Leverages firms use in growing paths

by

Kenji Yamanami

M.E., University of Tokyo, 1997
B.E., University of Tokyo, 1995

Submitted to the Alfred P. Sloan School of Management
in Partial Fulfillment of the Requirements for the Degree of
Master of Science in the Management of Technology
at the
Massachusetts Institute of Technology

June 2004

© 2004 Kenji Yamanami. All Rights Reserved
The author hereby grants to MIT permission to reproduce and
distribute copies of this thesis document in whole or in part for
the purpose of restoration and academic study without profit.

Signature of author

Sloan School of Management
May 7, 2004

Certified by

Starling David Hunter III
Theodore T. Miller Career Development Assistant Professor
Sloan School of Management
Thesis Supervisor

Accepted by

David Weber
Director, MOT Program
Sloan School of Management
Leverages firms use in growing paths

by

Kenji Yamanami

Submitted to the Alfred P. Sloan School of Management
on May 7, 2004
in Partial Fulfillment of the Requirements for the Degree of
Master of Science in the Management of Technology

ABSTRACT

Over 99% of enterprises in US and Japan are of small- or medium- size. Some will enjoy successful growth whereas most will suffer from poor growth, though all have started from being small. Analogy exists between those successfully growing start-ups and people who want to leverage the days spent in noted universities to a better job and to leverage the experiences in the better workplace to their further business career. Even in a world of business, it seems to be very essential in the growth of firm to leverage resources acquired.

When searched in the Google.com, ‘leverage’ hits 2,640,000 pages and ‘by leveraging’ hits 220,000 pages. Also, words of ‘leveraging’ as abundant as stars in the sky are found in speeches, presentations and brochures. Nevertheless, there are no comprehensive frameworks or papers on the corporate strategy about leveraging, though a lot of papers refer to a portion of it through, for instance, resource-based view and financial leverage. Hence, attempted in this thesis was to develop a basic framework for leveraging business strategy, Leverage Driver Model (LDM) first. LDM consists of three parts: 1) product lever, 2) reputation driver, and 3) market lever, with consideration, with the consideration of dilution with time.

Chapter 2 reviewed the past studies related to strategic leverages or related to growth paths of firms. In chapter 3, a basic mechanism of leverages in business was analyzed by introducing the Leverage Driver Model. In chapter 4, the scope of the LDM was expanded to applying itself to leveraging between products and between firms. Chapter 5 consists of case analyses on the practical leverage approaches some firms actually employed along their growing paths, and discussion was made to the attributes of leverages to the current success of some firms.

Thesis Supervisor: Starling David Hunter III
Title: Theodore T. Miller Career Development Assistant Professor, Sloan School of Management
ACKNOWLEDGEMENTS

In every phase of this study, many people supported me with many suggestions and words of encouragement. I would never be able to accomplish this task without these people. Especially, Shimano Inc. provided me a company history which was helpful to reach the deep insight of what Shimano thought of its business.

I would like to express sincere gratitude to Professor Starling David Hunter III, the thesis supervisor, who has rescued me from the situation where no other faculty members would not have dared to supervise this thesis.

I would like to thank my parents and my wife, Mari, who has patiently kept supporting me. The days I have spent at M.I.T. would have in no way been substantial and memorable without her patience and consideration.

Last but not least, I hope this thesis will make some contribution to the business world in Japan through the corporate strategy toward advancement and evolution.
# Table of Contents

1. Introduction .......................................................................................................................... 7

2. Insights into Leverage as Corporate Strategy ....................................................................... 9

3. Mechanism of Leverage in Business ....................................................................................... 9
   3.1. Introduction ..................................................................................................................... 13
   3.2. Basic Mechanism of Leverage ....................................................................................... 13
      3.2.1. Definition of Leverage .......................................................................................... 13
      3.2.2. Framework of 'Leverage Driver Model' ................................................................. 14
      3.2.3. Reputation Driver .................................................................................................. 23
      3.2.4. Other Leverage ....................................................................................................... 29
      3.2.5. Value of Leverage Drivers ..................................................................................... 30
      3.2.6. Dilutions and Pegging Effects .............................................................................. 30

4. Application of Leverage Inside and Outside Firms ................................................................. 36
   4.1. Leveraging Inside Resources .......................................................................................... 36
      4.1.1. Technology / Production Leverage ........................................................................ 36
         a) Technology / Production to 'the Original Market' .................................................... 36
         b) Technology / Production to 'Other Products / Markets' .......................................... 36
         c) Technology / Production to 'Complementary Assets' ........................................... 37
         d) Break Chicken and Egg ......................................................................................... 37
      4.1.2. Reputation Leverage ............................................................................................... 40
         e) Reputation to 'the Original Market' ......................................................................... 40
         f) Reputation to 'Other Products / Markets' ................................................................ 40
         g) Reputation to 'Other Channels' ................................................................................ 40
      4.1.3. Market Leverage ..................................................................................................... 41
         h) Accessibility to 'the Original Market' ....................................................................... 41
i) Accessibility to 'Other Products / Markets' .................................................. 41
j) Success in Small Segments of Market to 'Other Markets' .................................. 42

4.2. Leveraging Outside Resources ............................................................................. 43

1) Enhance Level of Production Lever ................................................................. 43
2) Enhance Cost Performance of Products ............................................................. 45
3) Enhance Reputation ............................................................................................ 46
4) Enhance Market Lever ....................................................................................... 47

5. Case Analysis with LDM and Key Essence of Growth ............................................. 50

5.1. Case: Keyence Corporation .............................................................................. 50
5.2. Case: Mabuchi Motor Co., Ltd. ........................................................................ 56
5.3. Case: Starbucks Corporation .......................................................................... 64
5.4. Case: Shimano Inc. ......................................................................................... 71

6. Conclusion ........................................................................................................... 82
"Give me a lever long enough and a place to stand, and I could lift the world."
Archimedes (287-212 B.C.)
1. Introduction

Over 99% of enterprises in US and Japan are small- and medium- size. While I admit the fact that some small firms prefer to be small and enjoy stable profits, I have wondered why some can grow successfully and most suffer from poor growth, though both start from being small.

I compare this issue to people’s life. Most people except those who inherit fortune and fame from the families start their lives with no fortune and fame. We need an outstanding performance based on specific ability or capability to acquire a considerable fortune post-eriori. If it is unique, it may provide a great opportunity for fortune. Not only sheer individual performance but also reputation plays a great role to enable a great chance. For example, just as graduation from a noted university like M.I.T. causes high expectation for high performance, so an experience of working for well-known firms like Mckinsey & Co. and Intel generally give us certain credibility or persuasion that attracts counterparts. To leverage brand names is one of the fast tracks to reach success. The success we have made, career records, also brings us wider options of what we can do in the future. If we successfully developed a new business with $300M profit, people expect us to perform in the same way. One success can be leveraged for future successes. As long as time to spend in business is finite, we cannot do everything from scratch. Rather, we have to leverage what we have now to seize a chance for our future success. In reality, however, an experience of being a cashier at a toll gate does not provide much opportunity for other business. To leverage our resource requires us to strategically cultivate the resource with high potential of future leverage.

Likewise, even in a world of business, I considered that leveraging resource is essential in the growth of firms. In another words, the two questions of 1) what makes us unique? and 2) which resource can we use for further expansion? should be always considered by the management. When searched in the Google.com, ‘leverage’ hits 2,640,000 pages and ‘by leveraging’ hits 220,000 pages.
Also, we can find as abundant words of ‘leveraging’ as star in speech, presentation and brochure. Notwithstanding, I cannot find any comprehensive frameworks or papers on the corporate strategy of leveraging, though a lot of papers refer to a portion of it through, for instance, resource-based view and financial leverage. Hence, in this thesis I attempt to develop a basic framework for strategic leveraging first. Then I evolve it by categorizing a variety of leverage into several types. Finally I analyze the histories of firms through the framework and discuss leverage firms use in growth paths.

As management is the flip side of strategy in that it determines the allocation of finite human resource, funds and other assets in firms, the discussion on strategic leveraging cannot be complete without the analysis of the management. In this thesis, however, I focus on the strategy side of leveraging and leave the management as a future issue I have to deepen insight into.

In chapter 2, I review the past studies related to strategic leverage or growth paths of firms. In chapter 3, I analyze a basic mechanism of leverage in business by introducing the Leverage Driver Model. In chapter 4, I enlarge the scope of the LDM applying it to leveraging between products and between firms. Chapter 5 consists of case analyses on how firms actually used leverage in their growing paths, and I discuss the attributes of leverage to the current success of firms.
2. Insights into Leverage as Corporate Strategy

Although few books and papers summarize leverage firms use in growing paths, a lot of books and papers bring insights about leverage. Porter [1] recognizes implicit significance of leverage of in-house resources insisting that a company can choose a corporate strategy by identifying the interrelationships among already existing business units, then selecting the core business that will be the foundation of the corporate strategy. Grant [2] analyzes corporate strategy from the viewpoint of company resources using his ‘Resource-based approach to strategy analysis.’ The approach starts from identifying the firm’s resource and capabilities that firms can do more efficiently than its rivals, and then appraises the rent-generating potential of resources and capabilities. Finally firms can select a strategy, but later on firms have to identify the resource gaps which need to be filled. To evaluate the rent-generating potential, he mentioned about six factors: sustainability, durability, transparency, transferability, replicability and appropriability. It shows how powerful the competitive advantage of products is and how long a firm can keep the competitive advantage, a resource to leverage to other products. In his figure of ‘Resources as the Basis for Profitability’, he shows the concrete elements of resources that will lead to profitability from the perspective of competitive advantage of companies. Roberts [3] implied the significance of leverage in light of the relationship between familiarity of a new business and a way to start it. His basic strategic questions are 1) which product-markets a corporation should enter and 2) how the company should enter these product-markets to avoid failure and maximize gain. Robert’s study revealed that the most successful firms in terms of growth had concentrated on one key technological area and introduced products related to that area, while the poorest performers had tackled with ‘unrelated’ new technologies in attempts to enter new product-market areas. In order to ensure highest performance, new business development should be constrained within areas related to a company’s base business. Roberts showed a strategy of steps firms take to reach their expansion concretely, thus establishing his own framework of ‘Familiarity Matrix.’ The matrix expresses that firms should enter a new business where it can leverage the familiarity in technology or market, otherwise it
should leverage the outside sources by joint venture or educational acquisition.

Hlavacek et al. [4] note about new joint ventures in which large and small companies join. In these efforts of ‘mutual pursuit’, the small company provides the technology, the large company provides marketing capability, and the joint venture is synergistic for both parties. It shows that both sized firms leverage their competitive resources to acquire the missing resources for the business from outside resources. I can say that without highly attractive resources, each cannot successfully have a partnership to make a joint venture. Therefore it implies that attractive resource can lever up a small firm to a stage to make a partner ship with a large firm. These brought a great improvement in executing strategies, but their foci are limited to the several alliance or acquisition approaches. Doz and Hamel [5] also refer to the leverage of outside resources. They say with the analysis of extension of networking that to ally with other firms is to acquire complementary capability or be transferred technology/knowledge. Although they analyze this issue only in light of alliance, they bring an insight of leveraging resources of other firms to your firm as well.

We can find an insight of leveraging technology in Petrov’s technology portfolio[6]. Technology Portfolio Concept includes the vertical axis of technology attractiveness and the horizontal axis of relative technological position. The process of defining the corporate portfolio of technologies is made in a highly iterative fashion analyzing ‘technology attractiveness’ and ‘business, products, and technology position.’ This portfolio facilitates the technology management and strategy development process. The concept provides a mechanism for allocating corporate technological resources and for establishing corporate technology priorities among numerous technology programs and projects. The technology portfolio reduces the number of corporate technology alternatives and makes it possible to analyze them in systematic fashion.

About the expansion of firms, many researches have tackled with the issue. Kazanjian and Drazin [7] analyzed the growth paths of small firms from the aspect of growth stages. They postulated that technology-based new ventures evolve through four discrete stages of growth: Conception and Development, Commercialization, Growth, and Stability. Gupta and Govindarajan [8] and White [9]
have studied relationships between management and strategy, and find that an appropriate ‘fit’ improves a firm’s performance. Most studies about the growths of small firms are analyzed from matching the management with their environmental factors, and brought less viewpoints of strategic actions firms took.

Cusumano and Nobeoka [10], improving the stages of expansion, explicitly mentioned about the importance of leverage. Basically their paper took an approach that focused on the coordination of multiple projects in the same period that can share critical components with each other in the automobile industry. They define typology of project strategies as four: 1) new design, 2) rapid design transfer from on-going projects to new project, 3) sequential design transfer form past project to new project, and 4) design modification from predecessor projects. They insisted that in order to increase sales, it seems useful for firms not only to develop new designs but also to leverage these new designs quickly to overlapping projects. This strategy of rapid or concurrent design transfer appears to help firms grow sales more quickly compared to the situation where, for example, firms develop a product at a time or transfer designs slowly to other products in a sequential manner. This analysis of 210 projects from the automobile industry between 1980 and 1991 indicates that firms utilizing the rapid design transfer strategy – quickly leveraging new platform components across multiple projects – increased sales more than when they or their competitors did not use this strategy. The study finally suggested that firms seem to do better if they leverage core technologies and designs across multiple product lines, while these designs are still relatively new. In other words, not only sharing technology among multiple projects but also the speed with which firms transfer new technologies across multiple projects seems to have an impact on the corporate level performance. They concluded that the leveraging technology requires some capabilities, including particular organizational structures and processes that are different from those used to manage single projects. This study is also consistent with the study of Meyer and Roberts [11] that firms that developed image-process technology leveraging core technologies to multiple new products gained more market share than firms which developed new technologies from scratch for each of their new products[11].

