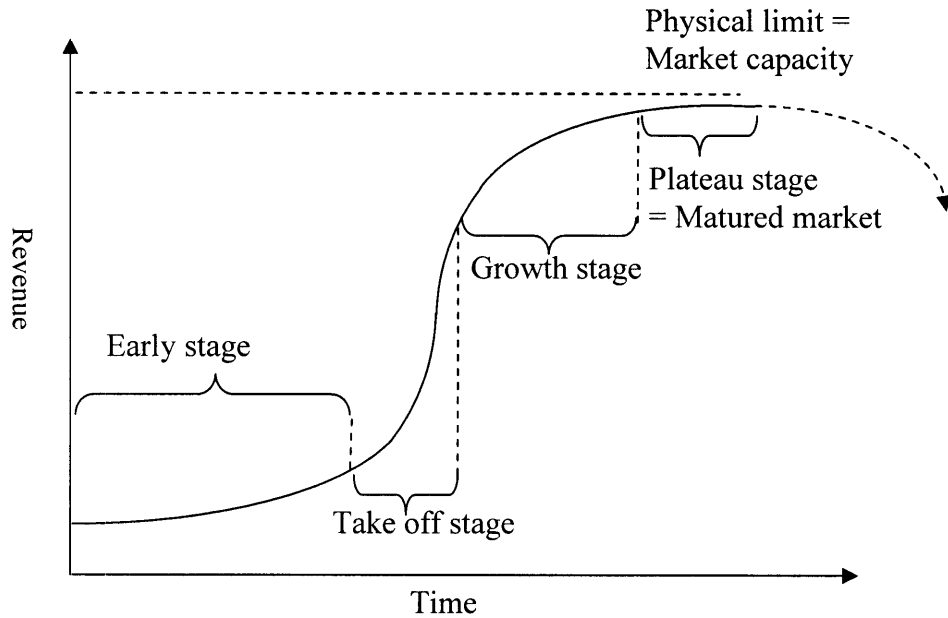
In the *Take-off stage*, feedback from users and competition between companies tends to strengthen the product's performance.

In the *Growth stage*, large companies that successfully exploit economies of scale and mass production will dominate the industry.

However, in the *Plateau stage*, the growth curve of product performance becomes flat because growth has reached a physical limit or saturation point.

An S-curve like the one above shows not only the life cycle of a product but also the growth of a company (see Fig. 2-3). In the plateau stage the company has to compete with

followers either by price or economies of scale. If the company remains in that situation, it will move into the decline stage. Therefore every company must avoid staying for any length of time in the plateau stage.



Source: Author, 2005

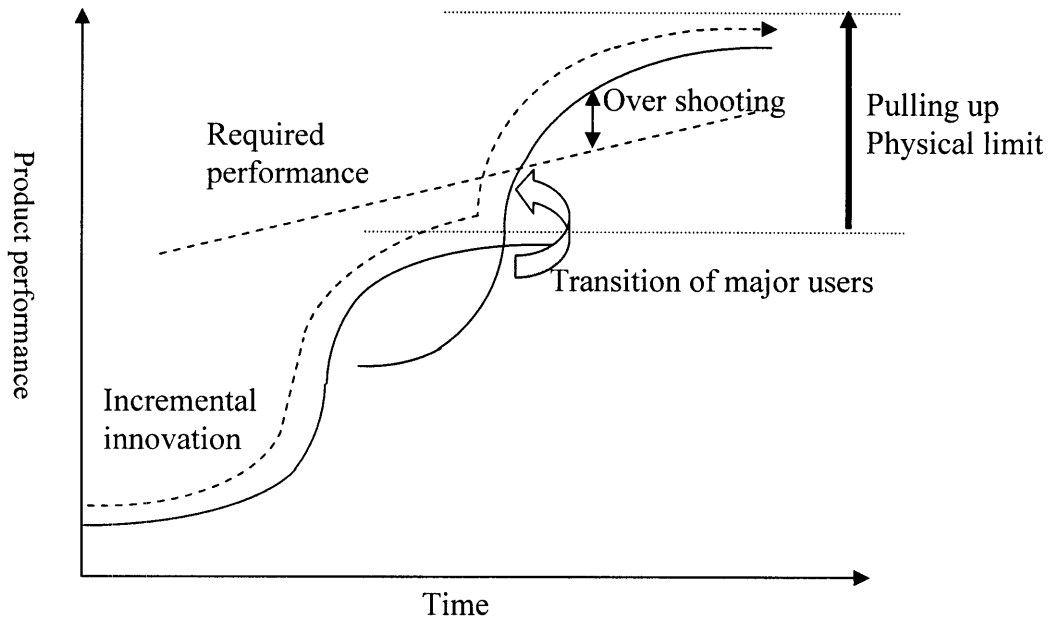
Fig. 2-3 S curve for company's growth

2.2.2 Incremental Innovation and Disruptive Innovation

To avoid entering the plateau stage, a company typically makes every effort to develop innovations. Innovation can be classified into two types: incremental innovation and disruptive innovation.

Incremental innovation occurs in an S-curve in the form of development or improvement of a product or service in the early stage. Products or services on the same S-curve are based on the same architecture. Improvement of a product's performance by incremental innovation slows down at the plateau stage because of the product's physical

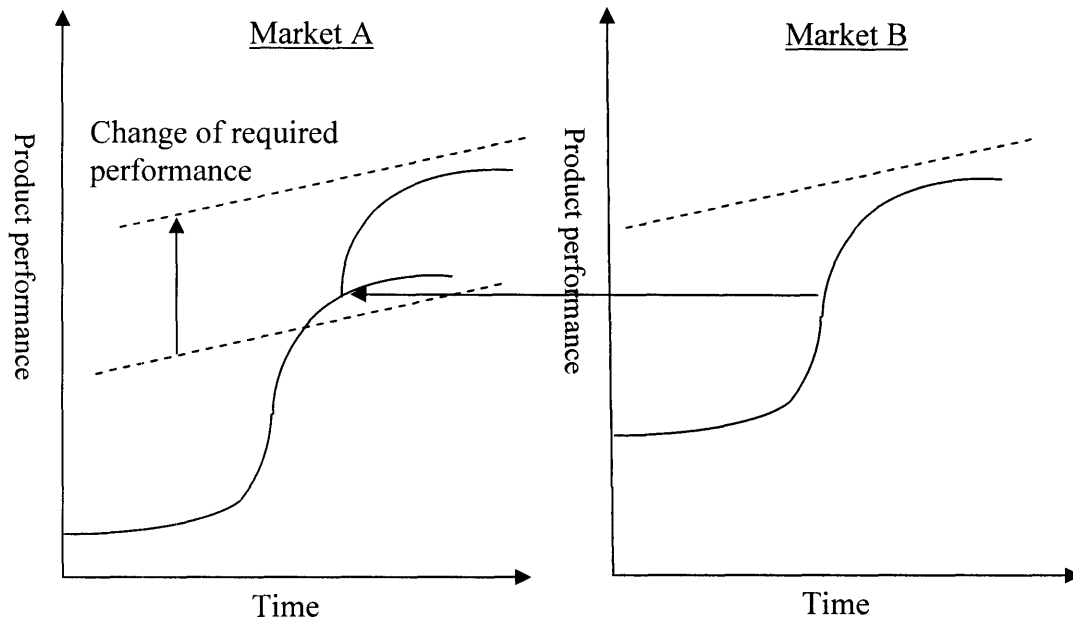
limitations. Companies that lead markets have to prepare for the plateau stage by replacing current technology with new technology for the markets. However, continuous incremental innovation causes performance to overshoot customer demand. When this occurs, customers are not willing to pay for the performance.



Source: Christensen, 1997, modified by author

Fig. 2-4 Incremental innovation

In contrast, *disruptive innovation* occurs between the current S-curve and a new S-curve in another market. The new S-curve is based on a different concept than the old S-curve (see Fig. 2-5). Generally speaking, the new concept aims to provide cheaper, more useful products or services to improve on or replace old products or services that are currently in the plateau stage. Market share will swing dramatically when the performance of the new product or service positively or negatively impacts the old one. At that time required performance also is changed by the disruptive innovation.



Source: Christensen, 1997, modified by author

Fig. 2-5 Disruptive innovation

2.3 WHY IS CONTINUOUS GROWTH SO DIFFICULT?

In this section I discuss challenges that make continuous growth difficult to maintain.

2.3.1 Exponential Growth Needed

This challenge is a simple math problem. If a company is focused on showing an upward growth rate rather than highlighting stable value, the company will have to continually grow its business exponentially.

The formula to calculate the growth rate of revenue in year t is shown as follows:

$$G_t = (R_t - R_{(t-1)}) / R_{(t-1)}$$

where:

G_t : Growth rate in year t,

R_t : Revenue in year t

Therefore, Revenue in year t can be calculated by using the following formula:

$$R_t = G_t * R_{(t-1)} + R_{(t-1)}$$

The formula can be changed by using revenue in t-2 year:

$$R_t = G_t * (G_{(t-1)} * R_{(t-2)} + R_{(t-2)}) + G_{(t-1)} * R_{(t-2)} + R_{(t-2)}$$

Assuming growth is stable, the formula can be changed:

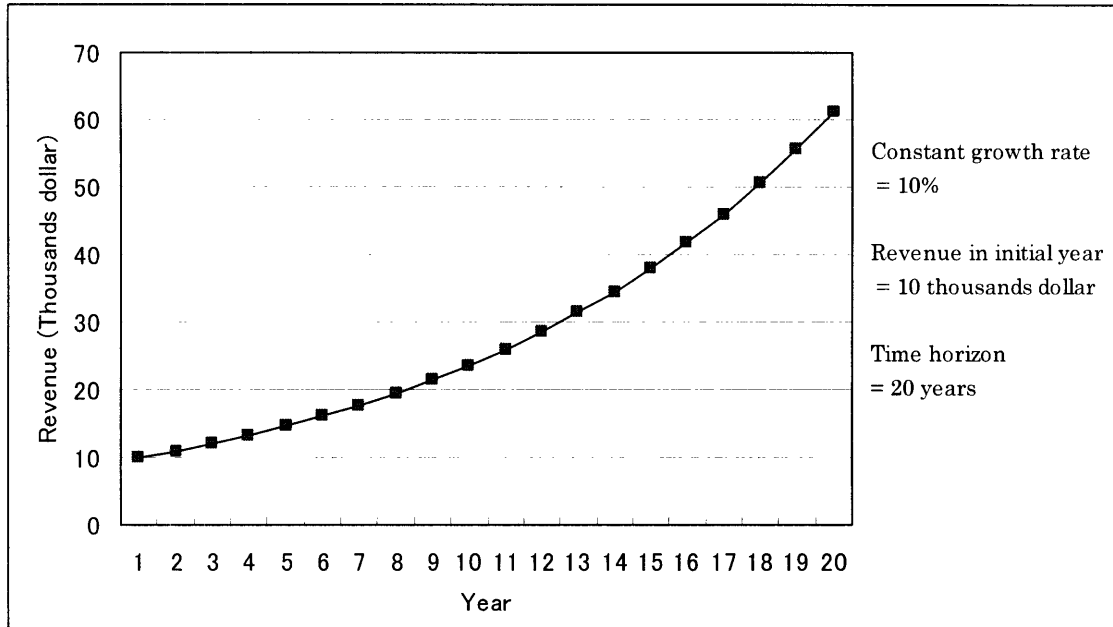
$$R_t = G^2 * R_{(t-2)} + 2G * R_{(t-2)} + R_{(t-2)}$$

Finally, by using revenue in t-x year, the formula can be represented as follows:

$$R_t = G^x * R_{(t-x)} + x \sum_{i=1}^{x-1} (G^{(x-i)} * R_{(t-x)}) + R_{(t-x)}$$

As this formula shows, the revenue a company must earn grows exponentially from year to year under a constant growth rate. I have illustrated this revenue growth under constant growth rate in Figure 2-6.

As an example, NTT DoCoMo must earn more than ¥250 billion as operating revenue in 2005 in order to maintain the same growth rate as in the previous year. That number is almost equal to the operating revenue of Tu-Ka Cellular in 2005, the fourth largest mobile carrier in Japan.



Source: Author, 2005

Fig. 2-6 Revenue under a constant growth rate

2.3.2 How do Large Companies Perform to Achieve Further Growth?

Typical behaviors of large companies that lead their markets are described by Christensen (1997) as a series of steps.

Step 1: A disruptive product is created as a prototype in the established company.

Step 2: Management decided there is declining demand for the current product based on market research with current users.

Step 3: The established company concentrates on developing an incremental innovative product that will create a larger profit margin with current users.

Step 4: A new company is founded by engineers who worked for the established company; they identify a new market for the product in a niche or low-end category.

Step 5: The new company expands its target to the upper-end category where the established company is already selling its current product.

Step 6: The established company changes its strategy and develops products based on the new architecture.

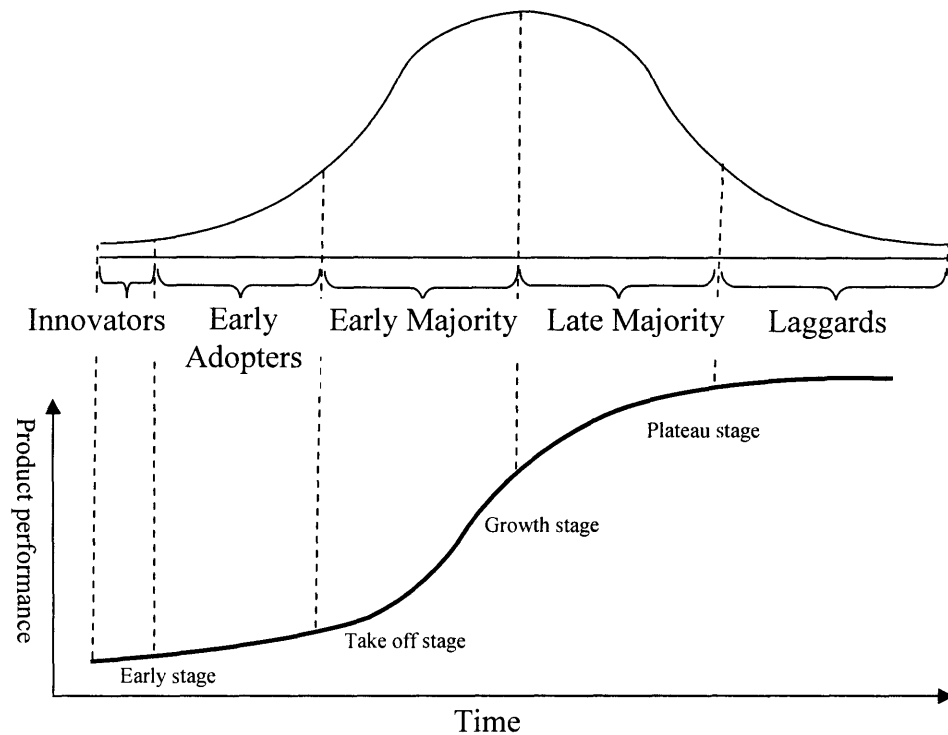
The reasons for this behavior is explained by the concept of “value network.” The value network has a structure of nested boxes that consist of manufacturers and markets. The companies in the value network have characteristics that are adequate for the value network, and they tend to make much of customers in the value network. Therefore established companies tend to fail to follow disruptive innovation although they carefully manage their organization so as to move it toward further growth.

2.4 CHARACTERISTICS OF A MATURE MARKET

In this section I define the characteristics of a mature market.

2.4.1 The Target is “Late Majority and Laggard” Consumers

Moore (1999) divided consumers into five categories: Innovators, Early Adapters, Early Majority, Late Majority, and Laggards. These consumers show up in the market according to their perception of the product’s performance, as shown by the S-curve in Figure 2-7.



Source: Moore, 2002

Fig. 2-7 Technology adoption life cycle and S curve

Innovators are consumers who are keenly interested in new technology. They buy a new product as soon as it appears for sale in a market. Although **early adopters** are not as enthusiastic about technology as are innovators, early adopters are familiar with new technologies and typically find it easy to understand the benefits of a new product. If they identify benefits they like, they will buy the new product very early in its life cycle. The **early majority** and the **late majority** comprise the majority of a market. These two categories of consumers are more practical than early adopters. Moreover, the late majority tend to wait and observe a product's performance until it becomes generally accepted as a standard in the market. **Laggards** are consumers who just do not like new technology or the new product that

incorporates a new technology. It is very difficult to convince them to purchase the new product.

In a mature market, the main target is the late majority and laggard consumers. Enormous amounts of money are spent on market research to determine how to persuade the late majority and laggards to purchase a new product. Thus the market is fully segmented by preference.

2.4.2 Products Become Commodities

Utterback (1994) defined “dominant design” as a product design that has been approved during its growth stage by the majority of the consuming public. After a dominant design is established in the market, other companies begin to imitate it. Thus competition between companies shifts from differentiation of product to cost and scale. In the plateau stage, products have similar functions and it is hard to determine which is most adequate for users.

2.4.3 Price Wars

In a mature market, it is difficult to make companies to make a profit because the products become commoditized, which frequently results in a price wars to move the product in the market.

After the growth stage, companies begin to pursue economies of scale as a way to decrease production costs. As a result, production capability increases beyond the capacity of the market. Price discounting is a typical strategy adopted by companies in order to compete with other companies. However, that price discounting gives customers greatly increased

purchasing power; they tend to buy until items go on sale before purchasing. Moreover, many companies find they must now discount the price in response to their competitor's price. That creates a negative feedback loop that exhausts both companies. The so-called "winner" of a price war usually ends up losing both growth and profit.

2.5 SUMMARY

Continuous growth is necessary for firms because it causes positive feedback, not only for stakeholders—both shareholders and employees—but also for society. However, it is difficult for a company to continue growing beyond its S-curve.

Challenges arise in the form of the company's size, its desire to retain current customers, and to fend off invasion by newcomers to the market.

In a mature market, products become commoditized, which companies to pursue economies of scale. As a result, surplus products are produced which exceed the capacity of the market, which in turn gives consumers power and causes price war between companies. Eventually it becomes difficult for the company to grow and it is unable to move out of the plateau stage.

Chapter 3

Solutions for Achieving Further Growth

In this chapter, I present solutions for achieving additional growth that have worked well in the real world. I have identified three solutions by which companies have succeeded in growing in a mature market:

- 1) A new market innovation that leverages the core business
- 2) Platform leadership
- 3) Concentrated investing in a prospective business

For each solution, I give a brief description along with a concept model in which I use circles to represent the size and kind of markets, and an S-curve to represent the degree of maturity of the markets. Then I analyze the requirements needed to apply the solution.

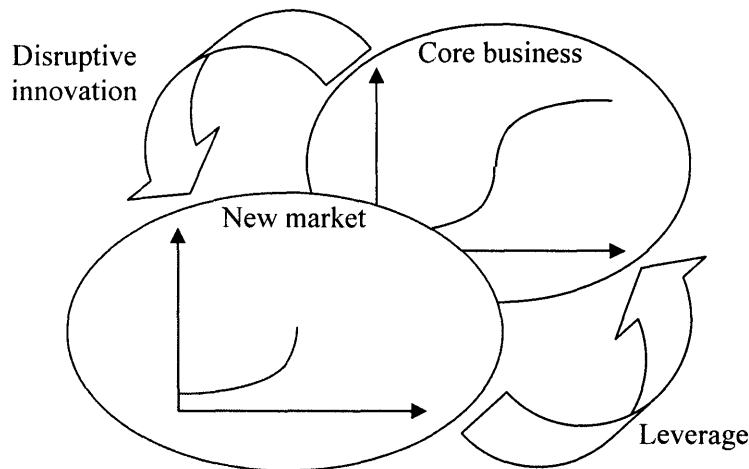
3.1 A NEW MARKET INNOVATION THAT LEVERAGES THE CORE BUSINESS

“Innovation” is an attractive word for companies in a mature market. Ideally, the new market created by a disruptive innovation will leverage the company’s mature core business, as shown in Figure 3-1.

Apple is an excellent example. Although Apple was losing in its competition with Wintel, Apple created an innovative on-line music distribution market. There was already an

on-line music store, but then Apple developed its highly popular iPod. The product's design and the reasonable prices for music attracted millions of consumers. Apple established its iPod brand and produced variations for each segment of the market.

Apple is a company that believes that ongoing investment in research and development is critical to producing innovative new and improved products and technologies. In addition to updates to its existing line of personal computers and related software, services, and peripherals, the company continues to capitalize on the convergence of digital consumer electronics and the computer by creating product innovations like iPod and the iTunes Music Store.

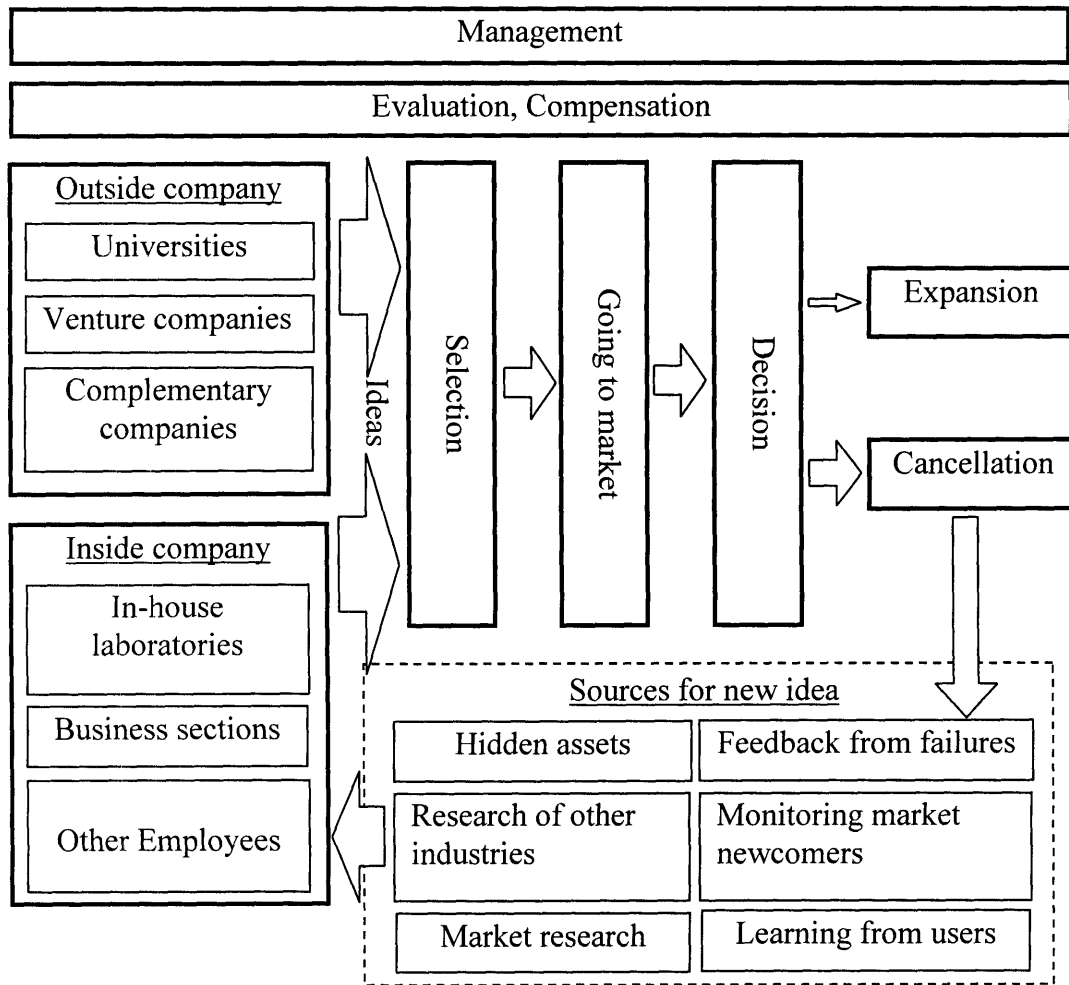


Source: Author, 2005

Fig. 3-1 New market leverages core business

However, as mentioned in Chapter 2, a disruptive innovation may be created by small or startup companies rather than established companies because the established company wishes to protect its current level of profit. It is not easy to do that systematically. For example, although the R&D division of Pfizer develops thousands of ideas for new medicines, only one idea typically gets through the funnel (Wheelright and Clark, 1992) and

into commercialization. That commercialization process takes about fifteen years on average and requires a huge supporting R&D budget. On the other hand, some established companies like 3M, Pfizer, and DuPont, are taking steps to create innovations systematically. By referring to those companies' structures, I have illustrated the structure of an innovative company in Figure 3-2.



Source: Author, 2005

Fig. 3-2 Structure of an innovative organization

The factors in Figure 3-2 are explained below.

➤ **Sources for new ideas**

I have identified six factors that could be considered sources for new ideas: hidden assets, feedback from failures, research by other industries, monitoring market newcomers, market research, and learning from users.

Slywotzky and Wise (2003) noted that *hidden assets* are an important factor for helping established companies create a new market. Hidden assets are different from intangible assets and generally include brand, intellectual properties, number of customers, loyal user communities, partnerships, and relationship with customers. These assets have been established for a long time, and they are difficult for newcomers to imitate. On the other hand, established companies have built hidden liabilities that need to be understood including its corporate culture, organization, brand image, and relationships with suppliers or customers.

Feedback from failure is an important source of innovation. An established company in particular often has a number of failed projects in its history. If someone fails with an innovative project, management should not punish that person. Reserving the experience for possible background or foundation of a new innovation in the future is important, so management must take the time to analyze why a certain innovation failed.

Research conducted by other industries helps innovators determine if their own technology or process might work in the industry. Sometimes that causes companies to expand their business area or to enter into a partnership with other companies.

Incumbents have to defend their market against newcomers that have a disruptive innovation. Therefore *monitoring of market newcomers* has to be done regularly so established companies can protect their market.

Although *market research* is a traditional method for determining user needs, von Hippel (1998) suggests that *learning from lead users* who know what they really need is actually another method of developing an innovation. This is especially obvious in the software industry. Finding lead users and associating with user communities are key factors.

➤ **Inside Company**

By taking advantage of the sources mentioned above, I have identified three sectors within a company that could devise ideas for new innovations:

1. In-house laboratories, in which a company invests to create innovative technologies.
2. A business section that is eager to increase its profit via a new business.
3. Other employees in the company who have identified what they really need as users or are close to their customers.

➤ **Outside Company**

Most companies use internal resources to create innovation. However, there is a limit to how much the company can rely on those resources. To increase the possibility of developing a successful innovation, a company should consider using outside resources.

The most common outside resources is universities and academia in general, which already have many established laboratories that are developing innovations. Venture companies often have innovative technologies and emerging markets, which may be potential external resources. Another resource is established companies that are role-playing as complementor for a current business, and may be able to suggest new ideas and

collaborations. The company needs to maintain contact with the outside companies so as not to miss valuable ideas.

The real challenge lies in how to obtain those resources. The company can choose among alliances, joint ventures, M&As, or investment. Each option has advantages and disadvantages, and the company will have to choose which path work best according to the company's strategies for the future.

➤ **Selection**

Selecting ideas is hard work. A good idea should be chosen based not only market size (calculated by market research) but also on intuition which can be uncertain. If the idea is totally new and there no market has been established, it is difficult to predict the exact market size. However risk-taking is often necessary in order not to lose a profitable innovation.

➤ **Going to Market**

Once an idea is chosen for commercialization, a project team must be organized. The number of members on the team should be small, and excellent people chosen from throughout the company. Help from departments in the core business is a prerequisite in order to successfully launch a new business. If the project team is under the direct control of the CEO, it can reduce potential obstacles from inside the company. Moreover, strict budget management and improvements added via try-and-error are important.

➤ **Decision**

In some circumstances a project should be evaluated, and management will have to decide whether or not to continue a project. The factors that measure the performance of the project include: current financial status, possibilities, and difficulty to grow.

One example is Cusumano's eight points for a successful startup, that results in Strategy, Technology, Product and Potential for large investor payoff. These include:

- Strong management team,
- Attractive market,
- "Compelling" new product or service,
- Strong evidence of customer interest,
- Plan to overcome the "credibility gap",
- Business model – early profits,
- Scalability, and
- Flexibility.

Once the plan is approved by management, the project team can be expanded into a prospective business. But just as often, plans are cancelled at this stage. Even so feedback from those plans is important as a resource for possible new ideas in the future.

➤ **Evaluation and compensation**

For promote and induce innovations from people inside the company, evaluation and compensation system are very important. For example, 3M has its so-called "15%" rule in which employees can dedicate up to 15% of their work time to innovative activities. In addition, the company has put in place a unique compensation system to further motivate employee to develop innovative ideas.

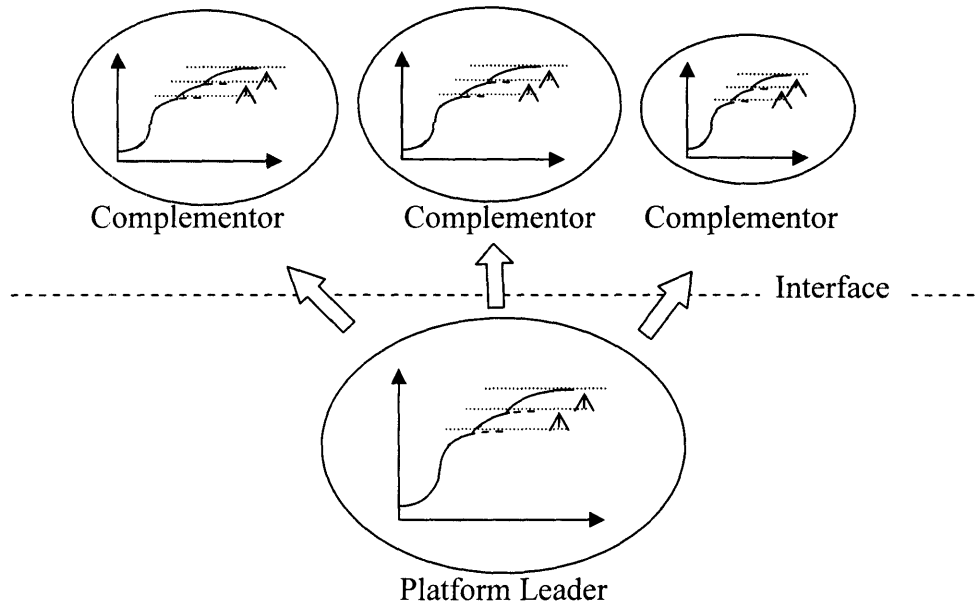
➤ **Management**

In an innovative company, management needs to be in control of the entire system so they are aware of how well the system is performing. This is especially important in the case of major investment in a new business and/or protecting a new business. On the other hand, management has to preserve a balance between the current core business and any new business.

3.2 PLATFORM LEADERSHIP

The concept of platform leadership (see Figure 3-3) was devised by Gawer and Cusumano (2002). A company that establishes a crucial interface between its complementors can grow continuously by controlling the growth of the whole industry. The interface can be both open and closed, depending on the company's strategy. Another important strategy is retaining control of the company's core competence so it is not imitated by competitors. For example, Intel developed microprocessors for personal computers and realizes profit by maintaining its platform leadership position in the personal computer industry. By itself, a microprocessor can do nothing for customers. Generally a personal computer consists of various hardware and software components, including a monitor, keyboard, storage devices, memory chip, operating system, applications for business or home and so on and Intel does not develop these products itself. Therefore even if Intel develops another innovative new microprocessor with added new functions, such as for example PCI, AGP and USB, it is not clear that other manufacturers will develop new products for the new functions. If there are no products for the new functions, the performance of personal computers is limited to the older products. Therefore, Intel collaborates with its complementors, such as Microsoft and

parts manufacturers, to create innovation that will have an impact on the entire industry, reflecting the innovation of its microprocessors as a platform leader.



Source: Author, 2005

Fig. 3-3 Platform leadership

The concept includes four levers that allow platform leaders to design and test the validity of their strategies:

1) Scope of the firm

This lever deals with the company internal actions as well as what it encourages others to do externally. Developing its own complementary relationships helps to ensure the success of the company's current and future platforms.

2) Product Technology (architecture, interfaces and intellectual property).

This lever deals with decisions regarding the degree of modularity of architectures and the degree of openness of the interfaces. “Open but not open” technology protects the platform leader.