From the viewpoints of marketing, the significance of leveraging has been taken into consideration
in the area of marketing. Heskett, Sassar and Shlensinger [12] mentioned about the importance of referrals who can take a role of further advertisement. They categorize customer values along with the loyalty cultivated as time goes by. They define the profits form ‘Referrals’ as an increasingly significant proportion of the total value of the relationship between firms and customers. Referrals are recognized as a key driver for firms to acquire the potential customers with which firms can leverage the advertising efforts to the broader customers. Pascale et al. [13] focused on ‘Deep Indicators’ defined as 1) manufacturing cost, 2) sales per square foot of retail selling and storage space, 3) percentage of merchandise in stock at stores, 4) customer satisfaction, 5) customer loyalty, 6) customer virality. They considered deep indicators to enable employees at all levels in an organization to make knowledgeable decisions and take appropriate action without the need for close supervision. As the definition of leverage is to gain more effects with less resources, the factors they extracted bring an important insight. Hagel [14] mentioned clearly about the leveraged growth strategies. He focused on leveraging outside resources to initiate a business with less risk, categorizing the strategies into three: 1) orchestrate a process network taking a key role, 2) aggregate resources, and 3) shape an economic web. Hamel and Prahalad [15] research the leveraged strategy most consciously and ardently. They insist that leveraging resources is as important as allocating them. They compare the effect of downsizing or restructuring to the effect of leveraging resources. Their basic leverage strategies consist of the following parts: 1) accumulating resources by extracting and borrowing, 2) complementing resources by blending and balancing, 3) conserving resources by recycling, co-opting and shielding, and 4) recovering resources by expediting success. Unfortunately, these papers just categorize the leverage from inside vs outside, from the management side, or from an aspect like technology or marketing. I develop a consistent framework for leverage mentioned above in next chapter.
3. Mechanism of Leverage in business

3.1. Introduction

In chapter 2, I summarized the past academic achievements on growth strategy and strategic leverage. Notwithstanding a variety of discussions, none mentioned about overall strategic paths firms should take. The purpose of this chapter is that I analyze the basic mechanisms of leveraging in firms, and attempt to invent a model with which leverage firms use can be explained.

3.2. Basic Mechanism of Leverage

3.2.1. Definition of Leverage

In many papers, the term of ‘leverage’ is used with multi-meanings. In this thesis, I define ‘leverage’ as a lever that harvests large value with less resource. In another word, investment effect, (outcome / input) is more than 1. If firms can double outcome with the same input leveraging a technology of a product to other product, the effect is double. How to enhance investment effect leveraging resource from one to another is the leveraging strategy of growth. Leveraging resource brings firms value creations.

Resource that is leveraged is important. Given that firm A has high quality steel and firm B has poor quality steel at the same price, A’s high quality steel would be attractive to car manufacturers and they might offer A to join a new project for an advanced car. Through the new project A can accumulate state-of-art technology of steel. The difference of resource will result in the difference in the potential scope of business. However, once other firms start to provide as high quality steel as A’s, the potential scope of business would shrink, though it is still larger than B’s. Therefore, uniqueness is another capability of resource to leverage broadly.

There is a variety of leverage, not limited with leveraging high quality of product. Reputation based on a success in a small region brings the firm a chance to succeed in other areas and make the firm easy to persuade counter parts in a new business. Firms leverage equity to borrow money from banks or
markets to grow more, so called financial leverage. Berkshire Hathaway, originally a texture company, leveraged insurance deposit cash of the target company, National Indemnity, to launch an investment business. Types of leverage in business are varied, but the basic definition is always a lever that harvests large value with less resource, while weight and length of lever of leverage are different in every type of leverage. I scrutinize what can be the weight and length in each leverage and how to depict the whole picture of leverage in next section.

3.2.2. Framework of ‘Leverage Driver Model’

In physics, momentum of leverage is described as formula:

\[ \text{Momentum of lever} = (\text{Weight of A}) \times (\text{Length from fulcrum to A}) \]

Similarly, I formulate leverage in this thesis. As mentioned in previous section, every leverage has its own meaning of weight and length. Hence, I categorize basic leverage firm use (except financial leverage) in growing paths into two parts, and propose a model to depict the whole picture. The model, called Leverage Driver Model (LDM), composes of two parts connecting, ‘Product Side’ and ‘Market Side’, with the reputation driver that drives up a partial reputation to the broader one (See Figure 3-1).

![Figure 3-1: Basic Mechanism of ‘Leverage Driver Model’](image)
A. Product Lever

Basic Mechanism

‘Product Lever’ explains the mechanism that the higher cost performance of product is, and the more unique technology and production are, the larger the reputation a firm can acquire. When a firm develops a higher performance product no other firms can achieve, the firm is endowed with a fabulous reputation which leads to sales and enhances the value of the firm. On the other hand, reputation can be smaller when the product is expensive compared to its performance or when high performance never meets the requirements of consumers. Not performance but cost performance from the standpoint of consumers is a key factor to generate reputation. Thereby reputation of products can be heaved by ‘product lever’ described as a multiple of cost performance and uniqueness of technology and production.

\[ \text{Momentum of product lever} = (\text{cost performance}) \times (\text{uniqueness of technology} / \text{production}) \]

Another point that I have to mention is that product lever is relative value. Uniqueness is a relative index itself. Cost performance should also be relative. High cost performance products attracts customers, and if it is unique, the firm can realize a good sales, as many technology-oriented Japanese firms did. However, when several new entrants, for example Korea and Taiwan, with similar high cost performance products join the market and decrease the uniqueness, the original firm will decrease the market share. As a matter of course, in some case where product is quite new and market is just born, new entrants develop a market together and the original firm will grow up despite the decrease of the market share from 100%. Even in this case, consumers choose the product instead of doing alternatively other activities in the limit of time and budget. For example, game replaces playing soccer outside, and game might be replaced by internet or e-mail. Cost performance can be a relative value in terms of willingness-to-pay of consumers, and high cost performance product can replace the rival products as well as other activities that give similar pleasure or effects to consumers.

Cost Performance

Cost performance is defined from the customer side as,

\[ \text{Cost Performance} = \text{Willingness-to-pay} / \text{Price} \]

15
Willingness-to-pay reflects how much benefit a product can bring to a customer. Strictly speaking it might be different individually. To make it simple this formula considers major evaluation of consumers. Willingness-to-pay of a product can be enhanced by state-of-the-art technologies, additional functions, wider adaptability with complementary assets, and a variety of customer service. It can be improved even by customizing products into 'sweet spots' of customers' demands. As willingness-to-pay is a relative value, it can be up even by rivals that could not catch up with customers' demands or lost the fame by a corporate scandal.

Firms have to pay attention to the trade-off between increasing performance and price. Adding performance does not necessary mean the increase of cost performance according to the increase of price. I describe a general relation between cost performance and price in Figure 3-2, given that willingness-to-pay is determined by performance of product without other attributes. In general, performance will improve as firms invest, but it will gradually be saturated. Then firm can realize the maximum cost performance at some price. When performance increases by introducing state-of-art, etc., the cost performance also increases. When firms cut cost, the cost performance also increases, pushing the optimal price for the highest cost performance to lower. Thereby both of increasing performance and reducing cost shift the cost performance curve, and firms can realize the highest cost performance at a lowest price. As the price acts as a barrier for new entrants, firms can enjoy the competitive position for a longer time than in other positions.
Figure 3-2: Relation among Performance, Cost Performance and Price
Uniqueness of Technology / Production

Uniqueness of technology and production is another attribute of product lever. Uniqueness reflects how difficult other firms can catch up with and opportunity that they can enjoy the advantage of cost performance more. Technology is what firms cannot invent in a day, and many firms differentiate their products with the technology. Production represents a manufacturing know-how originated to firms. Some small factories located in Ota-ku of Tokyo have world’s best production technique and dominant market share, for example Disco has 70% share of global market of dicing saw for semiconductor. While technology itself can be leaked through patent filing, academic study, or partnership, production can be sealed within firms, because they do not need to tell the production at all and reverse engineering takes much time with less clue. Therefore production is apt to be kept uniquely for longer period. As a whole, production as well as technology is essential to differentiate the products from rivals.

I categorized the uniqueness into four levels (See Figure 3-3). In the most unique level, Level 4, firms dominate the technology and production as pioneer. We can see firms in this position, for example, pharmaceutical companies with patent filings of drugs, and Nichia Kagaku with unique blue laser technology. They established their own position where no one can reach. It is difficult to keep its position because rival firms always catch up with or alternate the technology, and the firm cannot enjoy the uniqueness for a long term. Even blue laser technology allows an advent of rivals like Toyota Gosei soon. In addition, this position can be also in the scope of Anti-trust law. The only escape that guarantees to be in the unique position is intellectual property. Niche market is not an escape but allows firms to keep the uniqueness with less new entrants for longer period. In Level 3, several firms compete with each other to dominate markets, i.e. oligopoly. In this level, firms sophisticate their technologies against each other, so a barrier for followers will go up. Till Level 2 where firms have competitive advantage to sell with, firms can make use of cost performance. In Level 1, firms are just an option for customers and there is no more strong reason for customers to buy from the firms. Firms should find another uniqueness that fits for customer needs in different quality of products.
Figure 3-3: Scale of 'Uniqueness of Technology and Production'

B. Market Lever

Basic Mechanism

It is not always true that products with high cost performance sell well. Usually we cannot know the quality of products unless we use them. The reputation, and especially the penetration of reputation, is a key driver to realize large sales. Conversely, even if the quality never deserved the good reputation, firms can still sell well with sufficient penetration of the reputation, though it is seldom sustainable due to the negative feedback of customers. The more reputation penetrates, the more likely firms are to acquire market share, thereby the penetration of reputation can be considered the weight of market lever.

While products with high reputation attract consumers, consumers sometimes compromise by buying another with lower reputation and quality when the products are not available. The availability is the easiness of access, and I define the 'accessibility' as the following three: easiness to touch (know the contents), easiness to order, and easiness to acquire. The situation that provides these three types of easiness is ideal for firms. Then I refer to the easiness of access, 'accessibility,' as the length of the market lever, and I define the momentum of market lever as a multiple of penetration of reputation and accessibility of products.

\[ \text{Momentum of market lever} = (\text{penetration of reputation}) \times (\text{accessibility of products}) \]
How large sales the market lever can realize initially depends on the market size of the products. Although the actual market size for firms can be defined by the segments firms provide products for, the potential market size can be influenced by how far the products can leverage the potentials in customer’s business. For example, flash memory was developed by Toshiba and used basically for PCs. With the advantage of portability and shakeup resistance, flash memory developed its usage in digital still camera, cell phone, USB drive, etc. The total market is determined by the markets flash memory leverages into (See Figure 3-4). Potential market will be affected even geographically. For example, the recent expansion of Starbucks into South America provides new potential market to Starbucks. In any case, potential market size on a product will be determined by how much firms can generate high levers on a product or technology and leverage the momentum to other products, markets and firms.

**Penetration of reputation**

Firms can barely handle the reputation of a product to penetrate broadly. Since sales consist of a lot of customers, the penetration of reputation is important. Even a market which has limited number of customers, for example drug in pharmaceutical industry, doctors and patients will hesitate to use the new drug without penetration of reputation is important. Not only customers can touch products in front, but also that the reputation has been reached into customers is essential. I will explain the mechanism of how to penetrate a reputation later.

**Accessibility**

I categorize the accessibility into four levels: 1) instantly accessible, 2) accessible by walk distance or sent to home or office, 3) accessible by car distance, 4) accessible by flight distance (See Figure 3-5). The factors that determine the value of each level is whether products can be touched to confirm the content of the product (touchableness), whether products can be ordered now (purchasability), and whether products can be used from now on (usability). Level 4 is the situation where all three factors are realized. For example, Expedia.com is radical in that customers can be provided the flights they exactly want to take, order tickets anywhere anytime through on-line, and use e-tickets immediately. Except the price, customers do not need to go to travel shops any longer. Harvard Business Press also
provides business cases or study papers on-line. Copy maintenance service for companies fixing within around one hour in Japan is also in level 4. The product or service for business use have limited number of customers, hence sometimes firms can provide them in level 4. While Level 4 is ideal for any industry, some products, especially tangible products which require physical movement, cannot achieve this position. For that type of products, Level 3 is ideal. ‘Last 1 mile’, a pursuit of distribution business, belongs to the level 3. Convenience stores, ebay.com and Amazon.com are in this level of market lever. Compared to the level 4, level 3 requires customers to walk to shops. Otherwise, customers order to send the purchased product to home, but it takes time. Level 3 forces customers to sacrifice at least labor or time. Level 2 shows normal stores located in the neighborhood. To compare with other stores, firms should provide some benefit like an abundant line of products with lower price like Walmart. Without high cost performance, it might be difficult to sell better. Level 1 expresses a business demanding consumers longer distance to get the product. Given the product were typical, usually customers would not dare to visit the store. To move consumers to come by flight distance, firms have to provide unique and high cost performance products otherwise customers cannot obtain.
1. LDM of Product A itself in firm X

Inside the firm X

Cost Performance of Product
Reputation of Product / Penetration of Reputation

Sales of Product

- Into US market
- Into China market

Potential market expands

2. LDMs of Applications Product A of firm X acts on

Potential market expands

Application B (Digital Still Camera)

Customer Y

Raise up the level of Technology/Production of Customer Y

Product A

Raise up the level of Technology/Production of Customer Z

Application C (Cell phone)

Customer Z

Figure 3-4: Determinants of potential market size

Accessibility

<table>
<thead>
<tr>
<th>Level 4: Instantly</th>
<th>Level 3: Walk distance / Sent</th>
<th>Level 2: Car distance</th>
<th>Level 1: Flight distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Ideal market is where customers can get anytime and try products before purchase</td>
<td>- It requires some benefit to attract customers. Otherwise firms can have only customers around firms.</td>
<td>- Without unique high cost performance, product cannot sell well.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3-5: Scale of 'Accessibility'

22
C. Abbreviated Description of ‘Leverage Driver Model’

The Leverage Driver Model (LDM) can be abbreviated to describe as below.

Figure 3-6: Abbreviated Description of LDM

3.2.3. Reputation Driver

Reputation is an important organization asset, particularly in this IT era [16]. I define the existence of ‘Reputation Driver’ between the product lever and the market lever. I assume that there is a social mechanism of reputation in addition to firms’ advertising efforts between ‘Reputation of Product’ and ‘Penetration of Reputation’ in the LDM (See Figure 3-7). A study about 230 projects carried out by 125 software firms in India demonstrated that reputation mattered in conditions of contracts [17]. Another study over the eBay reputation system reveals that the reputation on sellers increased 8.1% of selling prices [18]. When Audi Japan suffered from poor sales, the president, Jone De Nysschen, analyzed the reasons as ‘Audi cars, a high price brand, have high quality with state-of-art technology and people cannot acquire the same quality of cars as Audi for less expense. The dilemma Audi faced was that the consumers had not sufficiently recognized Audi as cars with excellent quality and capability, that is the excellent brand’ [19]. The reputation is recognized as a key driver to make a bridge between the real value of products and the sales of them to enhance the investment effect. I consider the reputation can be driven by 1) lead users, 2) word of mouth, 3) historical record, 4) customer relationship and 5) advertisement.