3) Relationships with external complementors

This lever determines the nature of relationships between the platform leader and its complementors, that is, how collaborative versus how competitive the relationship will be. If the platform leader decides to enter complementary markets directly, the leader must take care about how to achieve consensus with its partners.

4) Internal organization

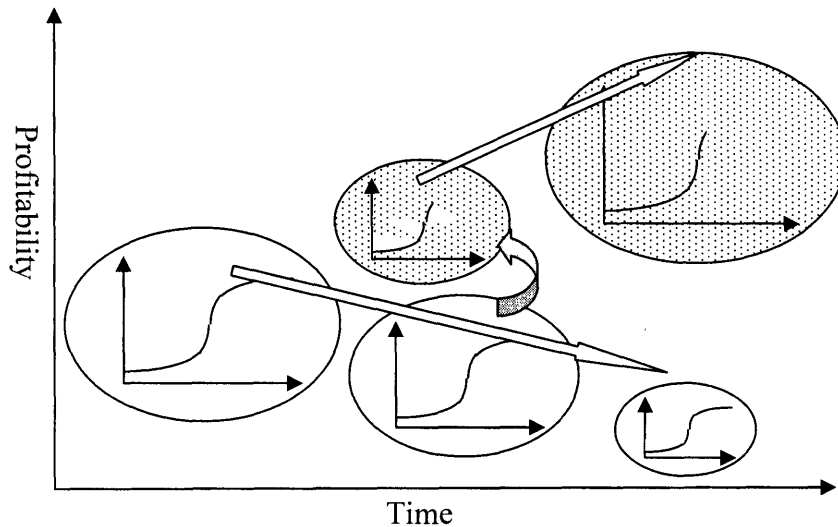
This lever allows platform leaders to use their internal organization structure to manage external and internal conflicts of interest more effectively. Options include keeping groups with similar goals under one executive or separating groups into distinct departments in order to address potentially conflicting goals with outside constituencies.

NTT DoCoMo and its i-mode technology is also a platform leader in the telecom industry. I will discuss NTT DoCoMo’s current strategies for its i-mode platform in Chapter 6.

3.3 CONCENTRATED INVESTING IN A PROSPECTIVE BUSINESS

Concentrated investing into a prospective business is the most straightforward strategy for companies because they can exploit assets already in hand which allows their products to boost incremental innovations that may be in the takeoff stage (see Figure 3-4).

However, such action requires a brave decision for the CEO to reduce or withdraw from the other businesses even if those are their core businesses.



Source: Author, 2005

Fig. 3-4 Shift of core business

In 1988, Sharp, the world’s largest LCD TV manufacturer (Display Search, 2005) declared it would concentrate on the development of LCD television. At the time it was not clear whether LCD TV will bring further growth to the company not. However, Katsuhiko Machida, CEO of Sharp, decided to take the step based on the company’s policy: “Only one rather than number one.” As a result, Sharp gained a huge advantage over its competitors.

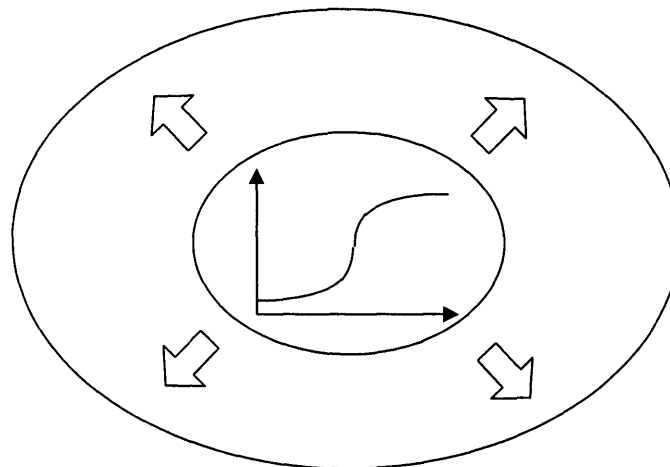
In contrast, SONY had trouble with its core electronics business and was unable to shift from PCs to flat TV. This caused the company’s profits to decline dramatically, resulting in the so-called “SONY shock” when Sony shares plunged to a seven-year low.

3.4 OTHER SOLUTIONS

In addition to the three solutions described above, I found examples of other strategies taken by established companies. Although I have not analyzed those strategies in this thesis, I will describe them briefly. In addition, I have not described the cost reductions that have been achieved by improvement of production or logistics processes and raised prices in this thesis.

3.4.1 Geographic expansion

Geographic expansion is a strategy which not only results in an expansion of the firm's market but also an improvement of its supply chains. Numerous multinational corporations (MNCs) have been established since the 1970s. The strategy of many of those companies has been to shift from exporting to manufacturing abroad. Toyota and GE are typical examples of MNCs. Each is eager to expand their markets and reduce production costs.



Source: Author, 2005

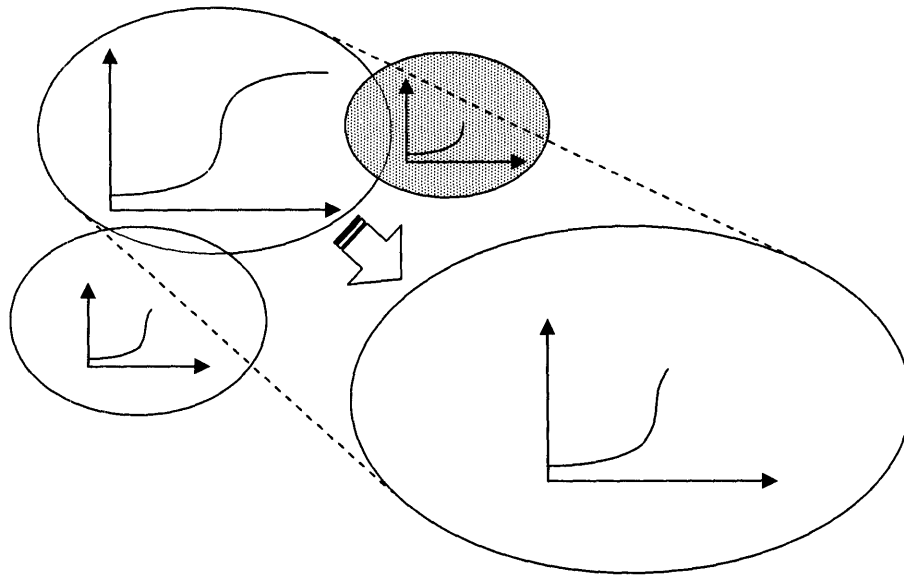
Fig. 3-5 Geographical expansion

3.4.2 Mergers and Acquisitions

Since the late 1990s mergers and acquisitions (M&A) have been a frequently used strategy for survival in a mature market (see Figure 3-6). There are usually three main reasons why a company enters into an M&A:

1. to enter a new line of business with low risk;
2. to expand the company's core business; or
3. to complement the company's existing business.

Johnson & Johnson has completed more than ten M&As in order to expand and diversify its business. As a result, its sales have increased every year for 72 consecutive years, and the company has enjoyed double-digit earnings increases for twenty consecutive years.

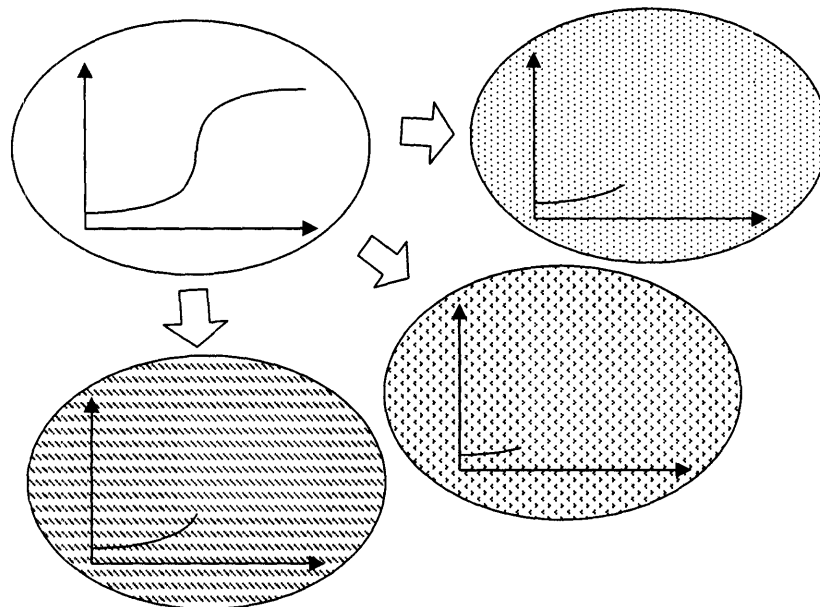


Source: Author, 2005

Fig. 3-6 M&A

3.4.3 Brand Extension

If a company has a famous brand, extending that brand is an attractive strategy (see Figure 3-7). A company that has grown rapidly in an emerging market will try to successfully duplicate that business model into other kinds of market. That invasion into a mature market usually produces a disturbance among the incumbents. As a result, companies try to establish their brand in an entire market. Virgin began in the 1970s with a student magazine and small mail order record company. For example, Virgin Group is involved in airplanes, trains, finance, soft drinks, music, mobile phones, vacation travel, cars, wines, publishing, and bridal wear. The company has created over 200 companies worldwide, employing over 25,000 people.



Source: Author, 2005

Fig. 3-7 Brand extension

3.5 SUMMARY

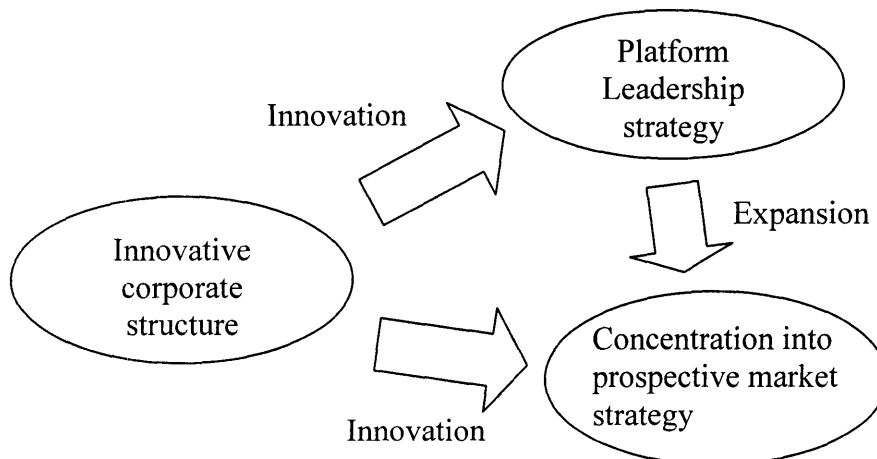
In this chapter I described three growth patterns that are apparent in mature markets. Those are innovation of a new market that leverages the company's core business, platform leadership, and concentrated investing into a prospective business.

For innovations in a new market that leverage the core business, the structure of the company is important. In addition, compensation systems and management itself play key roles in the structure.

Regarding platform leadership, developing and maintaining a balance between open and closed relationships, and management of conflict with complementors are important factors.

Concentrated investing needs foresight and the ability to make a courageous decision, but it also includes the risk of losing current market position.

Although these solutions can work at individual firms, innovative corporate structure should be the starting point as shown in Figure 3-8. From that point, platform leadership or concentrated investing are chosen as growth strategies.



Source: Author, 2005

Fig. 3-8 Relationship between three solutions

Chapter 4

Trends in the Mobile Communications Market

In this chapter, I provide background for the current mobile market by showing trends in the mobile industry during the 1990s and into the twenty-first century.

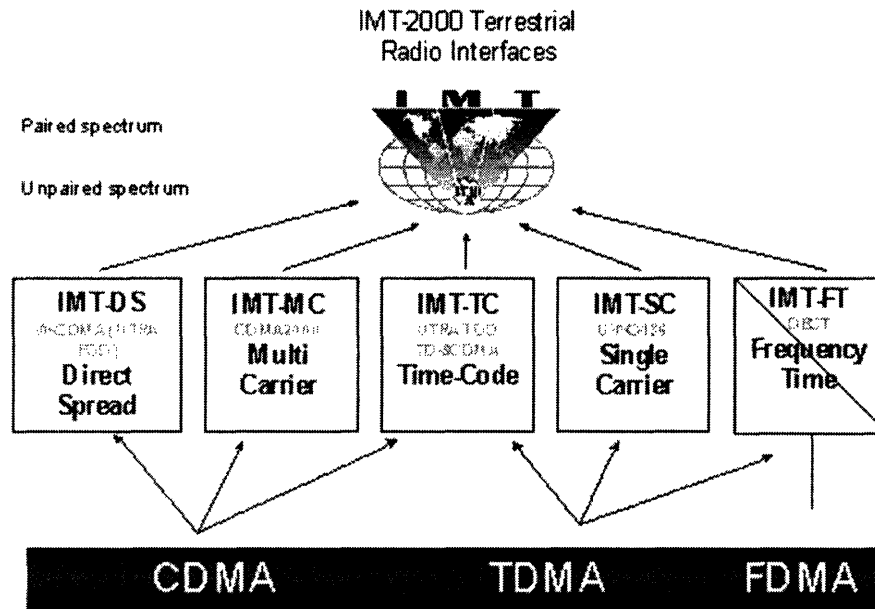
4.1 TECHNICAL TRENDS

In 2004, the world's mobile operators began to shift their services from second-generation mobile phone service (2G) to third-generation (3G) service around the world. The 3G mobile phone service enables customers to use new services like high-speed mobile Internet service and video phone calling.

In 2000, the International Telecommunication Union (ITU) recommended the IMT-2000 standard for 3G mobile phone services. That includes high-quality voice transmission, high-speed data transmission. Under the IMT-2000 standard, some technical standard groups were created. The Third Generation Partnership Project (3GPP) made the W-CDMA technical standard based on GSM technology which is used in Europe and Asia. On the other hand, 3GPP2 led by Qualcomm, has established another standard named CDMA2000 based on CDMA technology.

These two new standards have already been used for 3G mobile phone service in the world. The other three technical standards are TD-SCDMA supported by China, UWC-136

based on U.S. TDMA technology, and DECT based on a standard for cordless telephony in Europe.



Source: ITU, 2005

Fig. 4-1 IMT-2000 radio access standards

After standardization of 3G, each technical standard group expanded their standards for higher-speed data transmission. CDMA2000 is changing from CDMA2000 1X (up to 144Kbit/sec) to CDMA EV-DO (up to 2.4Mbit/sec). W-CDMA standardized HSDPA (High Speed Downlink Packet Access) (up to 14Mbit/sec).

Moreover, 4G, which runs at more than 100Mbit/sec data transmission speed and uses the spectrum more efficiently, is discussed in ITU. The concept of 4G, which is sometimes called “systems beyond IMT-2000,” generally includes the following factors:

- The system is expected to commercialize around 2010 and broadly penetrate around 2015.

- The system realizes transmission speed up to 100Mbit/sec for mobile usage, up to 1Gbit/sec for half fixed usage.
- The system complements multiple kinds of radio access standards seamlessly.
- The system has an “all IP” network that can handle networks more effectively.

Although at this time, it is not certain what services the 4G system will provide for customers, NTT DoCoMo is leading research into 4G technologies including radio access technologies, core network technologies, and human machine interface for 4G handsets.

4.2 PENETRATION RATE

Since the late 1990s, the mobile industry has grown rapidly. In China, the number of subscribers was 269 million in 2003 and grew to 335 million in 2004. The second-largest market is the U.S., followed by Japan (see Table 4-1).

Table 4-1 Top 10 countries by number of mobile phone subscribers

Rank	Country	Subscribers (1000s)	Penetration rate (%)	Population (1000s)
1	China	269,000	21.4	1,257,009
2	United States	158,722	54.3	292,306
3	Japan	86,659	67.96	127,514
4	Germany	64,800	78.54	82,506
5	Italy	55,918	101.76	54,951
6	United Kingdom	49,677	84.07	59,090
7	Brazil	46,373	26.36	175,923
8	France	41,683	69.59	59,898
9	Spain	37,507	91.61	40,942
10	Korea	33,592	69.37	48,424

Source: ITU, 2004

Thus countries with a low penetration rate and large population are excellent prospective markets for the mobile phone industry, although other factors—the gap between rich and poor, topography, economic growth, and culture—must also be considered.