Lead Users
Lead users play key roles as opinion leaders [20]. Currently a variety of Web pages about consumer products are established, and lead users post the messages on the Web page. For instance, Golf-gear-review.com provides readers' reviews on golf gears. Golfers who want to buy golf gears can refer the evaluation on the clubs in advance of the purchase and confirm whether it is really what they want or not. Amazon also gives us comments from readers about how valuable the books were for them. In this IT age today, the role of lead users that they drive market penetration in the early adopters stage is getting larger.

**Word of Mouth**

I define word of mouth as the autonomy which accelerates the circulation of reputations. The more likely readers or listeners can be speakers, the faster and the more deeply information can be descended throughout. I consider two situations contributing to accelerate the word of mouth: 1) when you can get more fruit than you expected, and 2) when you know the unexpected fruit others might not know. For example, a community site about Prius, Toyota's hybrid car, posts many comments saying that Prius is much more comfortable and powerful than anticipated. Many users seemed compelled to write a comment emotionally based on 1) as well as 2). Not only on Prius but also on restaurants, sports gears, travel and the like, word of mouth works mainly through web pages and people.

Key attributes of word of mouth are lead users, web pages and credibility. Search engine is a driver to increase sales dramatically. Belluna, a mail-order service company in Japan, reorganized its internet-sales site called ‘Happy Market’ to meet the conditions with which Google.co.jp hits more in 2002. It made ‘Happy Market’ shown higher to the top in the searched result screen of Google.co.jp. Consequently, the amount of trade doubled in February, 2004. There are thirteen consulting firm helping such kind of reorganization of sites, while Google.co.jp attempts to get rid of this type of strategic web sites from the search [21]. This fact demonstrates that a search engines has an enormous power for the sales force. Credibility supports word of mouth. Before we purchase a golf club, we often check the web pages or magazine articles of actual impressions on the club. Throughout a variety of comments, we can deduce the general performance of it. A number of mouths create neutrality without any biases.
and it delivers the value of word of mouths to sellers.

**Historical Record**

Historical records on product sales give customers a motivation to buy a product. The historical records include 1) past sales record and company image, 2) experiences of users, and 3) famous customers. Past sales record includes sales, the market share, growth of sales in the past, and it appeals to customers with the credibility from the cumulative customers. It also leads to the cultivation of the company image that influences consumers’ behavior on other products. Past sales record and company image help spread over the reputation broadly. The good experiences of users are as a matter of course strong incentive for next purchase because of its subjective evaluation. As the penetration of reputation on a product costs much, it is typical that firms focus on creating repeaters with well-treated customer service. When customers have no experience related to a product, a list of famous customers on a product brings a significant impact on customers’ decision on purchase. It is not to say that all firms show their noted customers in the brochures.

**Customer Relationship**

Reputation is sensitive. When firms treat customers inadequately before purchase, the willingness-to-pay in the customers will decrease. Even a story a customer tells to the public can easily force others to create an inerasable image on the product. In reality, Toshiba experienced this type of negative impact, called Toshiba claim incident in 1999. A customer asked the customer service of Toshiba to fix a video recorder. However he was not only badly treated but also yelled at by the customer service. He appealed to the public through web pages describing the details of conversation. Finally it caused criticism and forced the VP of Toshiba to apologize to him for the bad treatment. Businesses like Ritz-Carlton and Southwest Airline who differentiate their products through customer satisfaction put high emphasis on customer relationship, and pay close attention to negative service which causes discomfort to customers. Customer relationship is a sharp driver that can easily break reputation as well as create reputation gradually.

**Advertisement**
Although reputation is generally difficult to control, firms can control it to some extent through several drivers. Brand is one of them. Brand is heavily influenced by the past reputation of the firm, because reputation building is based on the sum of all the past behaviors of the entity rather than a one-time effort [16]. Major firms like Sony have branding offices directed by secretaries of the CEOs and attempt to manage their brands. Brand names can lever up sales of products difficult to differentiate by nature. The control of brand image is essential management for firms to efficiently penetrate the value of product broadly. What drives a formation of brand image is advertisement. Advertisement is an artificial driver to promote the reputations of products or their firms. Firms in Japan spent $51.7 billion for advertisement in 2003. It explains over 1% of GDP. Advertisement expenditure aims at increasing sales by affecting the mind of consumers. By various appeals it induces them to change their subjective valuation of the product [19]. Advertisement has a role as a distributor of information about existence of the product. Firms use over 3% of sales to advertisement in cosmetics, pharmaceutical, retail and food industry in Japan. The rate of the advertisement expense over the net operating profit after tax, 228% in cosmetics and 136% in retail shows that firms in such industries cannot survive without a large amount of advertisement expense (see Figure 3-11). Hence, advertisement is regarded as a key driver for big sales in consumer-related industries.
Figure 3-7: Overview of Reputation Driver

Figure 3-8: Growth of Total Advertise Expense and GDP in Japan
Figure 3-9: Constitutes of Advertise Expense in Japan (2003) (Total $51.7B ($1=110 Yen))

Figure 3-10: Advertise Expense of Industries in Japan (2003) ($1=110 Yen)
<table>
<thead>
<tr>
<th>Industry</th>
<th>Advertise Expense / Sales (%)</th>
<th>Advertise Expense / NOPAT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cosmetics/Toiletries</td>
<td>11.0</td>
<td>227.9</td>
</tr>
<tr>
<td>Pharmaceutical</td>
<td>6.7</td>
<td>58.1</td>
</tr>
<tr>
<td>Retail</td>
<td>3.9</td>
<td>136.1</td>
</tr>
<tr>
<td>Food</td>
<td>3.4</td>
<td>99.7</td>
</tr>
<tr>
<td>Constructor</td>
<td>2.6</td>
<td>107.7</td>
</tr>
<tr>
<td>Communication</td>
<td>2.4</td>
<td>174.5</td>
</tr>
<tr>
<td>Precision Machinery</td>
<td>1.6</td>
<td>7.6</td>
</tr>
<tr>
<td>Automobile</td>
<td>1.5</td>
<td>46.3</td>
</tr>
<tr>
<td>Machinery</td>
<td>1.3</td>
<td>18.0</td>
</tr>
<tr>
<td>Electronics</td>
<td>1.0</td>
<td>219.1</td>
</tr>
<tr>
<td>Bank</td>
<td>0.8</td>
<td>7.7</td>
</tr>
<tr>
<td>Power</td>
<td>0.6</td>
<td>5.0</td>
</tr>
<tr>
<td>Insurance</td>
<td>0.2</td>
<td>6.8</td>
</tr>
</tbody>
</table>

* Average of 10 firms with highest advertisement expenses
** Aggregated with advertisement expense of leading companies 2003, Nikkei Advertisement Research Institute

Figure 3-11: Advertise Expense over Sales or NOPAT in Industries in Japan (2002FY)

3.2.4. Other leverage

**Leveraging Human Resource**

We often find the phrases of ‘leveraging human resources’ or ‘leveraging knowledge’ in presentations and brochures. These are also requisite for firms to grow. I, however, consider human being as a vehicle that carries the resource that can be leveraged. Therefore, I categorize leveraging human resources and knowledge into ‘technology lever’ or ‘market lever’ in this thesis.

**Leveraging Financially**

Although so many people use a word of ‘leveraging’ as mentioned above, they usually imagine only financial leverage when they are told about ‘leverages firms use in growing paths’. Leverage in financing are explicitly and broadly recognized as a necessary step that firms need for the growth. As abundant books describe the details of them, I will file up only the types as following [23],

1) Financial leverage (gearing) – Use of debt leveraging value of equity to increase the expected return on equity. Financial leverage is measured by the ratio of debt to debt plus equity.
2) Leveraged buyout (LBO) – Acquisition in which a) a large part of the purchase price is debt-financed leveraging the value of the firm to be acquired.

3) Operating leverage – fixed operating costs that can be leveraged to variations in profits.

4) Leveraged lease – Lease in which the lessor finances part of the cost of the asset by an issue of debt secured by the asset and the lease payments.

All are tactics that bring a larger benefit with less resource. Especially leveraging resource in the future is a leverage that might be applied to non-financial leveraging.

3.2.5. Value of Leverage Drivers

As momentum of a typical leverage expresses a multiple of weight and length of lever, so value of leverage can be explained with the momentum. However, I cannot define the monetary valuation according to the lack of metrics in willingness-to-pay and uniqueness of technology and production.

On the other hand, qualitatively we can recognize the value of leverage through the LDM mapping. When a firm finds a new usage of product or technology in other markets, it provides a new business chance for the customers. Consequently, leveraging products or technology to other markets enhances the value of product or technology with potential new markets. Through the LDM mapping, we can also comprehend which technology or production is highly leveraged, i.e. efficiently utilized.

3.2.6. Dilutions and Pegging Effects

No firm can last forever. The value of products and firms is destined to be diluted with time. I explain how the dilutions occurs, and introduce kinds of pegs that delay the dilutions in this section.

Dilution in ‘Cost Performance of Product’

Cost performance of product is relative evaluation. As time goes, rival firms usually increase the performance of their products or reduce the cost. Accordingly the relative cost performance of a leading firm tends to decrease, then it cannot enjoy the good sales any longer. I can take an example of Japanese industrial production. One of the reasons why many Japanese firms could overwhelm industrial markets
is that they made frantic efforts to realize both low costs and high qualities with accuracy. However, as firms in Korea and Taiwan joined the market with cheaper products with considerable quality, Japanese firms started to lose its steam in the market. Firms cannot sustain its relative cost performance without making continuous effort to surpass that of rivals.

Dilutions of cost performance are triggered by 1) innovative products by rivals, and 2) disruptive products in other markets that deprive the attentions of customers. 1) shows a typical competition that rivals deprive the attractiveness of the original product. For example, Windows 95 caused a fanatic phenomenon that many people jumped into the stores to buy, but it has not been at all since Windows 98 was released. To sell Windows 95 still, they had to price it down to make the cost performance of both OSs at the same level. Every product has this kind of destiny on the dilution of its value. 2) shows that a product loses a relative willingness-to-pay with the advent of alternative disruptive products in the irrelevant markets. Sloan students, once knowing the existence of $10 bus between Boston and New York, decreased the willingness-to-pay for options of flight. CD seems to have reduced the willingness-to-pay, since internet provides much fun with cheaper prices and visual effects of movies are improving with the positive introduction of 3D technologies. The acceleration of dilutions can be triggered by anything that deprives customers’ attentions from your products.

*Pegs for dilution in cost performance of product*

As cost performance is relative, we can take measures to delay the dilutions. I call the measures as pegs. Pegs are essential parts of strategies of firms that have to pay back the investment as long as possible. Among the pegs, no other stronger pegs than IP exist. Especially, cumulative production knowledge is the most difficult intellectual property to imitate because of its intangibleness. As cost performance of product increases, it requires time and scrupulous efforts like Toyota’s ‘Kaizen’ system. So far ‘Kaizen’ has been enlarged to Total Quality Management (TQM) and many firms have positively introduced it to get rid of the clots that hamper the efficiency and effectiveness in the production. Yet, rivals cannot catch up with the efficiency of Toyota, and firms in other industries even accept Toyota’s consulting on TQM. Toyota can enjoy the efficiency of the production even today. It shows that the IP
of production process contributes to pegging the dilution of cost performance. Compared to trade secrets, patents and copyrights are more easily to be diluted. As the know-how or content is obvious, firms can easily imitate the original. Then the original firms attempt to eliminate the copycats from the markets with considerate expense and judicial labors. However, the original firms cannot avoid an innovative approach that takes a cue from the original. Except technology difficult to maneuver around the original like drugs, the pegging effects of patents or copyrights are not stronger than IP of production.

**Dilution in ‘Uniqueness of Technology and Production’**

The levels of uniqueness in technology and production are also relatively evaluated. Followers in any industry always attempt to imitate the products, technology and production of leading firms. Innovation in followers compensates for the backwardness in technology making the levels of uniqueness of the leading technology or production lower. New entrants to the market also reduce the level.

*Pegs for dilution in uniqueness of technology and production*

Intellectual property and secrecy on production also take a role of pegging for dilution in uniqueness of technology and production. The peg of IP is protected under laws: patent for 20 years and copyright for 70 years (simply put). No other pegs last so long. Nonetheless many small firms choose to keep their technologies and production secret without making them rights. Especially in Japan, as technology and production in small firms are often kept as the tacit knowledge [24] in some key person, they think these knowledge will never be found or imitated unless they do not tell the arts. For other reasons, to pursue other firms based on intellectual property costs much for small firms. Until the damage by infringement of the intellectual property reaches certain scale, that small firms cannot be protected actually under intellectual property laws. In that sense, unique design might be a stronger peg for dilution in uniqueness, because people do not evaluate imitators of design much. Intellectual property including intangible know-how can be a key peg for the dilution in uniqueness of technology and production.

*Power of standardization and modularization*
Since a long time ago, many firms have fought over standardization of products, including VTR vs Beta-max and DVD-RW vs DVD-RAM. According to the LDM, to control standardization can be significant in two respects: 1) enhancing relative cost performance by decreasing the value of rivals, instead of losing cost performance, and 2) enhancing the level of uniqueness of technology / production, instead of decreasing it. About 1), people do not want to buy a product out of standard any more with fear that the complementary assets might not be available in the near future. About 2), while the rivals that lost in the standardization wars are force to catch up with the level of the standardized technology / production from scratch, the winners can enjoy the less competitive market during the period. Modularization is a strategy to acquire the standardization. Like Intel or Shimano, with a high moment lever and a high market share, a firm can lock-in other components and sell well with the high efficiency on overall system and cheaper price. Once the locked-in modularization could prevail in the market, the firm can enjoy the unique position for longer period than otherwise. Meanwhile the product lever can be maintained longer. (See Figure 3-12)

Figure 3-12: Pre- and Post- Shape of Standard War
Dilution in ‘Penetration of Reputation of Products to Customers’

While firms cannot sell well without adequate reputation, firms have to take into account that reputation is to be diluted in people’s minds, as time goes. Even if firms never make any mistake leading to lose its reputation on a product, the penetration of the product is destined to wither day by day after its peak of popularity. It is because without providing anything new firms cannot keep on occupying a portion of minds or topics in talks of customers. Sony could sell Walkman tape recorder well in late 1970s and 1980s, but now Sony cannot sell MD (Mini Disk) Walkman better than Panasonic, the leading manufacturer in Japan, just with the reputation of ‘Walkman’. The dilution of reputation on a product will hit a bottom at a level where corporate brands sustain.