However, as Table 4-2 shows, China, the U.S., and Japan rank low in penetration rate because of their large populations. In fact, some countries' penetration rate for mobile phones exceeds 100%. Others, such as Taiwan, have grown at extraordinarily high rate in the past five years. Therefore, Japan appears to have room for further growth compared to other high penetration countries. It must be noted, too, that the extremely high penetration rates come mainly from an increase in the number of prepaid subscribers. Prepaid service has no monthly charge and additional charges are paid by prepaid card. Although the cost per minute is relatively high, customers are attracted to this form of mobile phone use because it is easy to buy and it uses simple, uncomplicated rate plans. Therefore customers in those countries have multiple mobile phones or SIM cards and use them in a variety of ways.

However, prepaid service is a double-edged sword for mobile operators because the service does not produce much money from subscribers and the relative anonymity of such service makes it easier to use in criminal activities. Most mobile operators are taking steps to decrease the percentage of prepaid service use among their subscribers.

Table 4-2 Mobile phone penetration rate by country

Rank	Country	1998 (1000s)	2003 (1000s)	CAGR* 1998- 03	Penetration rate 2003 (%)	Prepaid (%)	Population (1000s)
1	Taiwan	4,727	25,090	39.6	110.84	20-30	22,636
2	Luxembourg	131	473	38	106.05	63	446
3	Hong Kong	3,174	7,241	17.9	105.75		6,848
4	Italy	20,489	55,918	22.2	101.76	91	54,951
5	Iceland	104	279	21.8	96.56		289
6	Czech Republic	965	9,709	58.7	96.46	75	10,065
7	Israel	2,147	6,334	31.1	95.45		6,636
8	Spain	6,437	37,507	42.3	91.61	57	40,942
9	Norway	2,106	4,163	14.6	90.89		4,581
10	Portugal	3,075	9,341	24.9	90.38	78	10,336
11	Finland	2,846	4,700	10.6	90.06	4	5,219
12	Sweden	4,109	7,949	17.9	88.89	68	8,943
13	Denmark	1,931	4,785	19.9	88.72	21	5,394
14	Austria	2,293	7,095	25.3	87.88	48	8,073
15	Slovenia	162	1,739	60.8	87.09	52	1,997
18	UK	14,878	49,677	35.2	84.07		59,090
22	Germany	13,913	64,800	36	78.54	53	82,506
28	France	11,210	41,683	30	69.59	40	59,898
29	Korea(Rep.)	14,019	33,592	19.1	69.37		48,424
32	Japan	47,308	86,659	12.9	67.96	3	127,514
42	United States	69,209	158,722	18.1	54.3	6	292,306
69	Brazil	7368.2	46373	44.5	26.36		175923
78	China	23863	269000	62.3	21.4		1257009

*CAGR: Compound Annual Growth Rate
(Source: ITU, 2004)

4.3 HANDSETS

In countries other than Japan, each mobile operator sells its SIM cards to customers along with mobile phone handsets specified by the mobile handset vendors. In turn, mobile phone handset vendors sell their handsets to mobile operators or directly to customers. The key factors by which customers decide on a mobile company are price and brand of the handset. Therefore mobile operators have no motivation to customize the handsets for their original services.

In Japan mobile operators developed new services that worked on their own mobile network and then ordered handset vendors to develop handsets that met those specifications. This relationship between mobile operators and mobile handset vendors resulted in numerous innovations in mobile Internet services, and this vertically integrated service became rapidly diffused in Japan. I will discuss this process in greater detail in the next chapter.

Following Japan's success with its mobile Internet service, major mobile operators began developing relationships with mobile handset vendors. For instance, Vodafone ordered handsets for its service (called "Vodafone live!") from Nokia, Motorola, and other major vendors. Although the service was based on standard technologies, it caused additional costs to the vendors to customize their handset's software to Vodafone's specifications.

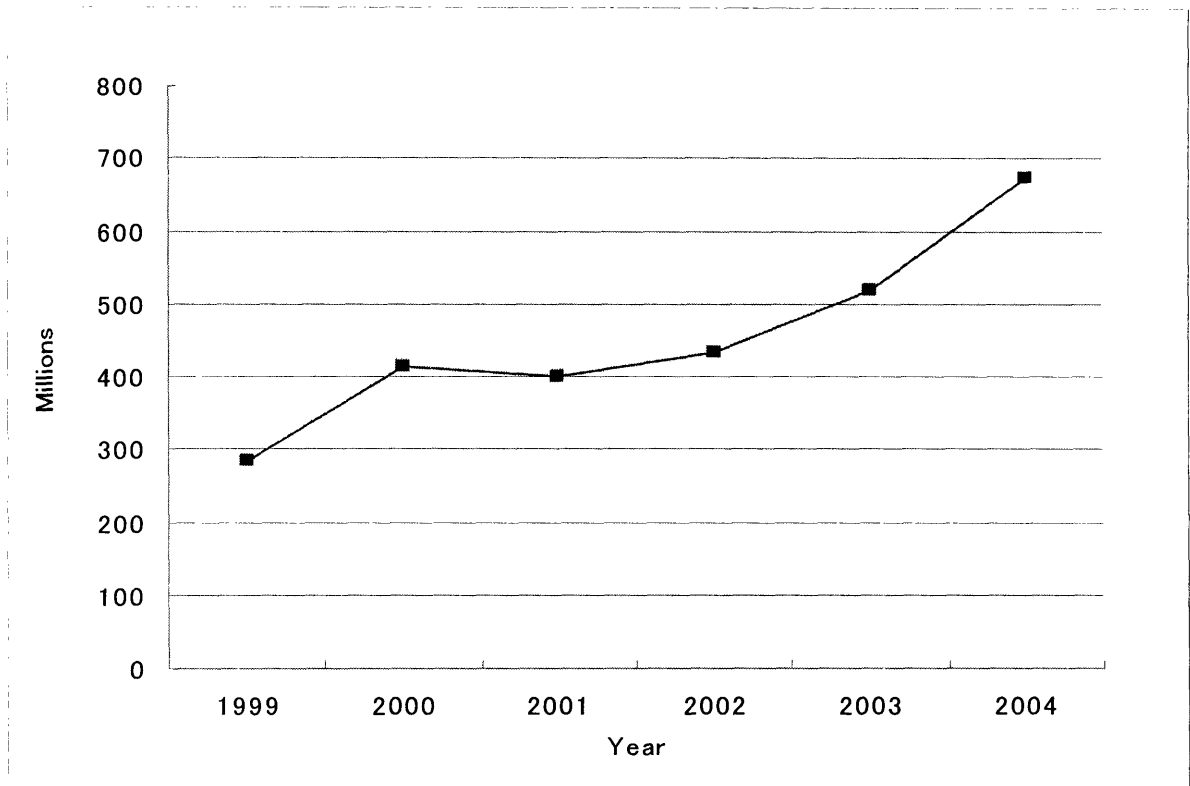
Regarding handset functions, the trend has shifted from simple to complex. With ever-developing new innovations and technologies, mobile handsets continually evolve into PC-like gadgets. When cameras were embedded in mobile phones, it was huge hit with consumers around the world. A summary of the handset's functional trends is shown in Table 4-3.

Table 4-3 Comparison of mobile handset functions

Function	Late 1990s	Early 2000s
Network	Circuit switching (Voice)	Circuit switching (Voice) Packet switching (Data)
Size	Small, Light	Small, Light / Large, Heavy
Sound	Monophony ring tone	Polyphony ring tone, Music player
Display	Monochrome, Small	Color, Large
Design	Conservative, Candy bar	Radical, Clamshell
Messaging	SMS	SMS/MMS/E-mail
Internet	WAP browser	XHTML browser
Connection to PC	Cable	Cable, Blue tooth, IrDA
Additional		Camera, Memory card, JAVA

Source: Author, 2005

After 2001, shipments of mobile handsets increased exponentially (see Figure 4-2). Customer demands in North America and Western European countries, to replace existing handsets with new models, contributed to this growth. In addition, the market size increased dramatically in Central and South American countries.



Source: Gartner, 2000-2005

Fig. 4-2 Worldwide mobile phone shipments, 1999 to 2004

For a long time, Nokia held the number one position in the mobile phone market. However, in 2004 Nokia's market share dropped from 34.8 % to 30.7 %, because competition became much stronger. Korean companies, specifically Samsung and LG, have continued to increase their market share. Mobile phone vendors aim to increase sales in the high-end segment which has a higher profit margin. To date, Japanese handset vendors have not been successful in the world market.

Table 4-4 Worldwide mobile phone shipments and market share

Rank	Vendor	2004		2003	
		Shipment (Millions)	Market share (%)	Shipment (Millions)	Market share (%)
1	Nokia	207	30.7	180	34.8
2	Motorola	104	15.4	75	14.5
3	Samsung	85	12.6	54	10.5
4	Siemens	48	7.2	44	8.4
5	LG	42	6.3	26	5.0
6	Sony Ericsson	42	6.2	27	5.1
	Others	145	21.6	113	21.7
	Total	674	100	520	100

Source: Gartner, 2005

4.4 INTRODUCTION OF 3G SERVICE

After several 3G license auctions in 2000, the financial status of mobile operators in European countries became worse. This caused them to be very careful about introducing 3G services. Moreover, 3G systems based on the W-CDMA standard were technologically challenging, and equipment vendors were struggling to develop network equipment and handsets.

In Japan, however, NTT DoCoMo launched its 3G service, named FOMA, based on W-CDMA technology—the first in the world—in 2001. At first the service was not especially good because it was limited to a small service area, the handsets were large and had a short standby time, and connections were poor. This poor perception causes the company's market share to suffer. At the same time, NTT DoCoMo's competitor, KDDI,

increased its market shares by using another 3G standard, CDMA2000 1X. The problems were gradually resolved after thousands of hours of field research and enormous infrastructure investment. As a result, NTT DoCoMo announced that in Q1 2005, the number of FOMA subscribers now exceeds ten million.

In 2004 the mobile operators that waited to begin 3G service because its poor quality announced they would begin 3G service. Those companies needed differentiated products in order to compete with the other companies in this mature market.

4.5 ALLIANCES

To survive in the competitive mobile market, some companies are entering into alliances or groups between different countries. The objectives of an alliance are mainly cost reduction of handsets or network equipment through mass procurements, and continuous growth achieved through synergies in global services. I discuss four major alliances or groups in the following sections.

4.5.1



Vodafone Group is the largest mobile company in the world. It has interests in 26 countries on five continents. In 2004, the company had approximately 151.8 million registered customers calculated. In addition, the company has partner networks in fourteen other countries. Under its unified brand name “Vodafone,” the company manages by using economies of scale. For example, the group ordered 3G handsets with globally unified specifications from several major mobile handset vendors. The group also provides the same services in different countries, including “Vodafone live!,” a comprehensive service that

offers messaging, browsing, games and music, and Eurocall—a single-rate roaming service within European countries.

4.5.2

FreeMove consists of four large mobile operators: Orange SA, Telefónica Móviles, TIM, and T-Mobile. The alliance claims nearly 170 million customers in 21 European territories, and 230 million customers worldwide. The alliance aims to develop synergies in business solutions, including a fixed-price roaming package for BlackBerry e-mail users, and roaming service and joint handset procurement from Siemens and Motorola.

4.5.3

The Starmap Mobile Alliance is a union of eleven mobile operators: Amena (Spain), Eurotel (Czech Republic), O2 (Germany, the UK and Ireland), One (Austria), Pannon GSM (Hungary), SONOFON (Denmark), Sunrise (Switzerland), Telenor Mobil (Norway) and Wind (Italy), with a subscriber base of more than 53 million.

The alliance aims to develop seamless GPRS and MMS roaming services across its network. Members cooperate on the definition and development of 3G handsets and have entered into a strategic partnership with Sony Ericsson.

4.5.4

NTT DoCoMo is developing international i-mode alliance that includes E-Plus Mobilfunk GmbH & Co. KG (Germany), KPN Mobile N.V. (Netherlands), Far EastOne

Telecommunications (Taiwan), BASE N.V./S.A (Belgium), Bouygues Telecom S.A. (France), Telefonica Moviles Espana (Spain), Wind Telecomunicazioni SpA (Italy), COSMOTE Mobile Telecommunications S.A (Greece), Telstra Corporation Limited (Australia), Cellcom (Israel), mmO2 (UK, Ireland and Germany) and MTS (Russia).

Through these and other partnerships, NTT DoCoMo is sharing its technology and know-how and building relationships that support content diversity for the maximum benefit of subscribers.

4.5.5 OMTP Group

The Open Mobile Terminal Platform group (OMTP) was established by mmO2, NTT DoCoMo, Orange, SMART Communications, Telefónica Móviles, TIM (Telecom Italia Mobile), T-Mobile, and Vodafone in June 2004.

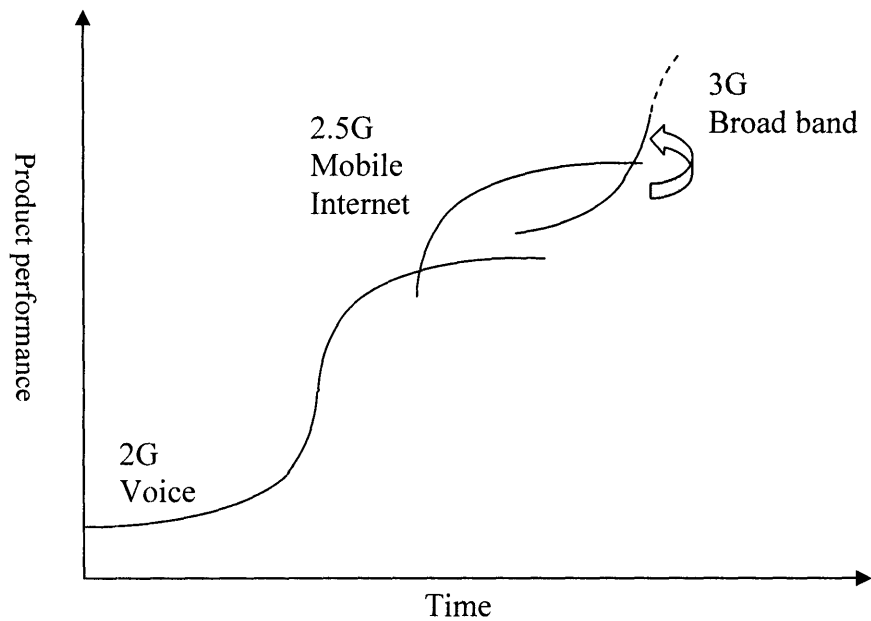
OMTP Group identifies common mobile operator requirements with the aim of establishing an open framework for mobile device manufacturers and associated software and hardware suppliers to develop open mobile terminal platform-compliant products. OMTP Group aims to use existing standards and to further encourage the development of standards by presenting OMTP requirements.

4.6 SUMMARY

In this chapter I described several trends in the mobile industry beginning in the late 1990s to the early 2000s.

Two innovations had a major impact on the decade: mobile internet service and 3G service. Mobile internet service was an incremental innovation based on existing

technologies, and it was accepted by customers immediately. On the other hand, 3G service was a disruptive innovation based on new technologies standardized by ITU, and it was introduced as a result of demands by the mobile operators themselves. Therefore customers were much slower in accepting it. Figure 4-2 shows that process.



Source: Author, 2005

Fig. 4-2 S-curve of the mobile industry

In terms of markets, Japan has a low penetration rate compared to Western European countries. However, prepaid service is less desirable if one considers long-term profitability.

The relationships between mobile operators and mobile handset vendors are changing to alliances similar to those in Japan. However, to date those alliances have not produced great results.

Chapter 5

Structure of the Mobile Industry in Japan

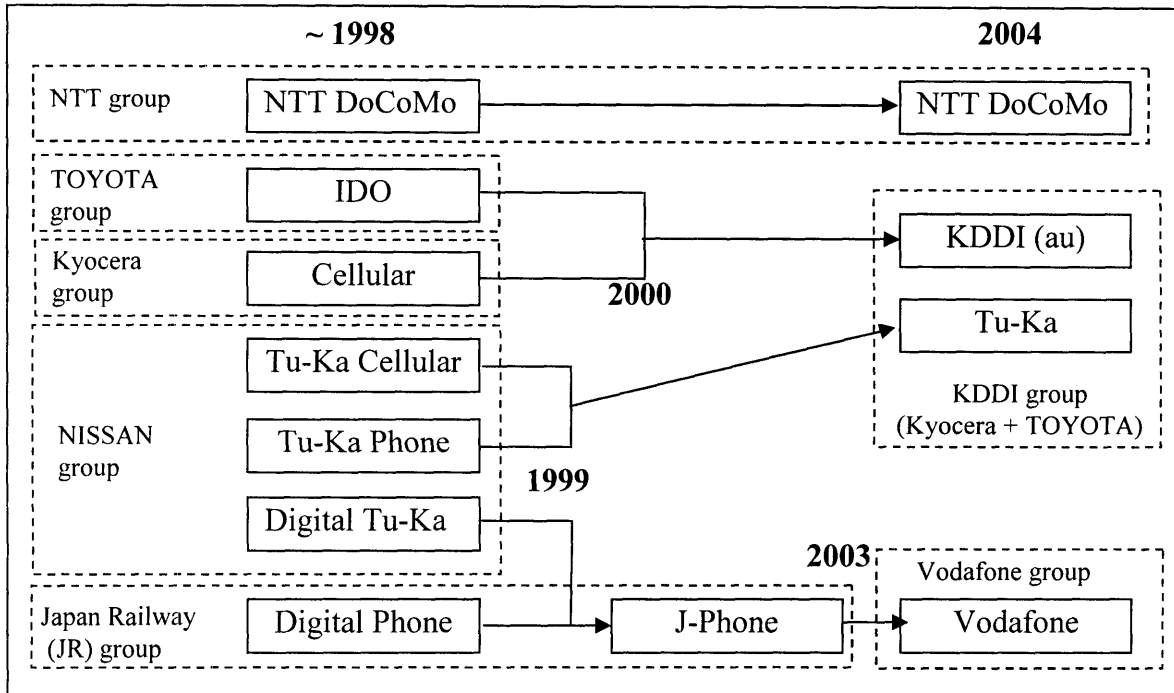
In this chapter I describe the structure of the mobile industry in Japan by using several analytical frameworks. First I will analyze the profitability of the industry by using Michel Porter's Five Forces Model. Then I will analyze the dynamics of the current mobile industry in Japan. Finally, three threats against incumbents are mentioned, and a system dynamics model is modified by those threats.

5.1 PORTER'S FIVE FORCES MODEL

In Japan's mobile industry, mobile operators have enjoyed a profitable market since they began their businesses, although there have been many M&As and recessions. I have analyzed the current mobile industry in Japan to determine why it has been so profitable using Porter's Five Forces, as follows.

(1) Rivalry among competitors: *Medium*

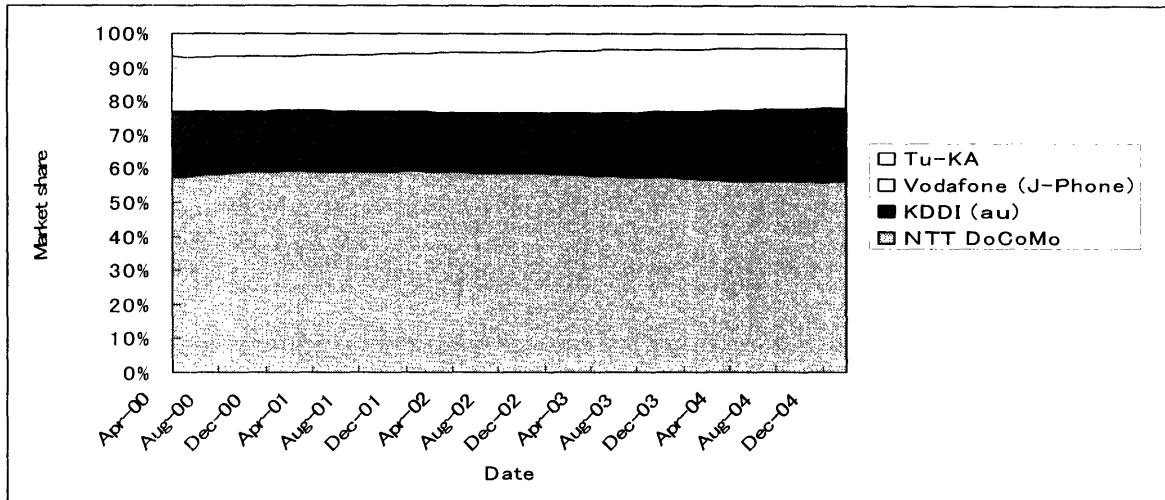
In 2004, there were four companies—NTT DoCoMo, KDDI, Vodafone and Tu-ka—in the mobile industry in Japan. Except for NTT DoCoMo, the other three companies were formed by local mobile operators and their owners have changed (see Figure 5-1).



Source: Author, 2005

Fig. 5-1 Transition in mobile operators

In terms of market share, NTT DoCoMo holds more than 50%, followed by KDDI with 20%, and Vodafone with slightly less than KDDI. Tu-Ka has a small portion compared to the other three companies. These companies compete with each other on the basis of attractive handsets with various features, prices, and new services. As a result, market share has generally remained similar since the four companies were formed in 2000, as Figure 5-2 shows.



Source: TCA, 2005

Fig. 5-2 Market share of the mobile market in Japan

In the late 1990s, severe competition between the companies caused a price war. As Figure 5-3 shows, in 2000 the charge for a three-minute call dropped to ¥70, about one-quarter of the charge per call of ten years earlier. Moreover, retail shops received a subsidy as a sales incentive, so they decreased the price of handsets, some as low as zero yen. This price war simply accelerated expansion of the number of subscribers.

Since 2000, however, competition shifted from price to various offerings of mobile internet services. Each company provided discount plans including a carryover of the communication allowance to subsequent months; a discount on charges between families; and a flat rate for mobile internet services in spite of the decreased call charge. This price discount strategy and subsidy effectively decreased the companies' profit in the mature market in which growth in the number of subscribers was slowing down.

Mar. 83 Mar. 84 Mar. 85 Mar. 86 Mar. 87 Mar. 88 Mar. 89 Mar. 90 Mar. 91 Mar. 92 Mar. 93 Mar. 94 Mar. 95 Mar. 96 Mar. 97 Mar. 98 Mar. 99 Mar. 00 Nov. 01 Mar. 02 Aug. 02 Dec. 02

Deposit	¥200,000 → ¥100,000 → Abolished
Subscription fee	¥80,000 → ¥72,000 → ¥45,800 → ¥21,000 → ¥9,000 → ¥6,000 → Free
Monthly basic charge	¥30,000 (Analog) → ¥18,000 → ¥15,000 → ¥9,500 → ¥8,400 → ¥6,600 → Abolished (800MHz, digital) ¥8,800 → ¥6,800 → ¥4,900 → ¥4,500
Call charge (3 minutes)	¥280 (Analog) → ¥260 → ¥230 → ¥200 → ¥150 → Abolished (800MHz, digital) ¥260 → ¥200 → ¥180 → ¥110 → ¥80 → ¥70 (Dec. 2000)

Note: Figures are cellular phone rates of NTT DoCoMo (standard plan rate for 3 minutes during daytime hours on weekdays [when the person receiving the call is using a standard telephone within the central business zone of NTT DoCoMo]).

Source: MIC, 2004

Fig. 5-3 Price reduction in NTT DoCoMo

(2) Entry barriers - **High**

The mobile communication business in Japan is restricted by the government because spectrum resources are limited. Table 5-1 shows the current allocation of spectrum for mobile operators. There is no availability for new entrants seeking bandwidth for a new service.

Table 5-1 Allocation of spectrum

	800MHz	1.5GHz	2GHz
NTT DoCoMo	29MHz × 2	5.5MHz × 2	15MHz × 2
KDDI (au)	15MHz × 2		15MHz × 2
Vodafone		11.5MHz × 2	15MHz × 2
Tu-Ka		10MHz × 2	

Source: MIC, 2004.

Infrastructure cost is also an important issue for new entrants. Service that works nationwide is very attractive to customers, but to achieve such coverage requires a huge investment. For example, NTT DoCoMo invested \$10 billion over three years to build its nationwide 3G network. Although a national roaming service or MVNO (Mobile Virtual Network Operator) among incumbents would decrease costs, arranging a contract between incumbent service providers would be very difficult.

The number of channels is a critical factor. The incumbents have broad networks for selling their handsets, promoting new services, and providing aftersale service. For example, NTT DoCoMo has 144 shops offering storefront service to customers in Tokyo.

(3) Power of Suppliers - **Low**

As described in Chapter 4, in Japan's mobile industry all handsets are sold under each mobile company's brand. On the other hand, network equipment vendors can sell their products to all mobile operators because their products' interfaces are standardized. However, NTT DoCoMo has R&D departments that have developed new technologies for next-generation standards, and these are usually developed based on feedback from its vendors. In addition, the company is able to add new functions to its network equipment unilaterally. The relationship between mobile operators and their vendors is shown in Table 5-2.

Each mobile company provides their own unique services by using network equipment and handsets that have been customized for those services. The relationship between mobile operators and their handset vendors has worked well for the Japanese mobile market, so handset vendors maintain good relations with the mobile operators.

Table 5-2 Handsets and network equipment vendors

	Handset vendors	Network equipments vendors
NTT DoCoMo	NEC, Fujitsu, Panasonic, Mitsubishi, Sony-Ericsson, Sharp	NEC, Fujitsu, Panasonic, Ericsson, Lucent
KDDI	Kyocera, Sanyo, Casio, Toshiba, Hitachi, Sony-Ericsson	Motorola, Hitachi, Fujitsu, Samsung
Vodafone	NEC, Hitachi, Sharp, Sony-Ericsson, Nokia, Motorola, Toshiba, Sanyo, Mitsubishi	Motorola, Nokia, NEC
Tu-Ka	Kyocera, Toshiba, Sanyo	NEC, Motorola

Source: Each mobile operator's website, 2005

(4) Power of Buyers - **Medium**

Although the mobile operators are providing new handsets and new services, the functions being offered are actually overshooting customer demands. Moreover, in terms of service quality, the mobile operators have almost completed building their networks. Therefore it is very difficult for customers to determine much difference between the companies' products and services, so customers tend to be attracted by the retail price of the handset.

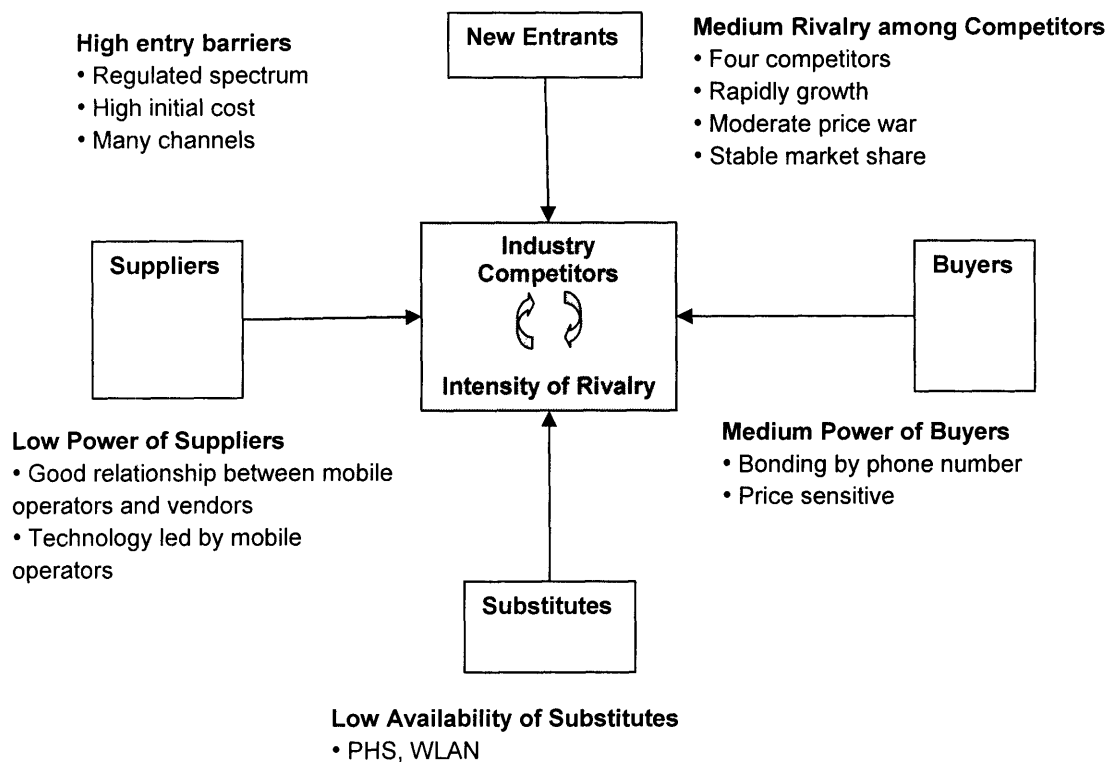
For customers who have already bought a handset, however, it is very difficult to switch to another mobile company since their phone number will also have to change. Although the cost to buy a new handset from another company is not that expensive because of the subsidy, the bigger hassle for customers is having to inform everyone in their address book about their new phone number. That tends to reinforce the bond of customers with their present mobile service provider.

(5) Availability of Substitutes - **Low**

There are two possible substitutes for mobile service in Japan: the Personal Handy phone System (PHS) and wireless LAN. However, these services do not represent a threat to mobile service providers for the following reasons:

- PHS started in 1995 as a complement to mobile phones that functioned only in a small area, with low mobility and a low price. Three companies provided PHS service: NTT Personal from NTT, DDI Pocket from DDI, and Astel from the power companies. However, with the price war in the mobile market, their price advantage weakened and the total number of customers has declined since 1997. Some companies shifted their strategy from voice service to data service, while others offered a flat rate service for data. Although this strategy brought back some subscribers temporarily, the general trend is still a declining in the number, and companies in Astel Group have been liquidated one after another.
- Wireless LAN has penetrated strongly in Japan, following the equally strong penetration of PCs equipped with wireless LAN and broadband internet connections like DSL. IEEE802.11b, .11a, and .11g are the major standards in use. IEEE802.11b can provide data transmission speeds up to 11 Mbit/sec while .11a and .11g provide transmission speeds up to 54 Mbit/sec. Wireless LAN also offers easy wireless access to the internet in offices and homes. However, wireless LAN services in public spaces, called “hotspots,” have not yet become successful because of the small number of people who use a PC outside their office or home compared to the U.S., as well as the relatively high price, and limited service area. Most Japanese people prefer to use their mobile phone for e-mail, which is quick and does not require the use of a PC.

My analysis of the mobile industry in Japan is summarized in Figure 5-4, which shows that each of the forces works to the advantage of the incumbents mobile service providers. In particular, the high entry barrier and low availability of substitutes keeps incumbents profitable with little outside threat. In addition, the relationships between mobile operators and vendors, and the bond caused by loyalty to a user's phone number, also play an important role in keeping the industry profitable.



Source: Author, 2005

Fig. 5-4 Porter's Five Forces applied the mobile industry in Japan

5.2 GROWTH DYNAMICS OF THE MOBILE INDUSTRY IN JAPAN

In this section, I will analyze the mobile phone industry in Japan using a system dynamics model. The analysis identifies the source of growth in the industry.

First, I created and analyzed a profit dynamics model which shows how mobile operators earn profit. Second, I created a customer growth dynamics model which shows what variables influence customers to subscribe to a mobile company's service. Then I focus on two variables—product functionality and service functionality—which play important roles in the customer growth dynamics model. Those two variables are involved in each dynamics model. In the system dynamics model analysis, some specific growth factors for the current industry are shown.

5.2.1 Profit Dynamics Model

Profit dynamics is the process by which mobile operators make money. There are three kinds of revenue from operations: (1) revenue from monthly charges, (2) revenue from communication charges, and (3) revenue from handset sales.