In general, firms are inevitably without control over the dilutions of reputation. However, once firms establish their corporate brands based on performance and quality (though sometimes illusion), they can also delay the speed of dilutions. Titleist golf clubs, the most notable clubs in quality, are sold without considerate discount even in a long period after the release. The dilution of Titleist products is obviously less than other clubs, like Adams and Wilson. Coca Cola won a penchant to drink of many people while many of them cannot recognize Coca Cola among a group of cola products of other manufactures. The power of brand contributes greatly to keep the penetration of reputation without its significant dilution in the mind of consumers.

Impeccable customer service is also effective to peg the dilution. While customers hate even one deficit of a product, they will be loyal to products of the firms when the firms perfectly support them with sincerity after purchase. The customers even speak out the excellence of the products and firms with perfect customer service as a referral, which automatically refresh the reputation in the mind of other customers. As Hax proposes[25], total customer service is one of the targets firms should achieve. Total customer service can not only retain customers but also enhance the loyalty of customers to the firms. On the other hand, a bad reputation, especially when firms betray customers’ expectation formed by the cumulative customer relationship, also has tremendous potential to accelerate the dilution. Yukijirushi Diary, the largest diary firm in Japan, making yogurt with milk expiring ‘best before’ period,
caused food poisoning in 2002, and could not help being dismantled at last. Negative reputation drivers that lose the credibility of the firms can be fatal especially in consumer products. Once such a kind of accelerated dilution based on a bad reputation occurs with broader penetration, even if firms bring high performance products with advanced technology to markets, they could not command a good selling any longer. Many branded firms, like Nike, acknowledge this and pay close attention to the management.

Figure 3-13: Dilutions in parts of LDM

Figure 3-14: Pegs to prevent Dilutions
4. Application of Leverage Inside and Outside Firms

In chapter 3, I argued the basic leveraging mechanism in marketing a product. In this chapter, I discuss about leverage to launch other businesses inside firms and in other firms categorizing along with the resource of leverage. First I explain the leverage used inside the company as expansion of its business, then I articulate leverage to other company as product/service or resource of a variety of alliances for the further expansion of business.

4.1. Leveraging Inside Resources

4.1.1. Technology /Production Leverage (see Figure 4-1)

a) Technology/Production to ‘the Original Market’

This type of leverage is in the basic mechanism of LDM. Technology and production not only contribute to the forming of high cost performance but also support the high momentum of product lever with the uniqueness. It generates high reputation, leading to good sales. This leverage is the one firms have to maintain against dilution even after the expansion of business.

b) Technology/Production to ‘Other Products/Markets’

Core technology or production of firms is usually in the high lever. When small firms reach a certain share of the market in the initial business, they will launch the second product often with the core technologies leveraged. This is a typical leverage firms use in their growth paths. We can see many examples in high-technology industries. Shimano, the globally dominant manufacturer of bicycle parts, starts its business with free wheels for bicycles. With the high quality, Shimano has overwhelmed other rivals with the continuous advances and dominated the global market. At the same time Shimano leveraged its free wheel technology to
launch a business of fishing reels. Afterward, it also leveraged the carbon technology in its fishing rod business to golf business (see the details in chapter 5). Many firms with technology like Shimano stretch their technology out to new businesses to grow further.

c) Technology/Production to ‘Complementary Assets’

Even if a state-of-the-art technology were developed, firms are destined to suffer from poor sales if it were not for sufficient supply of complementary assets to the market. Every product has its complementary assets. Even cars need pavements to sell. Pavement is already provided enough for selling cars in US and Japan, but some state-of-art products require the arrangement of complementary assets yet. The complementary businesses are willing to launch their complementary business if the state-of-the-art products are promising. They are convinced so by the high lever of the state-of-the-art technology or production with high cost performance. Especially seeing the real product is believing. They, confirming the high product lever of the state-of-the-art products in their hands, can determine to launch the complementary assets business. It is called leverage of technology or production to complementary assets.

d) Break Chicken & Egg

When firms do not leverage the high product lever to launch the complementary assets, complementary businesses will refrain from earnest supply till the high lever product sells well. Therefore the original firms cannot initiate the high lever products into markets. I call this circulating issue as chicken and egg and chicken & Egg is one of the toughest matters in business. For example, ‘hardware diffusion first’ or ‘software diffusion first’ over a PC machine had always been argued till Dos-V prevailed. Today, fuel cell cars and hydrogen gas station form a new chicken and egg. To break chicken and egg plays a great role in a success of business. A
way to break a chicken & egg situation is to leverage high product lever to complementary assets to launch (see Figure 4-2). When the big firms with high reputation launch a new product with high cost performance, it has more chance to break chicken & egg. For example, Toyota released hydrogen cars in 2003 and currently over 10 hydrogen gas stations have already been arranged to provide hydrogen. Another way to break chicken and egg in business is that firms also launch complementary assets by themselves to show the successfulness. Nintedo’s Famicon is the case. Although Nintendo manufactured state-of-the-art game console, it also created ‘Donkey Kong’ and ‘Mario Brothers’ by themselves. The success of the two games called other game manufacturers and Nintendo could break the chicken and egg between game consoles and game software. These are the cases of powerful companies. When small firms face a chicken and egg situation, they should utilize a combination of leverage of high momentum not only in technology/production but also in reputation and market to break the situation.
Figure 4-1: Types of Technology/Production Leverage

Break Chicken & Egg

Figure 4-2: Chicken & Egg and A Way to Break
4.1.2. Reputation Leverage (See Figure 4-3)

e) Reputation to ‘the Original Market’

With few customers knowing reputation about products, firms cannot expect a large amount of selling. To impress the reputation of products on customers is a necessary mechanism to good sales.

f) Reputation to ‘Other Products/Markets’

The reputation of a product becomes a basis of the reputation of the next product. Once a firm establishes its reputation on its high capability of products, the firm can use the reputation to sell next products. Behind this scene, customers who do not know the actual performance of the next products will imagine it from the reputation on previous products as well as the next products (see Figure 4-3). It helps marketing new products till they pass the critical mass. However, once the reputation of the next product based on the customers is established, the effect of the previous reputation diminishes.

g) Reputation to ‘Other Channels’

Reputation of products is also effective when firms seek for partners, for example, in outsourcing manufacturing to hedge risks of production. In this case, without reputation OEM manufacturers may be quite reluctant to retool their production lines discarding opportunity to earn steadily with the current production. This is because business partners cannot judge whether the new products are in the high cost performance and sell better than the current product. Under such circumstances, the historical reputation of the firms can be leveraged to acquire the plausibility of success in the new business. Hence, in developing channels leveraging reputation is essential.
4.1.3. Market Leverage (See Figure 4-4)

h) Accessibility to ‘the Original Market’

When customers are interested in purchasing products, if the products are available instantly, the sales of the products become larger. Thus accessibility of products lever up a large scale of sales.

i) Accessibility to ‘Other Products/Markets’

Highly accessible distribution channel is a precious fortune that can be utilized in other business.

Victor, one of the largest audio player manufacturers in Japan, won the
standard war of video recording method with VHS methods in 1970s. At first the rival, Sony, led the market with its better quality of recording method called Betamax, and tried to involve Matsushita into the Betamax method. However, Matsushita in favor of the cheaper manufacturing of VHS chose to ally with Victor. Matsushita had 50,000 of franchise shops all over Japan and overwhelmed Betamax with them, because people were reluctant to go far to buy Betamax video recorder instead of stopping by the nearest Matsushita shops. This case shows that high accessibility of a product can be a great leverage to other products.

j) Success in Small Segments of Market to ‘Other Markets’

No firms initiate a new business on a full scale. First, they bring the products to a small segment of the market, and when they make sure that the products will sell well in the larger market, they expand its business to other segments of the market. If the reputation in the small market has expanded significantly to the other targeted segments, the firms can expect better selling. This is the leverage of success in small segments of market to other markets. This leverage also helps financing in small firms. As firms expand broadly after solid earning in a small segment, they can reduce the risk in new segments as well as utilize the earning to the new segments.

While segmentation of markets varies, basic segmentation is made geographically. For example, beverage companies in Japan launch their new beverage often in the Shizuoka prefecture, 150km far away from Tokyo and Nagoya. Scrutinizing the selling and improving the taste or design according to the feedback there, they decide whether the new beverages should be brought into Tokyo or Osaka. This is a necessary leverage for beverage firms to hedge a big loss and enhance the efficiency of investment. This type of leverage is common in a variety of industries.
4.2. Leveraging Outside Resources

As the speed of evolution of business increases, it gets more difficult for firms to catch up with the state-of-art technology utilizing only in-house R&D. Sometimes firms have to buy or be licensed with the technology, and sometimes they had better exchange their unique competitive technology with the one they want, as an alliance. With the limited resource, firms are required to establish an ideal LDM structure of business with high levers, utilizing external leverage. In this section, I analyze external leverages firms can use.

1) Enhance the Level of Technology/Production Lever

Differentiating products with a combination of distinct technologies is what most firms pursue. It is imperative for firms to timely acquire the technologies which support the high performance of products. Instead of in-house R&D, firms often purchase technology or parts from other organizations for new products partly as finished products, partly as licensing of know-how, and partly as M&A (See Figure
4-5). The choice of methods depends on uniqueness and value of the technology for the products, and strategy on resource allocation of the firms.

Haier, the second largest white goods Chinese manufacturer in the world, has realized high growth enhancing the level of technology and production with outside resources. Haier started its business in 1984, and grew up to the sales of 800M yuan (about $10B) in 2003. When Mr. Cho, the CEO, joined the company, the situation of the factory was terrible with theft by employees. He immediately shifted the manufacturing from laundry machines to refrigerators with huge prospects. He flew to Germany and made a licensing contract on the manufacturing technique and manufacturing facilities with Liebherr Inc., the powerful refrigerator manufacturer in Germany. When he watched fireworks with a German in this trip, he felt a strong sense of humiliation being told that the truly excellent fireworks are not made in China. Coming to China, he pursued quality of the products down to the ground. He broke disqualified products in front of those who made them, and every year fired 10% of employees who achieved most poorly. Consequently, four years later the sales became 75 times as much as that of the beginning. In 90s, Haier still grew with joint venture on air conditioners with Mitsubishi Heavy Industries Ltd, and on dram-type laundry machines with Merloni, an Italian manufacturer. It also purchased Tsingtao Sharp that introduced technologies from Sharp Inc. Even about designs of products, Haier established a joint venture with GK Design Group Inc., a globally evaluated Japanese design firm, and the products stand out with their attractive designs. In 1998, Haier was appointed to aim at one of the Fortune 500 companies by the Chinese government. The characteristic of Haier’s business is that it does not manufacture the key components by itself, and it took a strategy of utilizing external suppliers, even on compressors, the hearts, of refrigerators and air conditioners. Haier has focused on leveraging external technologies to enhance the quality and technology of its products. It can be realized partly because the products Haier dealt with have already had the technologies mature and the external leverage was less costly, more speedy and accessible. [26] [27]

Not only Haier but also many major firms, like Cisco and many pharmaceutical firms, took the same strategy that they leverage the outside technologies to enhance their technology level and
uniqueness. While mature technologies can easily be acquired for less cost, the state-of-art technologies requires much money to acquire, which sometimes make the deal impossible. In the competitive economy today, how to use external leverage is a key element of corporate strategy.

2) Enhance Cost Performance of Products

When it is difficult for firms to enhance the willingness-to-pay of its products with the technology or production, firms have to seek for other ways with which they can enhance cost performance. To enhance cost performance of products is a key factor for firms to realize the continuous growth.

The ways to leverage external resource to enhance cost performance of products are largely categorized into two.

(1) One is to utilize external resource to increase the willingness-to-pay of customers for products. The introduction of a new technology enhances both of the performance and the level of technology, but it is uncertain that firms can always introduce a new technology successfully. On the other hand, firms can add values to the products with unique designs. As Haier also used an attractive power of GK Design Group Inc., and many firms, like Nissan and Fuji Film, in a variety of industries use Porsche Design, design firms, if the designs fit for the minds of consumers, can bring a big impact to the increase of performance. Compared to acquiring technology, the expense of hiring design firm is limited. Sophisticating design by design firms can be a high leverage with less expense to enhance cost performance of products.

Customer service is a key issue to increase the willingness-to-pay. People in Japan who are going to buy a car will hesitate to buy a rare foreign car, because it is difficult to find a garage where the car can be fixed, in addition to the comparable possibility that it can be more easily broken. Therefore, leveraging external customer service in cooperation with garages relieves the anxiety of customers and enhances the willingness-to-pay.

Collaboration with other service is also a powerful leverage to enhance the performance of products. PepsiCo, though not having surpassed the sales of Coca Cola with any advertisements in Japan, could overwhelm Coca Cola with caps of Star Wars characters in 1999, which was
transient but epoch-making. In that collaboration brings a benefit not only to one side but also to both sides, this reciprocal leveraging is considered a effective and efficient strategy.

(2) Another is to decrease the price along with the cost reduction. Outsourcing or using foundries is a leverage to reduce the cost and enhance the cost performance. To decrease the distribution cost also makes the same effects. Previously distribution cost and accessibility of products are in trade-off, but the internet and parcel service got rid of the trade-off. Leveraging external resource to the price down is an easy and obvious way to enhance cost performance. However, we should always mind that the cost performance realized by the price cut can rapidly be diluted because of its easiness.

3) **Enhance Reputation**

As mentioned earlier, reputation drivers play a significant role of bridge between high cost performance and good sales. Some reputation is automatically percolated through uncontrollable reputation drivers, and some is intentionally created by the firms. Leverage is also important in the latter case, and categorized into three.

i. Notable people and firms can be a strong leverage. While advertisements on TV, magazine and so on are recognized as artificial images of products by customers, for example, celebrities wearing clothes a designer provides attracts wide range of people with their good image. In fashion industry, offers of cutting-edge clothes to notable people are often made. In sports industry, notable players like Michael Jordan or Tiger Woods bring a large amount of sales to the sponsors by their fantastic plays. Not only notable people but also notable firms have similar impact. For example, Siebel, a leading CRM software company, shows the list of ‘select’ customers of 181 companies in 19 industries on the last page of a product of ‘Siebel Marketing 7’. Any customers can find at least one familiar company with them in the list, and will be urged the significance of the product. Transmeta, a rival of
Intel with its less power-consumption CPU, emphasizes its achievements in its web page called 'Successes', showing a list of PC makers who introduced its CPU and the following description: 'Transmeta processors have been chosen by some of the industry's most creative companies for their longer, lighter and cooler designs'. Leveraging reputation of customers is a leverage firms can use with no expense in the industrial market.

ii. Providing information to the public is also a necessary step to leverage external speakers. For instance, responding to an offer of interview from magazines and sending out press release on a new developed technology are examples. Different from advertisement, though firms cannot control information which goes to public, firms can all the more acquire the credibility with reputation and penetrate it by just providing information.

iii. Linking a web page about the products with other web site like portal sites can be a different type of leverage. Portal site takes a great role in that customers can access the information promptly with no additional cost and at any time. While the effect of linking seems limited, leveraging links of web pages to penetration of reputation sometimes help realize a rapid penetration.

4) **Enhance Market Lever**

To enhance market lever is mandatory for firms because lack of market lever destroys the value of products at all. It, however, takes much cost to newly establish and maintain a distribution channel that has economy of scale in itself. Therefore it is wise to make the most of external leverage. From old times, wholesale business and wholesale distribution have prospered, and the advent of internet replaced a part of it. I categorize leveraging external distribution into two.

i. Wholesales and wholesale distribution is the most classic external channel firms can use to increase the accessibility of products. Shosya in Japan, such as Mitsubishi Corporation, Mitsui&Co. Ltd., and Itochu, has taken a role of
distribution channel, especially for foreign products distributed to Japanese customer. Ingram Industries in USA is the same case. Ingram Book can ship 1 million titles immediately and have a list of 4 million titles for shipping in partnerships with 15,000 publishers. Why Amazon.com chose Seattle as the headquarter is that it intended to use the market lever of the Ingram Book’s distribution channel, and the lever enabled Amazon.com to seem as if it were a bookstore with a huge stock of books. Victor could prevail its VHS method of video tape recorder through Matsushita’s franchised shops of 50,000 at peak all over the country, and overwhelmed Sony’s beta-max method. Likewise, recently convenience stores have been paid attention, as many businesses consider them a post box from which customers can pay and pick up. Leveraging a distribution to other purpose has just started yet.

ii. M&A is also a way to acquire the distribution channel immediately. M&A is more costly than just utilizing it instead, but it has a merit that firms who bought can control the market lever. A firm that has already its own distribution channel, reducing cost by acquiring rival firms, can enjoy a scale merit. When the market lever can be expected that it will be essential for many industries, M&A of the high potential lever should be done.
Utilization of Leverages Outside Firms

Type 1: Enhance the Level of Technology/Production Lever

- Purchase of technology/parts
- Licensing
- M&A etc.

Type 2: Enhance Cost Performance of Product

- Tie-up with other service
- Outsourcing manufacturing
- Design firms etc.

Type 3: Enhance Reputation

- Use of notable people and firms
- Providing information to magazine/lead users
- Liking with other web pages etc.

Type 4: Enhance Market Lever

- Utilizing distributors like Shosye, convenience stores and Ingram
- Utilizing portal site/internet mall
- Alliance/M&A etc.

Figure 4-5: Types of Utilization of Leverage Outside Firms
5. Case Analysis with LDM and Key Essence of Growth

5.1. Case: Keyence Corporation

Background

Keyence, a leader of fabless sensor manufacturer, is a Japanese blue chip firm with tremendous 46% of net income ratio to sales. It was established by Takemitsu Takizaki in 1974 to manufacture electronic control units for automation of cutting machine and frozen food production. One year prior to the foundation, he developed a non-contact sensor utilizing magnetic fields. Leveraging the sensor, Keyence developed other sensors, like high-accuracy displacement sensors and proximity sensors, necessary for factory automation (FA), and the variation of sensors strengthened the business infrastructure of Keyence.

In 1983, Keyence developed a fiber optical sensor which radically improved accuracy by its original design of circuit and it has been introduced to factories in a variety of industries, especially electronic component and home electronics industries. Keyence entered the optical technology industry. In 1986, Keyence developed a new optical sensor applying semiconductor laser. With the success, it expanded its business to applications using sensors as well as sole sensors for FA, and acquired wider customers.

Since then, Keyence has reorganized its business to the structures where it cannot be less influenced by a part of industries, keeping the sales of a customer less than 1% of the total sales of Keyence. It even refused an order from a company that would account 20% of the total sales at the time, in order to manage risk. On the other hand, Keyence proactively invested facilities and expanded abroad even in the era of slow growth after the bubble burst, establishing US branch in 1985, Germany branch in 1990, new headquarters in Osaka in 1994, Singapore branch in 1996, Malaysia branch in 1997, Thailand branch in 1998 and Taiwan branch in 1999. Even domestically, it built sales networks with 50 branch offices covering all over Japan to support direct consulting sales, a featured communication-based sales method.
of Keyence finding potential needs of customers. Consequently, in 1990, 16 years after the foundation, Keyence went to public in the Tokyo Stock Exchange 1st section and Osaka Stock Exchange 1st section, and sales and profits soared along with the stock prices: 93 billion yen of sales and profit after tax of 23 billion yen. Keyence was awarded the first place in ‘Nikkei excellent companies ranking’ in 1995 and 1996, and marked the high ranking in other years.

![Graph showing financial data from 1994 to 2002]

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Sales</td>
<td>70,920</td>
<td>65,151</td>
<td>78,820</td>
<td>101,193</td>
<td>81,982</td>
<td>93,654</td>
</tr>
<tr>
<td>Ordinary Profit</td>
<td>29,891</td>
<td>23,655</td>
<td>33,991</td>
<td>46,980</td>
<td>33,016</td>
<td>40,076</td>
</tr>
<tr>
<td>Net Profit</td>
<td>16,407</td>
<td>13,126</td>
<td>19,363</td>
<td>27,442</td>
<td>18,880</td>
<td>23,779</td>
</tr>
<tr>
<td>Total Assets</td>
<td>159,335</td>
<td>169,259</td>
<td>168,072</td>
<td>216,798</td>
<td>217,701</td>
<td>244,890</td>
</tr>
<tr>
<td>Net Assets</td>
<td>143,157</td>
<td>155,702</td>
<td>159,355</td>
<td>185,891</td>
<td>203,278</td>
<td>224,831</td>
</tr>
</tbody>
</table>

[unit: ¥ in millions]

**Figure 5-1: Financial Data of Keyence (1994fy-2002fy) (Source: www.keyence.co.jp)**

**Basic Mechanism of Leverage Strategy of Keyence**

Keyence is a firm with a mission that it provides innovative products that never exist in the markets and maximizes values added with minimum capitals and human resources. Therefore, it focuses on the planning and developing of products and adopts fabless manufacturing. Keyence has always pursued ‘world’s first, world’s smallest, and world’s best’ in its products. Through the LDM on Keyence, I
analyze the sources of its continuous rapid growth.

i) Efforts to enhance and maintain level of technology and production against dilution

First, one of the strengths of Keyence is that it pursued high momentum of product lever. As mentioned above, Keyence started its business with sensor technologies. The non-contact magnetic field sensor Keyence first merchandised solved a problem that precious press molds were often despaired in the automobile industry, and through the successful experience Keyence learned that the multi hundred thousand dollar value can be created by multi thousand dollar facilities, i.e. the significance of leveraging.

Since then, Keyence has developed innovative products realizing ‘world’s first, world’s smallest, and world’s best’, which pushed up the lever of technology to the highest. To maintain the high level on uniqueness of technology and production, it focused on planning and developing technologies. On the other hand, Keyence managed to develop new products at the faster speed keeping 30% of all products released within 2 years, keeping away from market where larger firms have been or will be in soon. By out-and-out pursuit of the state-of-art products managing time scale, Keyence is also taking measures to prevent the dilution in cost performance and uniqueness of technology and production.

ii) Efforts to maximize cost performance

Keyence also has focused on enhancing the cost performance. Cost performance in this thesis is defined as ‘Willingness-to-pay / Price’ from the standpoint of customers. Analyzing the strategies of Keyence, it has intentionally enhanced the willingness-to-pay by tuning products what customers truly want through consulting, sharing the customers’ information with the sales department. Keyence also has attempted to decrease the prices by eliminating multi-functions or additional high performance mechanism customers never demand as well as keeping it fabless with outsourcing manufacturing. These measures Keyence took consequently heaved the cost performance as well as the unmatched stable level of technology and production.
iii) Effort to keep the balance between pursuit of cost performance and uniqueness

Another thing I should mention about leveraging of Keyence is the balance. While outsourcing manufacturing to reduce costs, it holds the capability in-house to plan a new manufacturing and sophisticate it to the level where the commercial production can immediately be started. Actually it established 100% subsidiary, Querepo Inc. for highly confidential products to thoroughly compile the know-how of sensor manufacturing in a process of the development. Keyence has taken care of the trade-off between the increase of cost performance and uniqueness of technology and production in a well-balanced management.

Application of leverage and its control

The pillars of technology in Keyence are sensors and controlling systems. Starting with magnetic field sensor, then fishing for every type of sensors it expanded the variation to displacement sensors, flow volume sensors, pressure sensors, thermo sensors, image sensors, and optical sensors like fiber sensors, photo sensors, laser sensors, and proximity sensors. Since it launched an innovative optical sensor using semiconductor laser in 1986, it has initiated to create a variety of application of the two key technologies, sensors and controlling systems: gyro saucers (helicopter-like high-tech hobby) in 1989, bar code reader in 1989, digital microscope in 1990, laser marker in 1994, and so on. Figure 5-2 is a tree chart of leverage in technology displaying how efficiently Keyence has used its resources and how well the technologies have been leveraged to other products. At first sight RC helicopter seems irrelevant to the core products of Keyence, it can be operated with integration of sensors and the controlling system to keep the balance in the air. Keyence seems to have developed its markets based on its technologies rather than on the markets where it already got a share or fame. Its corporate policy ‘Realize maximum added value with minimum capital and human resources’ and ‘Key of Science’ indicate the tendency. It is also borne out by the fact that the home page of Keyence provides past solutions on industry-to-industry basis (See Figure 5-2). With the earliest experience that a small value produced a large value, Keyence operates its business to newly leverage their resources and to create new values in
its products finding the new applications as high-momentum leverage for customers.

**Management**

Keyence is a company that cherishes its human resource. First, its average annual salary of 9.72 million yen is much higher than the averaged annual salary of other similar size firms of 5.04 million yen [31], though the average age of employees is 29.8. By providing 'Performance Bonus' based on the net income to all employees, the firm aims to enhances the consciousness of employees for managing the business. To promote innovation the firm nurtures Golden Week (a week of holidays in May) refreshment holidays with 100 thousand yen. It activates the motivations of employees by placing the right persons in the right jobs in both of the in-house staff recruiting system and the voluntary notification systems, as well as by putting developers and sales persons into a team for new products. Training systems are also ample with, for example, MDP (Management Development Promotion) to cultivate the ability of leadership and CDP (Career Development Promotion) to broaden capabilities belonging in other sections for a given period. Even in terms of human relationships, Keyence make it a rule that employees call each other with ‘-san’ instead of their titles, and do not need care seating orders in meetings. It avoids anything that hampers open discussions. Keyence also focuses on cultivating and motivating employees by creating innovation efficiently and effectively at the faster speed, through salary systems with high incentives, varied training systems and its liberal working environment. With these management practices the continuous high product lever is formed and supported.

**Summary**

I analyzed the sources of high growth and high profitability of Keyence as 1) sustainable pursuit of high momentum product lever fitting for customers’ needs, 2) pursuit of leveraging sensor technologies to develop other sensors, and 3) supportive management for the leverage strategy. Especially about 2) Keyence leverages both of its core technology, sensor and controller, to go into a new market, and never initiate a new business just because it knows the market well. In its leverage strategy, all of three factors are formed in a well-balanced sustainable shape on LDM. As Keyence positions itself in niche markets, as long as it continues this type of leverage strategy, the growth of Keyence can still be expected.
Strategy 1: Enhance cost performance and level of technology/Production

- Cost Performance
- Reputation of Product / Penetration of Reputation
- Sales of Product

<Measures>
- Slogan of 'World's First, World's Smallest, World's Best'
- Faster development speed of new products (over 30% of all products released within 2 yrs)
- Enhance willingness-to-pay with feedback from 'consulting sales' by sales persons and 'customer information sheet' acquired and listed through sales activities
- Eliminate multi-functions or high performance mechanism users never request
- Avoid dilution
  - Only into markets where major manufacturers never go into (niche market)
  - Use a subsidiary, Quepo, in developing new products with high confidentiality

Strategy 2: Application of leversages and its control

Industries provided solutions with Keyence products in the home pages

- Image Sensor & Processing
  - Semiconductor, Electronics
  - Electric
  - Automobile
  - Food & Pharmaceutical
  - R&D
- Image Processing
  - Semiconductor, Electronics
  - Electric
  - Automobile & Transportation
  - Food & Pharmaceutical
  - Plastic & Rubber
- Bar code
- FA industry
- Distribution industry
- Medical industry

Management supporting Strategy 1 & 2

High emphasis on HR
- High salary (avg. ¥ 97.2 million)
- Refreshment through holidays
- Self-development through training
- Avg. age is 29.8

Corporate Policy
- Change what world should be through products
- Realize max added value with min capital and HR
- Do not listen to needs in customer (Rather actively pursue)
- Be keen on enjoying jobs
- Open work environment
- Judgment criteria are market principle & economic principle
- Action aimed at definite purpose brings achievement
- Take in change of environment earlier and improve yourselves
- Key of Science (origin of 'Keyence')

Figure 5-2: LDM Analysis of Keyence

55
5.2. Case: Mabuchi Motor Co., Ltd.