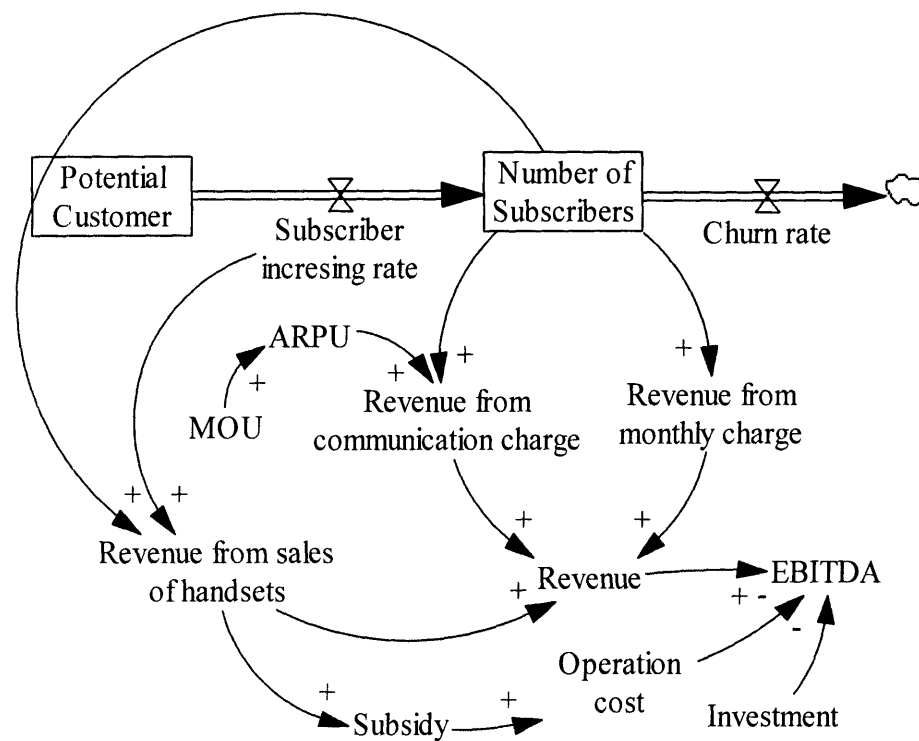
Revenue from monthly charges includes the basic charge for voice communication and data transmission, minus some communication allowances, plus a service charge for extra services such as voice mail and call waiting. Since the monthly charge has to be paid even if a subscriber does not use the service in that month, the company can count on this revenue according to the number of subscribers that will be paying every month.

On the other hand, *revenue from communication charges* is dependent on how much the subscribers use their services in a month. For this revenue evaluation, ARPU (Average Revenue Per User) and MOU (Minutes Of Usage) are used. If the communication charge is

reduced, companies have to somehow encourage subscribers to use their services more in order to maintain ARPU.

Revenue from handsets occurs when potential customers buy the company's handset at the time they enter into a new contract or when customers who are already subscribers replace an old handset with a new one. However, mobile operators pay retail shops a subsidy to sell handsets, as a way to increase the number of new customers who will then provide added revenue from monthly charges or increased revenue from handsets.

Each company's profit is calculated by the difference between these three kinds of revenue, as well as operating costs and investment (see Figure 5-5).



Source: Author, 2005

Fig. 5-5 Profit dynamics model of the mobile industry

5.2.2 Customer Growth Dynamics

The key factors for changing a potential customer to a subscriber are attractiveness and awareness. Increased revenue enables the company to implement various strategies that reinforce the company's attractiveness as well as awareness.

There are five major factors that affect attractiveness:

1. Communication Charge (Monthly fee, price of making a telephone call),
2. Service Quality (coverage, quality of the network, mobility etc),
3. Product price (price of mobile phone),
4. Product functionality (functionality of mobile phone such as Camera, Movie etc and also including the design of mobile phone) and
5. Service functionality (On-line shopping, email, music, movie etc).

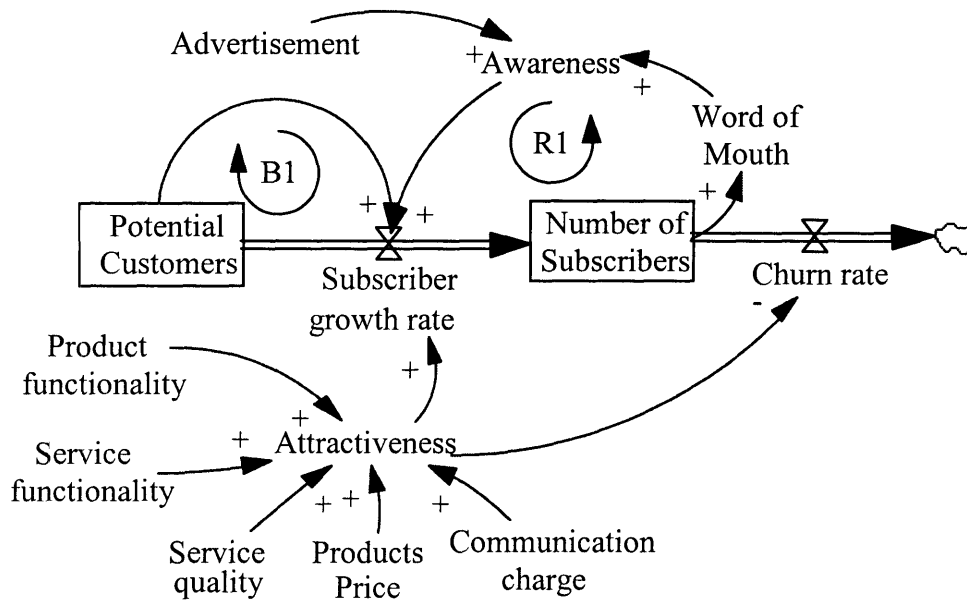
Communication charge directly affects ARPU, therefore companies want to avoid price wars. Instead companies promote discount plans including reasonable communication allowances and flat rate plans for mobile internet services.

Regarding service quality, each company continually invests in infrastructures, such as antennas, base stations, and switches, for the purpose of improving service quality by offering greater opportunities to utilize the network company's mobile phone service.

As described earlier, subsidy affects product price at retail shops, and price is very attractive to customers. Therefore the companies cannot stop or reduce subsidies even if such subsidies reduce their profit.

Product functionality and service functionality have their own system dynamics model. In it, less Attractiveness causes Churn which decreases ARPU. In addition, a limited number of Potential Customers causes saturation of Subscriber Growth Rate. The purpose of

Advertisement is primarily to enhance Awareness. Effective Advertisement also enables customers to differentiate the company from its competitors through brand image. Word of Mouth plays an important role, making a reinforcing loop of Awareness.



Source: Author, 2005

Fig. 5-6 Customer growth dynamics model of the mobile industry

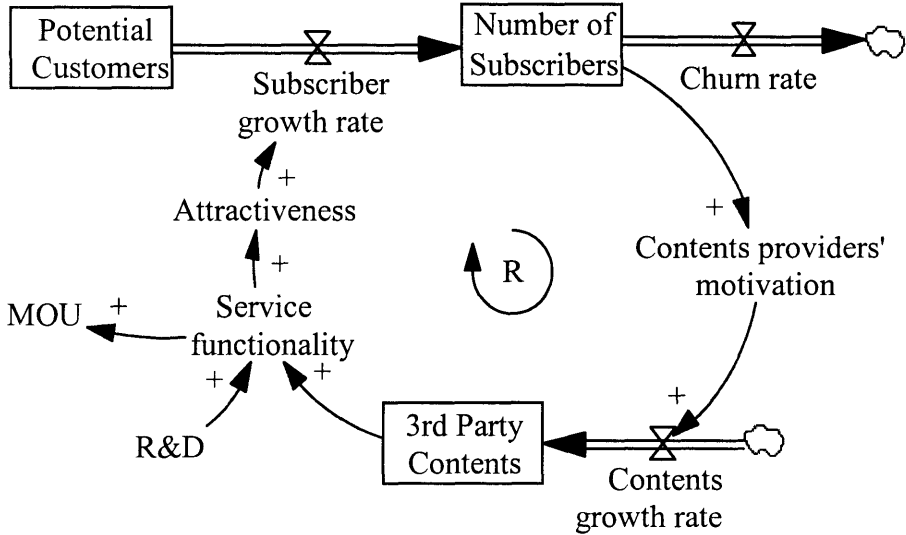
5.2.3 Product Functionality Dynamics

Product Functionality is improved by R&D, which can be divided into two parts: the mobile operator's own R&D, and joint R&D between a mobile operator and the mobile phone manufacturers.

A mobile operator's own R&D focuses mainly on incremental or disruptive innovations of service (both quality and functionality) and can be used to enhance network efficiency which leads to a competitive communication charge. On the other hand, most mobile operators let OEM manufacturers produce mobile phones through joint R&D

contents and unofficial contents. Official contents are accepted by the mobile operators; they are listed portal sites and can use a billing system provided by the mobile operators. Though unofficial contents cannot be restricted by the mobile operators, they have to use their own billing system if they want to be paid for subscribers who use their contents.

Both contents providers are motivated by Number of Subscribers because the more subscribers, the more profit they can expect to earn. Increasing of Number of Contents improves Service Functionality and Attractiveness. This process creates a reinforcing loop of service quality. In addition, Attractiveness increases MOU which contributes to increased revenue. Mobile operators are adding new function in their network and handsets to encourage this reinforcing loop.

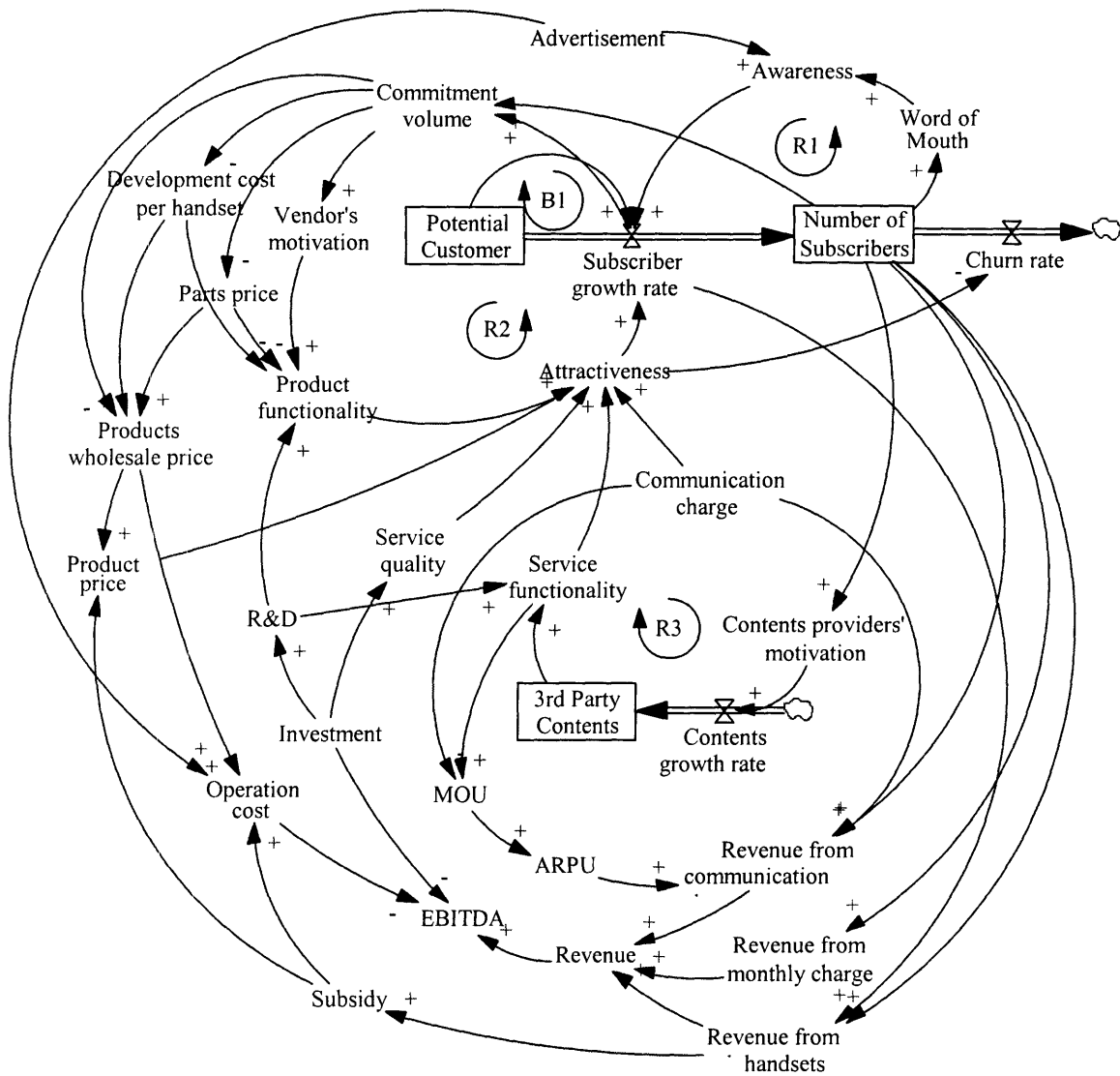


Source: Author, 2005

Fig. 5-8 Service Functionality system dynamic model of mobile industry

5.2.5 System Dynamics Model of the Current Mobile Industry in Japan

By combining the four prior system dynamics models, I created Figure 5-9 which shows how each individual model relates to the whole model.



Source: Author, 2005

Fig. 5-9 System dynamics model of the current mobile industry in Japan

Product functionality dynamics and service functionality dynamics are connected to profit dynamics by attractiveness. Those two dynamics create reinforcing loops triggered by the number of subscribers. On the other hand, an increase of MOU is the result of an

increase of service functionality and decrease of operation cost by increase of commitment volume contribute to increase of profit.

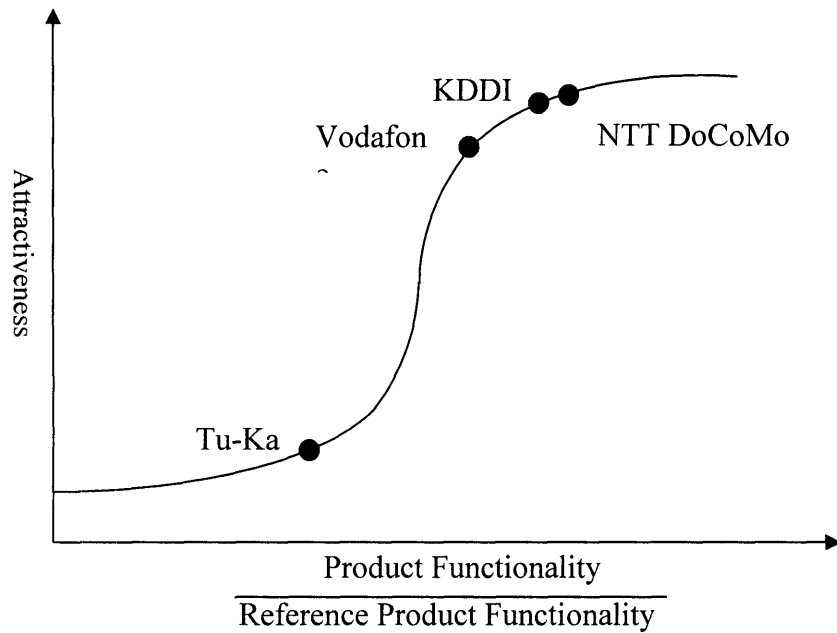
5.3 STRATEGIES OF KEY PLAYERS

Now I can analyze the strategies being pursued by mobile operators based on five factors which affect attractiveness: Product functionality, Product price, Communication charge, Service functionality, and Service Quality.

5.3.1 Product Functionality

Product function is the most sensitive factor for consumers. Highly functional handsets attract consumers. NTT DoCoMo has led product functionality in the industry with its JAVA and Flash functions. However, KDDI and Vodafone are beginning to catch up with DoCoMo's functions. Moreover, KDDI and Vodafone are also providing their own original functions which are attractive to consumers, for example, novel handsets designed by *au* design project, a music player function, and a TV function. Recently, however, the functions have tended to overshoot customer demand and have not contributed to differentiating between mobile operators.

Tu-Ka's strategy is different from the other mobile operators. Tu-Ka keeps its handsets simple. Its model "Tu-Ka S" has no display, no camera, and features large buttons. The handset appeals to customers who are less comfortable with mobile phone, such as senior citizens. The response curve for Product Functionality is shown in Figure 5-10.