Background

Mabuchi Motor Co. Ltd. was established in 1947 when the founder, Kenichi Mabuchi, invented a world's first-ever horse-shoe shaped magnetic motor for school materials. He had a plan to apply it to toys which had a growing market. Motors at the time were made with iron core wound with coils which generates magnetic fields, but they had a deficit that power was going to exhaust soon. As the major motors then were AC motors, not taking care of the power consumption developers did not have in their minds to use other materials for the core than iron. Mabuchi used permanent magnets instead of iron core, which created a burst of applications of small motors.

In early 1950s Mabuchi Motor was on the growth path, providing its small DC motors for toys. Mabuchi took a measure to develop a new market, for example high-speed rotation motors for racing car models, as well as to cost down by standardization. Mabuchi's high-speed rotation motors, FT 16, have advantages over weight (29g vs 46g made by Pitman) and price ($1.5 vs $4 made by Pitman). In 1960s, though Mabuchi proactively expanded the applications to audio, watch, home electronics, automobile parts and so on (see Figure 5-3), 70% of Mabuchi's motors were still for toys in US and it brought a seasonal fluctuation in demands with its peak for Christmas. While rivals outsourced the orders to hedge the fluctuation risk, Mabuchi attempted to moderate it by launching hair dryer or tape recorder to avoid the dilution of technological capability. The market of DC brush motors in 1960s was dominated by Mabuchi Motor.

Through the oil shocks and market limitation of toys and home electronics in the midst of 1970s, Mabuchi Motor launched an electronic governor motor, but it suffered from the sales. With the rapid increase of PC market and high-tech home electronics market like CD players in 1990s, Mabuchi Motor increased sales steadily and is expected to grow stably from now on in its dominant DC brush motors. Since 1975, Mabuchi Motor has never performed less than 15% in its net income/sales, and had maintained high level of 25% for 5 years since 1995.

Leverage Strategy of Mabuchi Motor
It is quite rare that a firm focusing on specific products can sustain the dominant market share and high profitability for a long period. As the former CEO, Ryuichi Mabuchi, said ‘To be the top in a market is to produce most cheaply in the world’, lowest price has been a principle of the Mabuchi Motor business. It has focused only on DC brush motors, and accumulated the comprehensive know-how from R&D to product development, product design, and manufacturing to the level where no other firms could catch up with. The strategy of Mabuchi Motor is to maximize the momentum of product lever by enhancing the cost performance ultimately and high capability of product development.

To enhance the cost performance, the measures Mabuchi Motor took can be categorized into three. First, Mabuchi Motor already established factories overseas in Hong Kong in the 1960s, and shifted its manufacturing from Japan to Asia resulting in almost all production made overseas in 1990. As foundries like Micron and Solectron launched its manufacturing mature DRAM in Asia where they can enjoy the cheaper production with cheaper labor cost, accelerating with the increased economy of scale, so Mabuchi steadily swept DC the brush motors market with the cheaper prices. Mabuchi Motor is conscious of the attractiveness. When Braun, a major shaver firm, ordered a coreless motor from Mabuchi Motor as the price made by a German company was expensive, Mabuchi refused the offer and recommended to use DC brush motors because ones with the same efficiency rate can be produced for cheaper. Braun, though originally spent 1400 yen per motor, proposed 1000 yen, but Mabuchi Motor offered only 100 yen. Mabuchi Motor was never seduced to temporary profits, and sustained the competitive advantage with the cheaper price.

Second, Mabuchi Motor attempted to standardize motors decreasing the variation. It also contributed to moderate the fluctuation of demands. To lead customers to standardized motors, the sales persons seduced them with the cheaper prices. Mabuchi Motor could leverage the cheap prices of products to the much cheaper price structure.

The final point I should mention is that Mabuchi Motor focused only on DC brush motors to maintain the price advantage. If it launched other motors widely, even the cost of DC brush motors will be increased by the R&D or the initial expense till it passed the break-even points. As the market lever
was quite weak with only 80 sales persons having their hands full with the market researches, once the
momentum of cheaper prices was lost, it would have been difficult for Mabuchi Motor to sustain the high
market share.

The dominant market share with cheaper prices also obstructed the new entrants. Under the
situation where the cost performance seems optimal, even if the larger manufacturers entered, it might be
difficult to enjoy profits, as well as differentiate the merit of products. Mabuchi Motor created the world
where its business would be protected without any control including supplying power and buying power,
which can be said as an ideal position in the Porter’s five force model.

Application of leverage and its control

One of the wise decisions Mabuchi Motor made is that it expanded the applications of its products
rather than the types of motors per se. The markets of other motors were fascinating, for example 246.5
billion yen (in 1999) of DC brushless motors, shown in Figure 5-3. However, for Mabuchi Motor that
had the core competence in cheapness, new types of motors required additional R&D to keep the
competitive advantages, because the mechanism is completely different from the DC brush motors, the
core competence of Mabuchi Motor, and the large firms already entered establishing its high momentum
product lever.

Instead, Mabuchi Motor continuously developed the new applications listed in Figure 5-3. The
sales troops of 80 employees in the headquarters do the market research to search new applications and
points to improve. Mabuchi Motor expanded its business using market leverage to other markets rather
than technology leverage to other products. Why Mabuchi Motor could make such expansion is partly
because DC brush motor is basic parts in electronic machines, and as products evolves electronically, the
motors are getting more utilized while it does not require much innovation. It might be the best leverage
strategy in parts or material industries which has already gone into the mature phase.

In 1975, Mabuchi Motor, facing stagnant sales due to oil shocks and market saturation, changed its
position to enter a new market of electronic governor motors\(^1\) for tape recorders. Tape recorder was a star product after a boom of color TV sets, growing to the same amount of production as that of color TV sets. Mabuchi Motor chose its industry according to the scale and growth of the market. Governor motor has two methods: mechanical method and electronic method. Mabuchi Motor initially tried a mechanical method, but finally determined to produce the electronic method, because 1) mechanical governor motors, requiring more process in production and complex architecture despite the joints easily exhausted by frictions, did not fit for the strategy of Mabuchi Motor that pursued both of low cost and high quality through mass production, 2) mechanical governor motors needed human arts and experiences in adjusting the speed of rotation of motors, 3) the price of electronic governor motors then was at the higher level, as they were used only for high-end machines, and there was much room to reduce cost along with the price down of the electronic parts of the motors, and 4) electronic governor motors could be sold solely as well as in a pack with other motors, which gives variations in selling. On the other hand, Mabuchi Motor had not accumulated an electronic engineering enough to launch electronic motors. Consequently, the electronic governor motors showed deficits of high noise, less durability and less credibility with high percentage defective. Besides the reputation of DC brush motors of Mabuchi Motor could not leverage the reputation of electronic governor motors in electronics set manufacturers who, requiring high credibility, did not count on the reputation of a toy manufacturer. The less cost performance reduced the reputation driver all the more. Because of the less cost performance and the less reputation driver, Mabuchi Motor suffered from the business. Mabuchi Motor had to establish a powerful shape in LDM from scratch (see Figure 5-4).

Mabuchi Motor attempted to recover this situation with the special order of Sharp against the policy of selling the standardized motors. It leveraged the customer listing including Sharp to sell to other customers. Another leverage taken later was to strategically acquire Tanashin Denki, a mechanism

\(^1\) Governor motor is a motor with a device that adjusts the speed of rotation to the constant in response to the change in voltage, resistance, and temperature during playback of tape recorders.
manufacturer to supply rotation components of tape recorders to large manufacturers that produced the final product of tape recorders. With the new platform motors that got over the less credibility and durability, Mabuchi Motor’s products had been improved enough to be adopted even by large manufacturers. With the leverage of increased cost performance and the reputation driver of a famous customer, Sharp, it succeeded in acquiring orders from Tanashin Denki, which was a leverage to penetrate the motors to many final products.

Tanashin Denki and Mabuchi Motor were headed at the same purpose. As Mabuchi Motor did in its DC brush motors, it also wanted to initiate standardizations of the electronic governor motors, and Tanashin Denki could be an appropriate leverage with its top market share in the rotation components market as well as with the familiarity with the demand of the motors which Mabuchi Motor lacked. Simultaneously, Tanashin Denki could leverage not only the cost down of the motors but also the less number of the motors, to the reduction of the manufacturing cost. With the win-win situation, Mabuchi Motor, establishing the factory newly in Taiwan, could realize the cost advantage of 15% to rival manufacturers, and it accelerated the standardization and the cost reduction. Mabuchi Motor could finally skyrocket the units of the motors sold: 1.71 million in 1976, 3.06 million in 1977, 9.40 million in 1978, and 20.16 million in 1979.

The strategy for the electronic governor motors was not necessary applicable to other motors. Although Mabuchi Motor launched a motor for ASP cameras in 1996, it failed to acquire the market share. It attempted the cost performance lowering price, but the ASP camera manufacturers put more emphasis on how compact the cameras could be utilizing specific motors than on how cheap they were. The price gap between the Mabuchi Motor’s standardized motors (80 yen) and its rivals’ specific motors (120 yen), 40 yen, was trivial for the camera manufacturers that attempted to pursue the value in differentiating their products from others. In other words, higher performance created by specific motors surpassed the contribution of the lesser price to the cost performance. Mabuchi Motor could not enhance the product lever enough making a mistake to read the customers’ willingness-to-pay. Consequently, Canon with a dominant power to the market did not adopt the Mabuchi Motor’s motors finally, by which Mabuchi
Motor could not leverage the scale merit to reduce costs through enough standardization, and generate the significant reputation driver.

**Summary**

The factors which brought Mabuchi Motor successful growth can be summarized as followings: 1) Maximize the cost performance of the core product, DC brush motors, 2) With the high momentum of the product lever by maximum cost performance, it dominated the market, and 3) It expanded to the applications with the market leverage to other markets requiring DC motors rather than the technology leverage to other products requiring a part of technology in DC motors. Away from the strategy above, Mabuchi Motor went into an unfamiliar territory of motor, electronic governor motors, but actually suffered from poor sales with lower product lever and less reputation in the targeted industries which required much more accuracy in products. However, increasing the cost performance by improvement of the product, and leveraging a famous customer, Sharp, to acquire new customers including Tanashin Denki which levered up the cost performance of Mabuchi Motor’s governor motors by economy of scale, Mabuchi Motor could also make a success in the electronic governor motor business.
Mabuchi Motor

Strategy 1: Enhance cost performance and level of technology/Production

- Cost Performance of Product / Penetration of Reputation / Sales of Product

DC brush motor

Measures:
- Pursue high quality for lower price
- Standardization of products with high versatility to lower cost in unprecedented level of scalability
- Focus on its core products and enhance the cost performance to the highest level
- Avoid further dilution
  - Only into markets where major manufacturers never go into (niche market)
  - Maximize cost performance by minimizing cost, which created entrance barrier

Strategy 2: Application of levers and its control

DC brush motor

Other small motors Mabuchi Motor has never launched:
- Coreless motor
  Application: cell phone, pager (vibration)
- DC brushless motor
  Market: 246.5 b yen (1999)
  Application: PC peripheral, CD, MD
- Stepping motor
  Market: 125 b yen (1999)
  Application: FA, printer, facsimile

<table>
<thead>
<tr>
<th>Year</th>
<th>New Application</th>
<th>Year</th>
<th>New Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>1946</td>
<td>Educational material</td>
<td>1984</td>
<td>CD player, Headphone stereo</td>
</tr>
<tr>
<td>1947</td>
<td>Educational material, Model</td>
<td>1985</td>
<td>Printer</td>
</tr>
<tr>
<td>1953</td>
<td>Toy</td>
<td>1988</td>
<td>Laser disc, VTR camera</td>
</tr>
<tr>
<td>1960</td>
<td>Audio, Watch, Slide</td>
<td>1989</td>
<td>Car power window</td>
</tr>
<tr>
<td>1963</td>
<td>Car model, Home electronics</td>
<td>1990</td>
<td>DAT, Fuel pump</td>
</tr>
<tr>
<td>1966</td>
<td>Car washer pump</td>
<td>1991</td>
<td>Washer pump unit</td>
</tr>
<tr>
<td>1969</td>
<td>Small lawnmower</td>
<td>1992</td>
<td>MD</td>
</tr>
<tr>
<td>1975</td>
<td>Car mirror, Tape recorder</td>
<td>1994</td>
<td>ABS</td>
</tr>
<tr>
<td>1977</td>
<td>Camera</td>
<td>1996</td>
<td>DVD</td>
</tr>
<tr>
<td>1980</td>
<td>VTR</td>
<td>1997</td>
<td>Pager</td>
</tr>
<tr>
<td>1981</td>
<td>Mini-printer, Door lock, Drill</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table: New applications of DC brush motor

Figure 5-3: LDM Analysis of Mabuchi Motor

62
Figure 5-4: LDM Analysis of Mabuchi Motor (Cont’d)
5.3. Case: Starbucks Corporation

Background

Starbucks opened its first location in Seattle's Pike Place Market in 1971. Howard Shultz joined Starbucks as director of retail operations and marketing in 1982 when Starbucks begins providing coffee beans to fine restaurants and espresso bars. He returned to Starbucks and presented his idea to expand the whole bean retailer into a coffee bar. The Board of Directors rejected his idea and two years later, Shultz left Starbucks to start his own coffee bar company which he named Il Giornale. After two years of great success, Il Giornale purchased the Starbucks name and assets and changed the names of all of its retail outlets to Starbucks.