Source: Author, 2005

Fig. 5-10 Effect of Product Functionality on Attractiveness

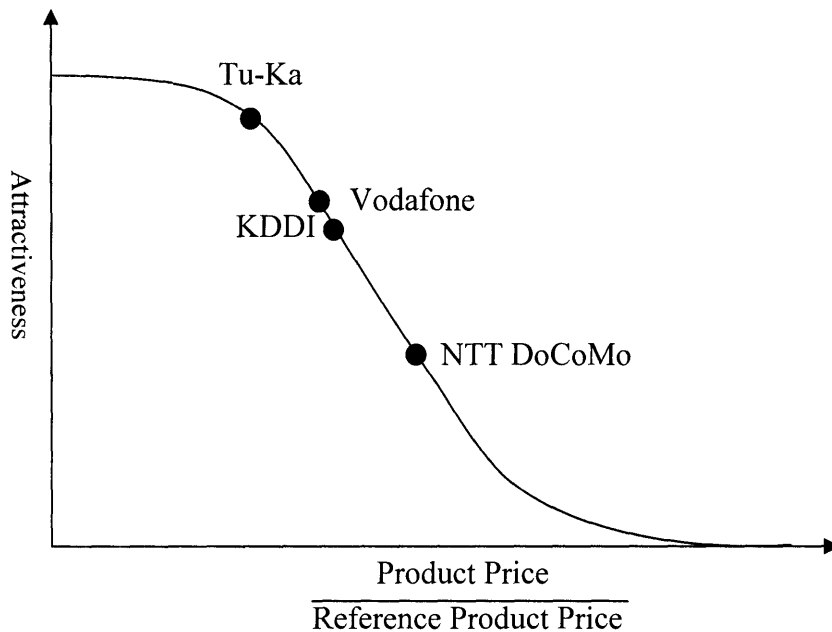
5.3.2 Product Price

Product price affects consumers who buy a handset in a retail shop. However, that sensitivity is lower than Product Functionality. In terms of product price, NTT DoCoMo has kept its price higher than its competitors because of its well-known strong brand, even when competitors' handsets are sold for one yen because of high subsidies from those companies. To compete with its competitors' prices, NTT DoCoMo has developed a low-end handset series called the 700 series, which uses an existing platform and has fewer functions.

Vodafone has the advantage of wholesale prices for 3G handsets by using a worldwide Vodafone group procurement strategy. However, global specifications are

difficult to customize for domestic demand, therefore to date Vodafone is struggling to sell those handsets.

For all mobile operators, subsidies are very important for getting new customers, although too much subsidy results in decreasing profit. Therefore the effort to decrease wholesale price is necessary for financial growth. The response curve of product price is shown in Figure 5-11.



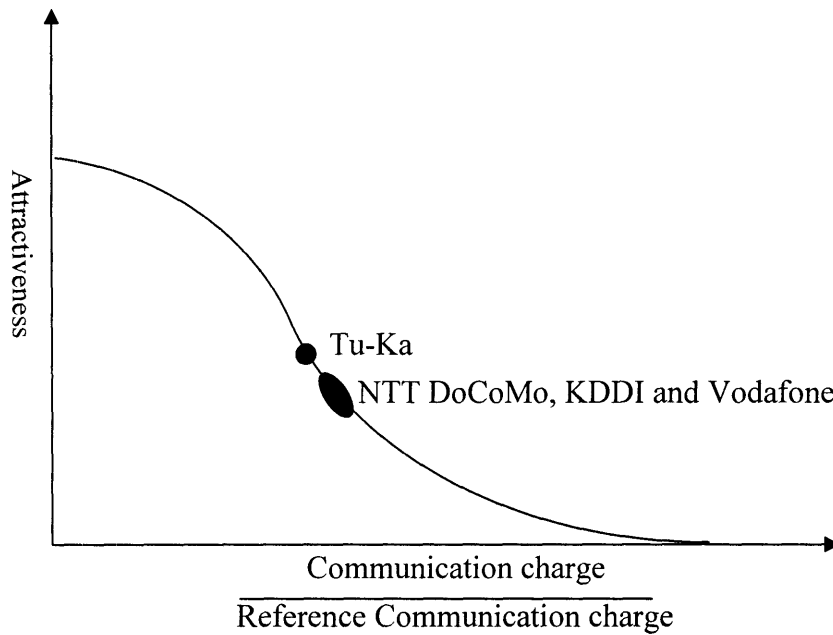
Source: Author, 2005

Fig. 5-11 Effect of Product Price on Attractiveness

5.3.3 Communication Charges

Each company's communication charges are not that different, and each company also offers various discount plans. Therefore it is difficult for consumers to determine which company is the least expensive. Among the companies, KDDI aggressively advertises its

discount plan, including a student discount named *Gaku-wari* and a flat rate plan for mobile Internet service, the first in Japan. Tu-Ka provides a discount plan based on its simple strategy. The response curve for Communication Charges is shown in Figure 5-12.



Source: Author, 2005

Fig. 5-12 Effect of Communication Charge on Attractiveness

A comparison of communication charges between the mobile operators is difficult to do because there are many plans based on usage. Therefore the three companies are located in the same position on the curve.

5.3.4 Service Functionality

Service functionality affects not only attractiveness but also the amount of data transactions which in turn increases revenue. NTT DoCoMo has led the industry with its

mobile internet service called i-mode. However, these days service functionality has been commoditized because many third-party content providers offer the same contents to all companies. In this circumstance, the mobile operators have moved forward with their original strategies.

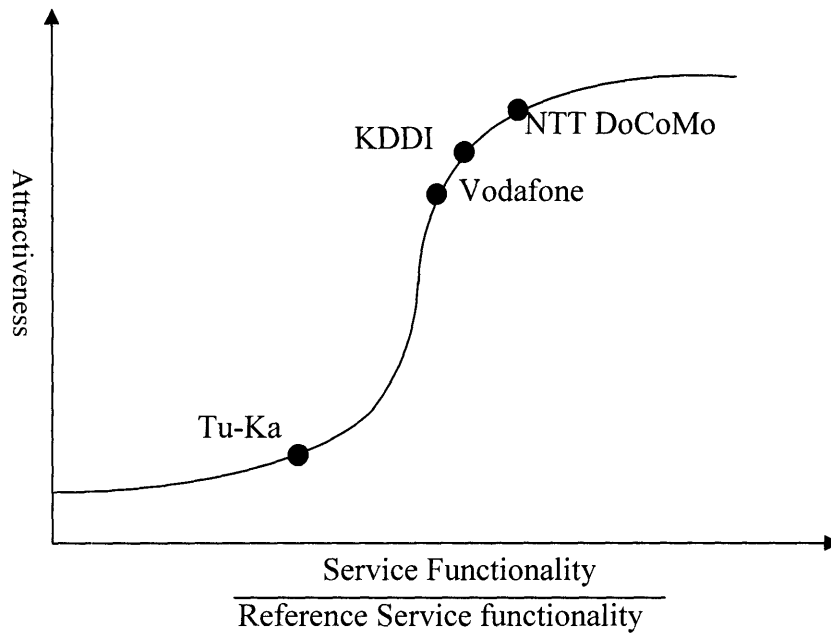
NTT DoCoMo promotes a shift from 2G to 3G. In addition by embedding its contactless IC card named FeliCa, the company aims to expand its market.

KDDI's strategy is based on its CDMA2000 EV-DO network. The company promotes a rich contents download service that includes music and movies. In addition, KDDI plans to converge its regular services, mobile services, and fixed services.

Vodafone's strategy is characterized by globalization. The company tries to exploit Vodafone Group's scale economies. Vodafone Live! is its typical service based on standardized technologies in use in the Vodafone Group. In addition the company promotes global roaming service on their W-CDMA/GSM dual-function handsets. Compared to the former two companies, Vodafone is late in making the transition from 2G to 3G.

Tu-Ka's strategy has been to keep its services simple, and the company aims to identify and fill niche segments.

The response curve for Service Functionality is shown in Figure 5-13.

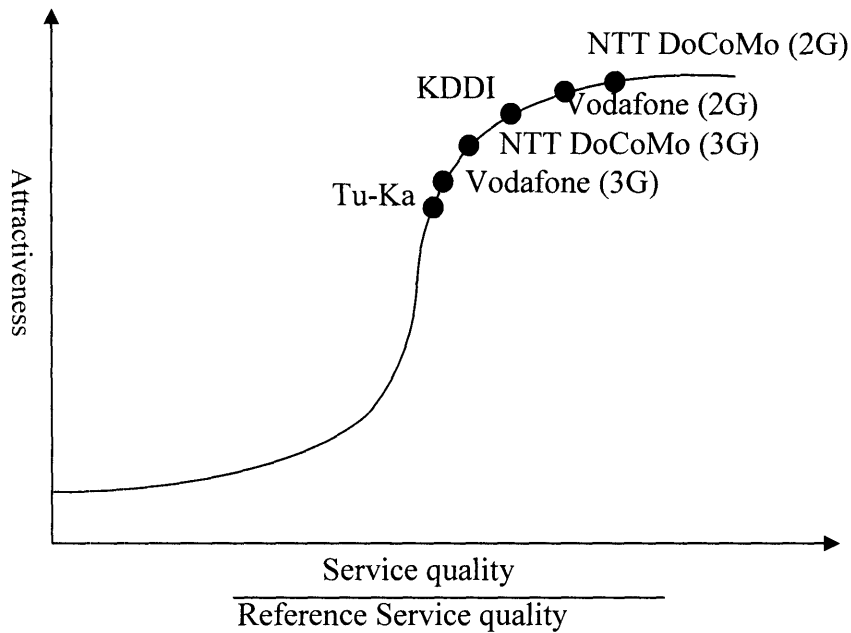


Source: Author, 2005

Fig. 5-13 Effect of Service Functionality on Attractiveness

5.3.5 Service Quality

In the early stages, Service Quality included service area, capacity, and voice quality all of which were important to consumers. However, all companies have now built their infrastructure and have attained sufficient good quality. Therefore Service Quality is not as important for consumers when they consider choosing a company, although all the companies still invest in service quality, including capacity and service area. The response curve of service quality is shown in Figure 5-14.



Source: Author, 2005

Fig. 5-14 Effect of Service Quality on Attractiveness

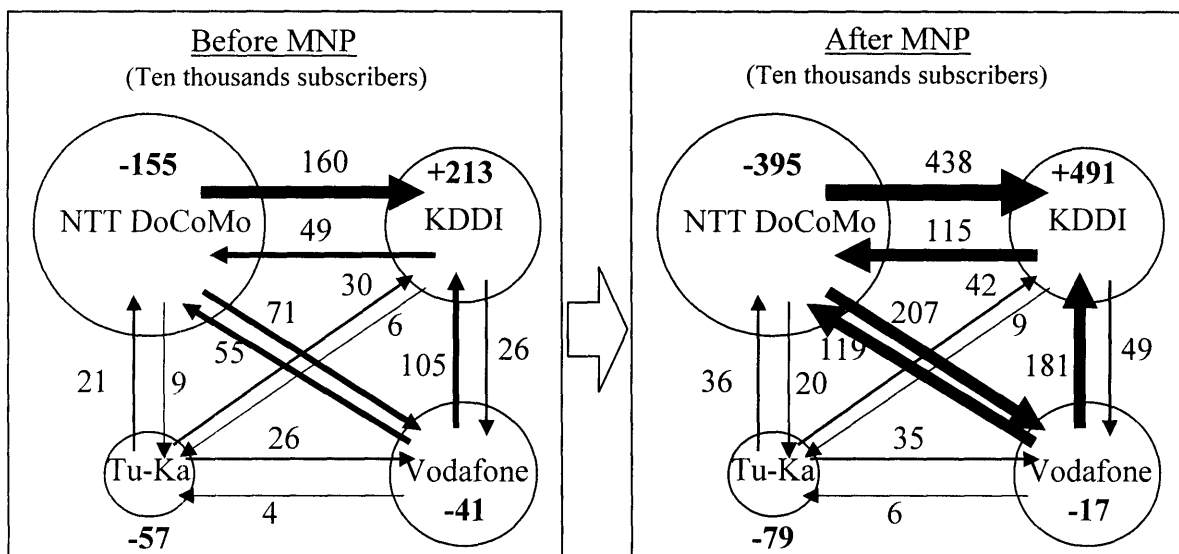
5.4 THREAT

In this section, I will discuss threats that may dramatically change the dynamics of the mobile industry. These are mobile number portability, flat rate, new entrants, and globalization. Each threat has the potential to change the dynamics mentioned in the earlier sections.

5.4.1 Mobile Number Portability

Mobile number portability (MNP) is a relatively new system that allows consumers to change their mobile company without giving up their current phone number. In May 2004, Japan's Ministry of Internal Affairs and Communications (MIC) announced guidelines

concerning the introduction of MNP. The guidelines mandate that the mobile operators must introduce MNP for their 2G and 3G service by early 2006. According to a report by Nomura Research Institute, MNP will accelerate churn between mobile operators (see Figure 5-15). This will cause strong competition based on price and services, although it will also depend on how convenient customers find the system. A price war may exhaust the mobile operators, and customers' (buyers') power will be enhanced because of low switching costs.



Source: Nomura Research Institute, 2004

Fig. 5-15 Expectations of churn among mobile operators

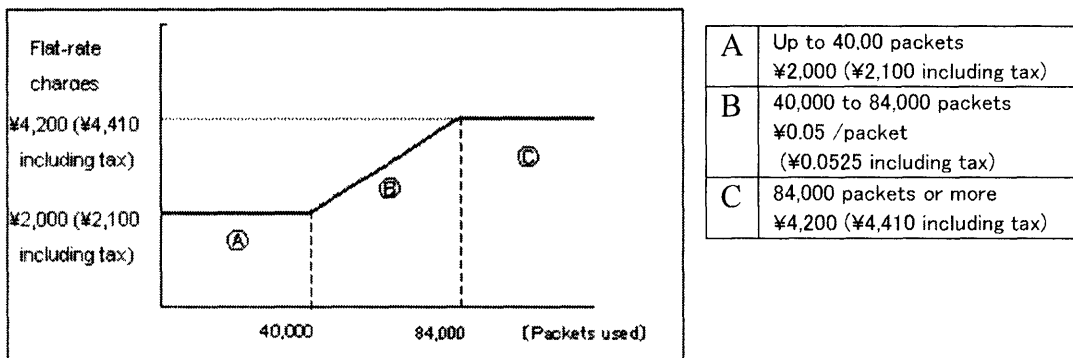
On the other hand activation of a mature mobile market is expected with the onset of innovative services. For example, Korea gradually began to introduce MNP in January 2004, and the increased marketing costs had a bad effect on most Korean mobile operators. However, the leading company, SKT, maintained its dominant position by offering attractive handsets and new services including fixed mobile convergence (FMC). In addition, subscriber growth rate increased in the first half of 2004, although the final effect of MNP will need to be determined after introduction is complete.

5.4.2 Flat Rate

In Japan, flat rate plans for data communication services were begun by PHS company, DDI Pocket in 2001, and leveraged growth of PHS subscribers subsequently declined. NTT DoCoMo followed with its own flat rate plan for its PHS service in 2003. The service is enabled by advanced radio access control protocol and lower network costs using IP technology.

Following PHS, most mobile operators began to offer flat rate service, although their service applied only to use of their own mobile internet services and did not include data transmission via PC because of higher traffic.

KDDI began its flat rate plan, named EZ-flat in 2003. The company aggressively promoted its flat rate plan and established its brand image as a broadband mobile service provider. NTT DoCoMo and Vodafone followed with their own flat rate plans in 2004.



Source: KDDI website, 2005

Fig. 5-16 Flat rate plan by KDDI

On the other hand, WILLCOM changed from DDI pocket and announced that the company will begin flat rate service for voice communication within its own network.

Although a flat rate plan is attractive for heavy users, the plan stops revenue from communication charges based on MOU. Therefore mobile operators have to consider how to make money if they choose to offer a flat rate plan.

5.4.3 New Entrants

Since MIC announced it would reorganize bandwidth frequency allocations in 2003, new entrants from other industries have indicated they would enter the mobile industry by using state-of-art technologies (see Table 5-3). They can be categorized by their technology.

Softbank and E-access plan to use W-CDMA and CDMA2000, technology that has been already commercialized. IPmobile plans to use TD-CDMA which has not been commercialized. The technology needs to be evaluated for performance, although it is based on the IMT-2000 standard. WiMAX is the broadband wireless network based on the IEEE 802.16 standard. The network functions on a fixed-line connection similar to DSL. In 2005, mobile service IEEE 802.16e will be standardized. The problem is that frequency band for WiMAX has not been approved for use so far.