In 1987, Starbucks opened new coffee shops in Chicago and Vancouver, B.C., to reach 17. The annual number of Starbucks coffee shops is shown in Figure 5-5. In 1991, Starbucks became the first privately-owned US company to offer a stock option program that included part-time employees, and completed initial public offering on the NASDAQ. In 1993, it began a relationship with Barnes & Noble Inc. and opened second roasting plant in Kent, Washington. In 1995, it began serving Frappuccino blended beverages, a line of low-fat creamy, iced coffee beverages, and opened state-of-the-art roasting facility in York, Pennsylvania. In 2001, Starbucks made a commitment to the purchase of 1 million pounds of Fair Trade Certified coffee, and offered $1 million in financial support to coffee farmers. It also began to offer high-speed wireless internet access in stores. In 2001, the number of Starbucks shops in Japan reached 300. In 2002, while Starbucks signed licensing agreement with TransFair Canada to bring Fair Trade Certified coffee to more than 270 retail locations in Canada, it reinforces its dedication to coffee origin countries and the farmers who produce Starbucks coffee through an expanded line of Commitment to Origins Coffees. In 2004, Starbucks, realizing the revenue of $ 4.1 billion with its 7225 coffee shops (see Figure 5-6), opened Starbucks Coffee International in Paris.
Leverage Strategy of Starbucks

The strategy of Starbucks can be analyzed as 1) realizing a high leverage of the cost performance despite the comparative higher price than regular coffee, 2) levering up a reputation which helps quickly spreading over, 3) enhancing a market lever from one shop to another to get a dominant market share in an area, then 4) leveraging the product lever and the reputation lever to develop a new product area and a new channel of sales.

About 1), the Starbucks 1996 annual report says:

With more than 20,000 dedicated partners (employees), we are creating opportunities every day for millions of customers around the world to enjoy the Starbucks Experience. From selecting the finest Arabica beans to hiring the most talented people, we are committed to
applying the highest standards of quality in everything we do.

To realize the finest coffee beans notwithstanding the unstable harvest, Starbucks sourced about 50% from of its beans from Latin America, 35% from the Pacific Rim, and 15% from East Africa. Although Starbucks used exporters, exporters of high quality coffee were very anxious to become Starbucks suppliers because Starbucks purchased more high quality coffee than anyone else in the world. To ensure quality Starbucks also extracted three different samples of coffee from every shipment of 250 bags. At every stage of sampling, Starbucks reserved the right to reject the coffee if it was not in line with its quality standards. Roasting was also essential to Starbucks. Starbucks undertook a great deal of research by roasting its coffees in many different ways, under many different temperature and time conditions to ensure that that it was getting as much as possible from the bean. These trial and error sessions allowed Starbucks to build signature roasting curves. These roasting curves were then built into proprietary computer software. The method by which they were developed was as much as result of technology as the art. This ensured that even if a roaster were to defect to another competitor, he/she would not be able to duplicate Starbucks’ signature roasts. Starbucks even took a measure to avoid the dilution.

Second, as the fact that Starbucks is the first privately-owned US company which offered a stock option program including part-time employee shows, Starbucks pursued customer satisfaction through service as well as its high quality coffee itself. The coffee system in Starbucks was built on three principles: hospitality, production and education. Starbucks’ store employees (baristas) received a great deal of training and were able to talk about a variety of different coffees and processes. Having baristas that had a strong coffee education was essential because Starbucks’ consumers were becoming more and more knowledge about coffee. Starbucks expected baristas to be customer-service oriented by being hospitable, effective in making exactly the type of drink the customer requested and able to answer the customers’ coffee-related questions. This demand a great deal of effort on behalf of the baristas. To prepare them for the challenge, they all underwent 24 hours of training before they were allowed to serve a cup of coffee to a Starbucks customer. Every employee, even those that were hired for executive
positions, went through the same training program, which included a two-week term in a store.

About 2), Starbucks recognized the significance of leveraging its brand to develop extension in business. Of key concern in Starbucks’ marketing department was its brand equity. The retail business had historically been Starbucks’ source of brand equity. This had meant that Starbucks was never just about the coffee; it was a place, an experience. Starbucks wanted to develop its brand beyond being the preferred outlet from which to purchase coffee to becoming the preferred consumer brand. Scott Bedbury, Starbucks’ Senior Vice-President of Marketing, explained its brand:

We are transitioning from a very retail centric view about the brand to a view that will allow us to say that Starbucks’ role is to provide uplifting moments to people every day. I did not say coffee. If you go beyond coffee, you can get to music, you can get to literature, you can get to a number of different areas. It can also become a license to dilute the brand. After all we are the protectors of something that is 900 million years old. Just like when you drop a rock in a pond there will be ripples that come outside that core, Starbucks is not just a pound of coffee, but a total coffee experience.

One of the key challenges faced by Starbucks was trying concretely to define its brand image. The company executives felt that this was essential before Starbucks started mounting grand-scale national-advertising campaigns and other brand leveraging activities. Liz Sickler, Director of Special Projects (then), commented in the mid 90s:

I don’t think that we leverage our size well enough. Very often we have strong competition in local markets from Caribou, to Seattle’s Best Coffee to the Second Cup in Canada. And it’s always mind-boggling how they can be so competitive in their local markets despite the fact that our national brand image is so much stronger. We need to take advantage of our national presence. We need to compete on our brand recognition. I think that’s why we started to do some national advertisement to see if that’s how we can leverage our size. I think going into different distribution channels and leveraging the brand is the answer.

About 3), Starbucks took a great care about opening a new shop that it could use leverage of past
coffee shops. Starbucks adopted a concept of store clustering, which often placed retail outlets across from one another or on the same block. It allowed Starbucks to maximize its market share in given areas of a city and begin building a regional reputation. To meet its growth needs Starbucks had approximately 20 real estate managers across the country. These managers worked with 'street sniffs', i.e., professionals who specialized in identifying the best retail locations. Their commissions were paid either by the landlord or by Starbucks. These real estate brokers were guaranteed a minimum commission per location. If the landlord's brokerage commission did not cover the maximum, Starbucks paid the difference. With this engendered a very loyal relationship between Starbucks and the real estate network, Starbucks leveraged the external experts to enhance its accessibility of the products within an area where its brand power could reach.

About 4), Starbucks have leveraged the high-momentum product lever and the powerful reputation lever cultivated through the activities above to develop a new product area and a new channel of sales, which enhanced the leverage all the more. Figure 5-7 shows the leveraged alliance Starbucks made. For example, Starbucks' ice cream was estimated to reach $40 million at retail and contribute at least 500,000 to earnings during fiscal 1997 [35]. It opened Starbucks to an entirely new customer base, reinforced its premium quality image, and built its reputation with supermarket chains. Bottled Frappuccino was Starbucks' attempt to introduce a quality ready-to-drink coffee beverage into the North American market place. Starbucccks viewed this bottled beverage as a $1 billion opportunity. These estimates were from Pepsi, who said that it had never seen a product test quite as well as bottled Frappuccino, where 70% of testers became repeat purchasers. Bottled Frappuccino was distributed via PepsiCo's national distribution channels. Pepsi could leverage the coffee quality and reputation of Starbucks to introduce a new attractive beverage, and Starbucks could leverage the market lever of Pepsi with high accessibility to customers.

What Starbucks have to fight with will be how to fight with the dilution of the cost performance and the brand. By expanding new districts where Starbucks does not exist, Starbucks could cancel to some extent the dilution of the existing shops as the sales in Japan decreased by 20% in 2003 [36].
However, the cost performance of Starbucks is apt to dilute faster than high-technology products, because people are to be attracted by new products and rivals like Tully's and other existing coffee shops introduced special coffee and flavored coffee as Starbucks has done. Once the product lever shrinks, the brand power cannot be maintained. How to maintain the cost performance against the dilution might be a key challenge for Starbucks.

**Summary**

What brought Starbucks a successful growth can be analyzed as enhancing the cost performance first, enhancing the accessibility in the market creating the brand of Starbucks, and leveraging the competitive resources of the high product lever and the well-famed brand to penetrate into a variety of food business. The strategy Starbucks takes is, though the industry is quite different, similar to the ones many high-tech manufacturers take. However, today many other coffee shops attempted to offer high cost performance coffees like Starbucks, how to maintain the high cost performance along with consumers’ tastes and the uniqueness against the dilution, while it seeks for the further expansion of its market and the share, seems to be a key challenge for Starbucks.
**Strategy 1: Enhance cost performance and market leverage**

- Prioritizing quality coffee, selecting the finest Arabica beans and ensuring consistent quality.
- Realizing the finest roasting through trial and error and computerizing it.
- Employee training to respond to high demands from customers.
- Specialty coffee uniqueness in 1980s, now diluted with new entrants.
  - Expand business internationally before competitors get a head start.
  - Develop new flavored coffee to keep the unique positioning.
  - Concretely define brand image.
  - Store clustering using ‘street sniffs’ to maximize market share in given areas of a city and begin building a regional reputation.

**Strategy 2: Application of leverages**

- **High Quality Special Coffee**
- **New Product**
  - PepsiCo – Bottled Frappuccino
  - Dreyer’s – Ice Cream
  - Nordstrom – Special Blend
  - PriceCostco – Special Brand Name, Meridian
- **Serving**
  - United Airline – on all domestic and international flights
  - Barnes & Noble – attached locations
  - Red Hook Breweries – concentrate coffee
  - ARAMARK – the world’s leading provider of a broad range of business

Figure 5-7: LDM Analysis of Starbucks
5.4. Case: Shimano Inc.

Background

Shimano Iron Works started in 1921, amid the business slump that followed the end of the World War I. The founder, Shozaburo Shimano, worked as an apprentice at the Takagi Iron Works, one of the pioneers of Japan’s bicycle industry, and it was there that he learned the trade of lathe operator. Training machining techniques over a period of three years, he left Takagi Iron Works and hopped between several enterprises, honing and polishing his skills. At the age of 24, he was appointed foreman of Daikatsu Industrial Company in Sakai. Though Shozaburo could be extremely exacting and would scold his subordinates for the smallest technical imperfections in their work, he also built up a reputation as a capable and trustworthy foreman who took a keen interest in his workers’ welfare. When Dikatsu was shot down at the end of the World War I, he strode out on his own as an independent. He made bicycle freewheels, a component that required the greatest technical skill to produce of all the many components composing a bicycle. Shuzo declared ‘We will compete on technology’. Production of freewheels began with a monthly output target of 3,000 units, and Shozaburo set to work developing new sales channels. But production was stopped almost before it had begun. The reason was that the freewheels manufactured by Shimano Iron Works were inferior in quality to the imported articles. He devoted himself to improving the quality of the product, with a belief: ‘The key to doing business is trust. And in order to establish trust we must pursue technical excellence.’ After making improvements to the
tempering process and developing new manufacturing equipment in 1923, Shozaburo was satisfied with the quality of his freewheels. The freewheels with the finest quality available then in Japan bore the distinctive ‘3.3.3.’ brand. Despite this, he urged his employees on to an even higher level of achievement. He said, ‘Now we must thrive to make our product the best in the world.’ The uncompromising zeal for perfection was what created the reputation for superior craftsmanship enjoyed by Shimano Iron Works. The monthly freewheels had risen to 60,000 units in 1930, and 100,000 units accounting 60% of the market in Japan. In 1940s, Shozaburo Shimano became a director of the Japan Bicycle Industry Association and contributed to the establishment of professional bicycle racing in Japan.

In 1958, Shozaburo Shimano died and Shozo Shimano took over Shimano. Then demand for bicycles in Japan had reached a turning point, and the business performance of Shimano was unstable. Shimano introduced its first external gearshift system, and it proved to be a short-term hit product. Though no one could state flatly that Shimano’s business performance had fully recovered after the three years, the success of the three-speed hub had at least put the company on the path to growth once again.

During his tenure as president, Keizo Shimano who had overall responsibility for production and development undertook the important task of integrating the ideal of craftsmanship. He also worked tirelessly on the introduction of cold forging into the company’s production operations. Cold forging had the potential to provide significant cost reductions and labor savings, and for this reason many industries were keenly interested in it during the period. Keizo and his team invented a cold forging technology in 1962, making magnificent use of the massive investment, and the cold forging expertise they accumulated in the process remains one of Shimano’s most valuable assets. The technology was essential to advance into the world’s largest market for bicycle components, the United States. It was also aimed at opening up a new future for the bicycle by selling in a market that viewed bicycles not as practical tools, but as recreational accessories, which led to the mountain bike boom.

So far Shimano has also launched business on fishing reels and rods, golf club, snowboard bindings, in addition to the mountain bike. Realizing 131 billion yen of sales and 6 billion yen of profit after tax, now Shimano established its positions on the top of the bicycle industry, as to be called as ‘Intel in the
bicycle industry.'

**Leverage Strategy of Shimano**

Leverage Strategy of Shimano can be analyzed as 1) enhancing its cost performance with the high quality technology and cold forging technology that reduced the manufacturing cost, 2) bringing new high performance products into market in a timely manner, and 3) leveraging the technologies to products in other markets like fishing, golf, and snowboard.

About 1), the founder of Shimano, Shozaburo Shimano, sought for manufacturing the best quality of freewheel, with his belief that ‘the key to doing business is trust, and in order to establish trust we must pursue technical excellence.’ Accordingly, he was quite conscious of the product lever and the reputation driver then. In 1923 when more than half a century had passed since the introduction of the bicycle to Japan, domestically produced bicycle parts were no longer a rarity, but there was a clear difference between domestic and imported freewheels in terms of hardness of the steel, the most important factor determining quality. The most critical stage for the hardness of the finished product was the process of tempering or hardening. Spending day and night, they observed that the color of the steel changed gradually with change in temperature, and determined that the metal’s hardness was at the optimum point at the precise moment when the red-hot steel subtly changed hue and began to assume a shiny luster. In addition, Shimano also leveraged the high quality of imported ball bearings to enhance the quality of freewheels, changing from domestic models consumers complained about because of its low durability. Thus the quality of Shimano’s freewheels began to rise dramatically. Consequently, the export of the high quality freewheels expanded to China, Korea, India, south east Asia, Africa, and central and south America. Especially it also develop a new market share in Europe where strong competitors already exist, after the high reputation was gained on the quality of Shimano’s freewheels.

Even since then, Shimano has continuously attempted to improve the cost performance and the product lever. In 1952 when the economic downturn forced cost cutting, Shimano developed a method for forging. Originally, forging involves stamping iron plate into a round shape, heating it, and then forming it in a press. But Shozoaburo Shimano had the idea to cut the iron plate into squares of the
required weight first, heat them and then from them into rounds using a press. This was an innovation not used in other industrial sectors. It would eliminate the disposal of wasted iron plate and enable a 30% improvement in material yield. It also made the steel stronger than with the old method, resulting in better quality. This significant move would also lead to development of cold forging, a distinct technology that differentiated Shimano’s products themselves in the future. With the method, Shimano not only enhanced the cost performance through the cost down and positioned itself uniquely, but also acquired a basic technology that could leverage to a future core technology.