Although each company has technical and political issues, it is obvious that new entrants will offer their services at very low prices. Therefore incumbents will have to carefully monitor this movement.

Table 5-3 Services planned by new entrants

Company (Main industry)	System	Frequency band	Services	Launch date
Softbank (Fixed broadband)	W-CDMA or CDMA2000	800MHz	Nationwide service	2007
E-access (Fixed broadband)	W-CDMA (HSDPA)	1.7GHz	Start from large cities Cheap voice service Flat rate plan for data service MVNO	2006
IPmobile (Venture)	TD-CDMA	2GHz	unknown	unknown
Heisei denden (Fixed telephone)	WiMAX	unknown	unknown	2005 (Field test)
Yozan (PHS)	WiMAX	4.95GHz	Metropolitan area Flat rate plan for all services	Dec. 2005

Source: various company websites, 2005)

5.4.3 Globalization

As 3G service has become a global standard, the mobile industry in Japan has also advanced. There are no longer mobile communications boundaries between countries, and handset vendors and network equipment vendors can sell their products worldwide. However, Japanese vendors have not succeeded in entering other foreign countries because of weak brand perception among consumers. At the same time, foreign vendors have also struggled to sell their products to Japanese mobile operators because Japanese companies require that the products be customized for use in Japan. Japanese vendors like NEC and Panasonic may decide to shift their resources from Japan's limited market the larger global market. That will weaken the relationships between mobile operators and vendors. As a result, Japanese mobile operators will lose their current source of growth.

5.6 SUMMARY

In this chapter, I analyzed the sources of profitability in Japan's mobile market using Porter's Five Forces model. Then I identified and analyzed the sources of market growth by using system dynamics models. Profitability comes from high entry barriers, low availability of substitutes, strong relationships between mobile operators and vendors, and customer bonding to their phone number.

On the other hand, growth can also come from a revenue reinforcing loop generated by product functionality, product price, service functionality, communication charge, and service quality. Those factors play key roles in the system dynamics model of the mobile industry in Japan, which is leveraged by subsidies to retail shops and by R&D efforts.

The mobile operators have enjoyed enormous profit when the market was growing rapidly. However, the market penetration rate has now reached 66.6% of the population, which I believe may be among the highest penetration rates for an electronic appliance. Companies are working hard to acquire more customers from among those in the Late Majority and Laggard segments. In addition, services have become commoditized because there is little or no differentiation and because of low prices caused by price wars. These phenomena are the hallmarks of a mature market.

These sources will be affected by threats in the near future such as mobile number portability, flat rate service options, new entrants, and globalization. As mobile number portability becomes more common, it will weaken the bond that currently keeps consumers reasonably loyal to one mobile company because they do not wish to change their phone number. Flat rate service will change the business model earnings for communication charges per use. New entrants will cause severe price wars as new technologies and business

modes become widely available. Finally, globalization will cause vendors to shift their resources from the Japanese mobile operators to worldwide markets.

In the next chapter I will describe what NTT DoCoMo can do to enhance its future growth under these circumstances, particularly through the use of the growth models first described in Chapter Two.

Chapter 6

Applying the Frameworks to NTT DoCoMo

In this chapter, I describe suggestions for what NTT DoCoMo can do to further its growth by combining the three frameworks mentioned in Chapter Two with the information discussed in Chapters Four and Five. I also discuss several factors that could hinder or prevent NTT DoCoMo from applying these solutions.

6.1 INNOVATIVE ORGANIZATION

As I described in Chapter Three, innovations that result in further growth are an outgrowth of an innovative organization. From the structure shown in Figure 3-2, I have chosen several important factors that apply to NTT DoCoMo.

6.1.1 Sources of New Ideas

One of the most important sources of new business ideas is a company's hidden assets, which are difficult for new entrants to imitate. In the previous chapter, I identified the NTT DoCoMo's hidden assets as the following: number of subscribers, relationships with Japanese vendors and contents providers, channels, networking know-how through construction and operation of 2G and 3G systems, and brand. When the company identifies new businesses, it should take every opportunity capitalizes on these hidden assets.

Feedback from failure often provides useful information, and NTT DoCoMo has struggled with many failed businesses. For example, in 2001, the company started a music distribution service called “M-Stage Music,” which used the PHS system. However, the service never attracted sufficient customers because it was too expensive and the service was terminated in 2004. However, music distribution services such as Apple’s iTunes have become extremely popular through the Internet. If NTT DoCoMo makes the decision to reenter this market and offer a similar type of service, the company must learn from its past experiences.

I believe NTT DoCoMo can also learn from other leading business users. Therefore if the company aims to leverage its business segment, it needs to consider customizing or developing products by considering the example and experiences of the leading business users.

(a) Finding Resources Outside

Resources inside NTT DoCoMo are limited. Therefore the company must look for further growth ideas from sources outside the company. Venture companies and universities, both in Japan and other countries, are potential resources. NTT DoCoMo has maintained good relations with Japanese universities; it has also invested in venture capitalists, such as Gobi Partners and their digital media venture companies in China, as well as Mobile Internet Capital, Inc. in 1999. However, those investments have not been especially successful so far. NTT DoCoMo needs to find innovative businesses or technologies by using its own venture capital as well as networking with professors in foreign universities.

(b) Finding Entrepreneurs Outside

Business ideas that begin as in-house ventures often have characteristics like a small startup company. The leaders of these types of businesses have to be entrepreneurs capable of designing a good business model, finding resources, and then growing the company. In established companies like NTT DoCoMo, however, such an entrepreneur is usually hard to find. One way to find such people is from sources outside the company. Once the business is capable of expanding into a full-fledged business, the organization can be shifted from an entrepreneurial organization to a traditional organization.

(c) Encouraging In-House Ventures

In 2001, NTT DoCoMo began a program to encourage in-house ventures. Out of that program, three companies have been established so far:

- Tametan: a portal business company specializing in information for employees
- Double-Square: a planning company that provides information for working women
- Allucher: a marketing company focused on young working women and the mobile business

NTT DoCoMo has an established a program that offers incentives for people who create new business ideas, and they are encouraged to patent their ideas.

6.1.2 Hidden Liabilities

Based on my thesis research into NTT DoCoMo and my personal experience, I discovered a dilemma caused by some of the company's hidden liabilities: a bureaucratic atmosphere, an organization that is too large, long-tenure employees, and established brand. I

found that these liabilities tend to make employees conservative, sometimes even arrogant. A top-down management system or a new system for evaluating performance based on innovative results will be required in order to encourage employees to become more innovative.

6.2 PLATFORM LEADERSHIP

Platform leadership is very important for bonding customers and suppliers with NTT DoCoMo, especially after the introduction of MNP and globalization. I would like to suggest two ways for NTT DoCoMo to retain its current platform leadership and to create new platform leadership.

6.2.1 Keep current platform leadership

Currently, NTT DoCoMo manages its platform leadership by offering the i-mode platform based on Internet technologies. In the beginning, the i-mode platform included only markup languages based on cHTML. However, as the market has grown, other functions have been added, such as Java customized for i-mode and FLASH developed by Macromedia. Moreover, these functions are continually updated to enhance the functions that are offered. NTT DoCoMo has encouraged the development of new contents and services to major content provider by offering new functions as the platform leader.

In the near future, price wars will occur among new entrants. However, this will result in communication charges at low prices for customers. NTT DoCoMo needs to defend its profit by preparing efficient networks and differentiated services. The company's current platform

leadership, which encourages the development of new contents, will be a strong advantage against new entrants.

I expect that in the near future mobile handsets will offer a high-performance platform, something similar to current video game machines or personal computers, and mobile network will provide broadband capability at a fixed cost like DSL or LAN. Before these changes take place, NTT DoCoMo must do everything possible to maintain its platform leadership position by controlling both vendors and content providers, so that when the changes do occur, NTT DoCoMo is in position to take advantage of the new markets. However, ongoing expansion of the current platform must be done carefully. Applications that use an expanded platform may destroy current business models and network capacity based on limited traffic.

In addition, when 3G service becomes diffused around the world, NTT DoCoMo, based on its current i-mode alliance, should expand its platform leadership globally by joint procurement of 3G handsets.

6.2.2 Creating new platform leadership

For further growth, NTT DoCoMo needs to consider creating new areas, addition to i-mode in which it can assume platform leadership. The company is currently promoting i-mode FeliCa, the service that uses contactless IC technology developed by SONY. NTT DoCoMo founded FeliCa networks with SONY, developing and licensing the FeliCa technology, and it began to embed FeliCa chip in its i-mode handsets in 2004. The service began with an “electronic wallet” named Edy, provided by bitwallet, Inc. and has now expanded to membership cards, banks, and transportation.

The other major mobile companies, KDDI and Vodafone, announced they too would apply the FeliCa technology for their handsets as well. Therefore, NTT DoCoMo must continue to be the platform leader based on the mobile FeliCa platform.

6.3 CONCENTRATED INVESTING IN PROSPECTIVE BUSINESSES

NTT DoCoMo's current core business remains profitable, so now is not the time to make dramatic changes to the business. However, the company must begin now to prepare for the future.

One of the first steps the company should take is to reorganize its current businesses. At present, NTT DoCoMo has five main service areas: mobile phone services, PHS services, a pager service named Quickcast, a hotspot service by WiFi named Mzone, and international services. Its mobile phone services include 2G (PDC), 3G (FOMA) and packet data communication services (i-mode). In these areas, the company announced it would withdraw from the unprofitable pager services in 2004 and from PHS services in 2005.

In addition, a long-term vision is needed—although short-term plans should be flexible enough to stay current with a variety of mobile trends. In 1999, NTT DoCoMo set its future vision for 2010. Now is the time to evaluate the company's progress toward this vision. Technologies, partners, and management talent should be included in the long-term plan toward fulfilling the new vision.

As part of its long-term vision, diversification from current business should also be considered. One recommendation is a system solution for companies by using fixed mobile convergence (FMC) service. In a saturated consumer market, the company should target business areas by providing handsets for businesses combined with management or

marketing systems. I believe such services should be a combination of mobile and WiFi, so they become widely diffused and less costly for customers. By using a mobile phone as an IP phone through WiFi in both homes and offices, customers can reduce their communication costs. Despite the fact that this may result in decreased revenues for mobile companies, I believe it is necessary to pursue a strategy in order to compete with new entrants in the business segment.

Another recommendation is that NTT DoCoMo should become a global company by offering its service and products throughout the world. For instance, I suggest that NTT DoCoMo could become a platform leader by producing a standard model for 4G handsets by developing own LSI and OS, or network equipment for 4G. To increase business, NTT DoCoMo should enter into alliance with local companies, expand its branding efforts, and expand its marketing and business channels in foreign countries.

Although consideration is being given to entering the money transaction business, such as credit card or banking, by using handsets embedded with FeliCa, NTT DoCoMo should develop a strategy that considers relationships with incumbents as complementors in the current platform.

6.3 SUMMARY

In this chapter, I discussed NTT DoCoMo's useful hidden assets which can be expanded on to encourage new businesses through the company's in-house venture program, through an incentive program for patents, and through investment into VCs.

On the other hand, the company's hidden liabilities have resulted in the need for an entrepreneur who can resolve the bureaucratic structure and reduce its large size, and resolve issues involving long-tenure employees.

Regarding platform leadership, NTT DoCoMo has so far managed its i-mode platform well by establishing and maintaining good relations with content providers and handset vendors. However, if the company wishes to continue growing, it must identify and develop another platform for FeliCa.

To date, NTT DoCoMo's profit comes mainly from its mobile phone service, and it is not likely that this structure will change in the future. However, the twin threats of new entrants and a flat rate charge for service will require additional business areas into which the company can expand its business.

As part of the company's future vision, I mentioned it must consider withdrawing from unprofitable businesses, leveraging its business segment, and producing hardware in order to create new business for the future

Chapter 7

Conclusion: Keys for Growth in Japan's Mature Mobile Market

In Chapters Two and Three, I organized frameworks that can be used by a company to produce further growth in a mature market by using traditional growth models. I also presented my findings based on cases of successful, growing companies. The frameworks are: innovative organization, platform leadership and concentrated investing into prospective business. Those frameworks include key elements that should be pursued by companies that want to grow in a mature market.

In Chapter four, I analyzed the trend of the mobile industry. Using statistical data, I showed that the mobile market is still growing, especially in the countries like China, Russia, and Brazil. On the other hand, in Western Europe, Korea, and Japan, the growth rate is slowing down. Compared to Japan and Korea, Western European countries have some margin for growth because there is still a large portion of the market that does not yet use mobile internet services, while such services have grown exponentially in Japan and Korea.

In addition, my research into mobile handset vendors and alliances between mobile companies found that the relationship between handset vendors and mobile operators is becoming closer, as they seek economies of scale.

In Chapter five, I analyzed the mobile industry in Japan using Michel Porter's Five Forces model and several system dynamics models. These analyses showed that currently the

mobile industry in Japan is profitable, with medium rivalry, high entry barriers, low power of suppliers, medium power of buyers, and low availability of substitutes. There are no strong threats from incumbents so far. Moreover, a reinforcing loop of attractiveness is fueled by subsidies for retail shops, and relationships between mobile operators and vendors and contents providers. Taking all these factors into consideration, the mobile operators are pursuing good strategies at this time. However, I have also identified the probability that four threats – mobile number portability, flat rate, new entrants, and globalization – may change these present circumstances.

In Chapter Six, the frameworks and information were combined and applied to NTT DoCoMo. My analysis found that the company is on the right track for further growth. However, enhancement of its networks with universities and venture companies around the world, and cultivation of entrepreneurial and innovative human resources, will be needed if the company wishes to identify and grow new businesses.

In summary, the keys for growth in Japan's mature mobile market are:

- developing an innovative organization,
- maintaining the company's platform leadership position; and
- additional investment in further prospective businesses.

Bibliography

- Christensen, C., (1997) *The Innovator's Dilemma*, MA, Harvard Business School Press
- Christensen, C. & Raynor, M., (2003) *The Innovator's Solution*, MA, Harvard Business School Press
- Foster, R. (1999) *Innovation: The attacker's Advantage*, International Creative Management, Inc.
- Gawer, A. & Cusumano, M. (2001) *Platform Leadership*, MA, Harvard Business School Press
- Infocom Research, Inc. (2004) *Information & Communications in Japan 2004*, Tokyo, Infocom Research, Inc
- Infocom Research, Inc. (2004) *Information & Communications outlook in Japan 2004*, Tokyo, NTT Publishing Co., LTD
- Kanter, R. M., Kao, J. & Wiersema, F. (1997) *Innovation: Breakthrough Ideas at 3M, DuPont, GE, Pfizer & Rubbermaid*, Harper Business
- Moore, G. (1999) *Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers*, Harper Business
- Nomura Research Institute, Ltd. (2005) *IT Market Navigator 2005*, Tokyo, TOYO KEIZAI INC.
- Slywotzky, A & Wise, R. (2003) *How to grow when markets don't*, Warner Business Book
- Utterback, J. (1994) *Mastering the Dynamics of Innovation*, Boston, HBS Press
- Von Hippel, E. (1988) *The Source of Innovation*, NT, Oxford University Press
- Wheelwright, S. & Clark, K., (1992) *Revolutionizing Product Development*, NY, The Free Press
- Yanagihara, K. & Ookubo, T. (2004) *Sharp Corporation Stock Style Mangement*, Tokyo, DIAMOND, Inc.

Internet Sources

Apple Computer, Inc. website www.apple.com

FreeMove website www.freemovealliance.com

Gartner Inc, website www.gartner.com

International Telecommunication Union (ITU) website www.itu.int

Johnson & Johnson website www.jnj.com

KDDI CORPORATION website www.kddi.com

Ministry of Internal Affairs and Communications (MIC) website www.soumu.go.jp

NTT DoCoMo, Inc. website www.nttdocomo.co.jp

OMTP group website www.omtp.org

Sharp CORPORATION website www.sharp.co.jp

Starnap Mobile Alliance website www.starnapmobile.com

Telecommunications Carriers Association (TCA) website www.tca.or.jp

Tu-Ka Cellular Tokyo, Inc. website www.tu-ka.co.jp

Virgin website www.virgin.com

Vodafone Group website www.vodafone.com

Vodafone K. K. website www.vodafone.jp