In 1957 Shimano started to research a cold forging technology. The innovative cold forging process enables forming of the metal with a press at room temperature. In conventional hot forging, the iron was heated before forging, which oxidized the surface. Thus a cutting process was necessary to meet dimensions by removing the oxidized surface. Cold forging either eliminates this process or requires it only to a slight extent, which results in major costs savings. Cold forging is also faster, since it is not necessary to heat the iron before forming, so it supports mass production. Moreover, the material left over from making larger parts can be used to make smaller parts. Accuracy of the products is improved, and a vast amount of processing can be performed in one mold, enabling uniform accuracy. The new technology was far superior to hot forming. In addition, Shimano automated the cold forging process for the first time in all industries. The material weight of the three-speed hub made with hot forging was 685 grams; with the new process it reduced to 400 grams. Cold forging also made it possible to reduce total work processes by about 30%. Then Shimano also changed a policy of outside procurements to a policy of in-house production of those parts that required high expertise, and procurement of other parts from companies that had the technical capability to manufacture them.

The last thing I have to mention about the cost performance is service center established in 1958. Up to this point, there had been very little awareness of marketing in the bicycle industry. Manufacturers held the deep-rooted belief that all they had to do was make good products, i.e. selling was the job of the outlets. In particular, a manufacturer of bicycle parts had almost no sense of product promotion. Retail shops could rely on their own experience to handle products they knew a lot about,
such as freewheels. However, the three-speed hub was a type of product dealers were seeing for the first time. Shimano thought the current levels of technical and service guidance were insufficient to provide satisfactory customer service, and perhaps also enhance the customers’ willingness to pay.

Through the years, Shimano established the corporate structure that sustained the high cost performance and its uniqueness with the high quality products, service center and original production methods that also realized the cost reduction as well. The pursuit for the new technology and production also prevented Shimano from its technology being diluted.

About 2), Shimano launched new products timely spearheading the bicycle market. I can mention about three-speed hub, system component and mountain bikes. In 1958 Shimano developed a three-speed hub, a hub axis of a rear wheel for gearing. As the internal gear changer itself would be in large demand in the future, Shimano decided to develop one from scratch to meet Japanese needs. Keizo Shimano, who was in charge of the project, had long felt that Shimano was still causing hardships for the user, and that alleviating such obstacles would increase sales. He approached a project to improve the willingness-to-pay. The new three-speed hub made the pedaling easier than with the previous hub. There was no wasted pedaling and the part itself was cheap. Shimano applied for both Japanese and American patents, and launched sales under the slogan, ‘The world’s smallest three-speed hub.’ It was a savior for Shimano, which had been striving for financial recovery. Earnings soared, as sales for the full year of 1960 rose more than 40% than that for the previous year. With the product, Shimano established its unique position in technology and production, as well as the high cost performance of a three-speed hub product.

In 1975, the principle of developing system components, which is today a basic policy in the industry, came out. Shozo Shimano, the president, believed that a bicycle had to be more than the sum of its parts and that its components had to be designed to work together. Development focused on the functioning of components working together, rather than functional improvements made to individual parts, such as hubs or external shifters. To vastly improve the functioning of parts it was essential to treat them as integrated components. Many products were created in this process built around the
principle of system components. In 1978, Shimano began selling both the Dura-Ace Ex and Shimano 600 EX series, promoting these worldwide as a new departure for components. The two products were highly regarded for the superb cost performance ratio. The two groups integrated 13 new mechanisms, not just drivetrain and brake systems, but entirely new functionality for the handlebars and set posts. In 1984, Shimano marketed the new Dura-Ace series with Simano Index System (SIS). SIS is an epoch-making innovation that realized that it released riders who concentrate on racing from troublesome shifting operations. In the world of competitive road racing, athletes riding SIS-equipped bikes increased and competing manufacturers also began introducing similar systems. Index shifting soon became the standard everywhere. Owing to the fame and its requirement of integration of the principle of system components, Shimano could come to control the de facto standard of bicycle parts.

Shimano took a role to spearhead mountain bikes to the boom. Mountain bikes were born in 1976 and steadily caught on. However the battering bumps and jumps on the trails and unpaved roads took a heavy toll on the bikes, which were always breaking down. Shimano launched a full study into this new phenomenon. None of the major bicycle manufacturers at the time had yet built a mountain bike. Shimano released a component, New Deore XT, that the function of New Dura-Ace series was applied to. It was a response to the tough engineering challenges of designing for riding in mud and dirt, but it became a huge hit helping sending this bike craze spiralling upwards. It also got rid of a rival promoting another type of gear components for called ACCUSHIFT by dominating the mountain bike market which required advanced technology. With the huge sales, Shimano could jump the sales from 51 billion yen to 168 billion yen. Shimano, by spearheading a new product, initiated it in a position where Shimano could enjoy the uniqueness as well as the high cost performance leveraged from the current technology and production on other products. Once new entrants joined the market, Shimano would have difficulty to reach the same high product lever, because product lever is a comparable momentum to bolster the reputation and the sales, and the earlier entrants with less technology originally would have accumulated so far. Shimano also modularized its parts, categorizing them by price and quality. Then it packaged the parts, for example, the index shifting designed to be most efficient with Shimano’s shift lever, rear
cogs, chain and so on. In addition, Shimano gave 10% discount for volume-purchasing. Consequently, it forced bicycle assemblers to procure the parts from Shimano. This is why Shimano is called as ‘Intel in the bicycle industry.’ According to the LDM, it contributed to Shimano maintaining unique position avoiding dilution. In conclusion, the three measures brought Shimano a great success: 1) a high powered lever in technology and production of mountain bike components, 2) a fast move to new seeds of business, like mountain bikes, before the comparative product lever would be diluted by earlier entrants, and 3) modularization that locked-in the purchase of other parts as well as avoided the dilution of uniqueness.

About 3), looking for new source of growth, Shimano has leveraged the technologies to products in other markets like fishing, golf, and snowboard. To look at the products of fishing reels and snowboard bidding, it is obvious that Shimano searched new markets where Shimano can realize the comparably higher cost performance.

From 1970s onward Shimano became involved in the manufacture and sale of fishing tackle. The fishing tackle business was selected because it the technology and material Shimano cultivated in the bicycle business could be leveraged and it is an outdoor sports that contributes to the health of people. Spinning reels are products that can be easily leveraged from the bicycle technology, but rods require other technology about material. Shimano purchased Tosaku Tsurigu, a bankrupted fishing tackle firm, which had licensing of graphite fiber rods. However, the licensing is not appropriate, so Shimano was forced to sell fishing tackle that was painted on a rod Shimano purchased from other manufactures. Shimano had suffered from the poor sales for the first ten years because it had to compete in an industry with hundreds of small- and medium-sized manufacturers jockeying for position, without an established sales route. The LDM displays the situation as the worst, because Shimano’s fishing tackle business had 1) low product lever with no original technology and average cost performance, 2) low reputation drivers in fishing tackle, and 3) low market driver with less accessibility because of less reputation.

Shimano started to establish its own sales companies in each district, like Kanato and Kyusyu, and directed the allied detail shops. Shimano got a feedback of customers’ opinions from the distribution
channels to improve the product and enhance the willingness-to-pay. Shimano strengthened the market distribution and leveraged the channel to enhance the cost performance. The increased product lever contributed to the global reputation of ‘Bantam’ reel on its high quality and functionality in 1978. Today the fishing division has grown to account 30% of total sales of Shimano.

Shimano initiated to sell a bidding system for snowboard in 1998. It has origin when K2, one of the top skiing and snowboarding equipment manufacturers, approached Shimano to apply the Simano Pedaling Dynamics (SPD) of bicycles to snowboard bindings. SPD had a competitive advantage on the efficient transfer of power from feet to bicycle or snowboards, and easy release. Shimano started to develop step-in bindings for snowboarding in cooperation of K2, and sell them with the brand name of K2 through the K2 sales channel. Soon the binding got popular and the reputation has got higher year by year. Shimano could leverage the in-house high technology of a bicycle product directly to snowboard binding. Shimano not only leveraged the know-how of K2 about snowboarding to satisfy the requirements of customers, but also leveraged the distribution channel to enhance its accessibility. Moreover Shimano leveraged the reputation of K2 to increase the penetration of reputation. Hence, different from the fishing tackle business, Shimano succeeded in launching the snowboard binding business in an ideal situation on the LDM with high product lever, high market lever and high reputation driver leveraging the name and know-how of K2 and its unique SPD technology of bicycle.

Summary

The founder of Shimano, Shozaburo Shimano, thoroughly focused on high quality product introducing new manufacturing method like cold forging to reduce the cost. Consequently Shimano could realize the high product lever and maintained it by inventing new products and new production ways. Then Shimano leveraged its products to new products of fishing tackles and snowboards. In the fishing tackles business, Shimano at first had the low product lever purchasing the rod from other firms, and the low market lever. It established its own distribution channel and leveraging opinions of customers gained through the channel to improve the cost performance, then it realized the high product lever, the high reputation driver, the high market lever. In the snowboard binding business, Shimano
leveraged its technology of bicycle, SPD and the know-how of K2, directly to realize the high product lever, then it sold the bindings with the brand name of K2 and used K2’s distribution channels with high market lever. Shimano got a reputation and could penetrate its binding systems into the market.
Strategy 1: Enhance cost performance and level of technology/Production

- Develop high quality freewheels in pursuit of hardness
- Cost down by changing cut shapes of iron for forging to reduce the wasted iron
- Cost down by inventing cold forging to reduce cost while enhancing quality
- Cost down by automating the cold forging
- Avoid dilution
  - Spearheading new production and technology
  - Use an outsourcing, to make a product requiring expertise inside

Strategy 2: Application of leverages

<Fishing tackle>

- Thought bicycle hub to be leveraged to reels
- However, with purchased rods cost performance of Shimano fishing tackle was not outstanding
- Not having its own distribution channel
- Develop its own distribution channel
- Invent high cost performance products with feedback from customers through its distribution channel
- Reputation has gradually been established with new high cost performance products

<Snowboard binding>

- Leverage the technology of bicycle in Shimano completely to snowboard bindings
- Leverage the K2 brand to acquire the reputation by offering OEM to K2
- Leverage K2's distribution channel to reach consumers

Figure 5-9: LDM Analysis of Shimano
Figure 5-10: Sales of Shimano: from 1970 to 2000
6. Conclusion

I developed the Leverage Driver Model (LDM) through consideration of the reputation driver and dilution of momentums. The LDM consists of three parts: 1) product lever, 2) reputation driver, and 3) market lever. The product lever is a lever with a momentum of cost performance for consumers (willingness to pay / price) multiplied by uniqueness of technology and production. The lever enhances reputation of the product. To sell well, reputation of the product should be penetrated into customers broadly. It can be made through reputation drivers mostly outside the firm's control, like articles in magazines and word of mouth, and partly inserted by the firms' control like advertisement. Not only penetration of reputation but also close accessibility of the product to the market is important to command a good selling. The momentum of market lever can be expressed as a multiple of penetration of reputation with accessibility of the product. All values of product lever, reputation drivers, and market lever are relative to not only other rival products but also any substitutes in other industries that brings disruptiveness to the values. According to the LDM, when all of product lever, reputation drivers, and market lever are high, the product can sell most.

The LDM is also used for analyzing how well firms use resources inside and outside the firms. Firms should maintain the ideal situation of high product and market lever and high reputation on core products against dilutions, and create the ideal situation on new products by leveraging of inner resources as well as leveraging outside resources. Firms that have high product lever have opportunity to leverage other products inside and outside the firms. In expansion process of firms, the advantage that they have high lever in product or market or high reputation, like famous brand, is essential.

I analyzed four firms - Keyenece, Mabuchi Motor, Starbucks, and Shimano - through the LDM, and extracted the following common factors that make a successful growth.

1) Pursue to enhance and maintain high product lever

High product lever is basic to growth, because without it firms cannot have reputation of
products and thereby are not able to sell well in a competitive market. All four firms had thoroughly pursued the high quality or performance of product until it became outstanding. After reaching a high lever, they still kept on increasing the cost performance by decreasing cost introducing new production or outsourcing, and by adding service customers demanded based on feedback from the sales forces. High product lever can always be a backbone of the firms.

2) Leverage market to market by themselves and leverage product to product in cooperation with others

They developed new markets with high reputation in a market. For example, Shimano, after getting enough reputation in Japan and globally, initiated the export of its freewheels to east Asia, Europe and other markets. This is because the reputation driver in a market worked as well in other markets. It fits well for industrial products, while consumer goods, especially foods, require fits for the new markets. Looking back to the start point of Starbucks in Japan, there was no established reputation because no one knew Starbucks then. It cultivated the reputation with its high product lever that is unique special coffee fit for the taste of Japanese with no competitors providing the same type of coffee. However, once customers knew the taste with experience or word of mouth, Starbucks could leverage area to area. In general firms that have high product lever and enough cash to expand markets are apt to leverage market to market by themselves. On the other hand, even firms with high product lever cooperate to launch a new product. This can be because new products have other critical requirement in technology and the firms need to leverage outside resources to satisfy the requirements. As a whole, it can be the case that firms cannot create a product with high lever without leveraging outside resource under the situation where the time to enter the product is limited.

3) Keep focusing on establishing high product lever, high reputation drivers, and high market lever

The cases I analyzed, for example a fishing business of Shimano, show that firms cannot
sell well when they lack any one of high product lever, high reputation drivers, and high market lever. Firms have to consider the resource allocation not only about financing but also human resources to enhance the levers and drivers of the existing business and new business highly. As the resources of the firms are limited, how much they can leverage outside resources with less inside resources can be one of key points for the strategies.

As further research, I recommend that 1) LDM should be applied to a variety of industries, 2) existing frameworks for corporate strategy should be analyzed through LDM, and 3) the change in the LDM mapping of firms should be analyzed in a chronological order.

I hope that all those who use the LDM can successfully educate their firms to further sustainable success against the dilution of their business.
References

[26] Joukan F., Haier was a paper tiger, Bungeisyunju, April 2004, p208-p214.
[28] http://www.fandi.co.jp/monthly/m_backnumber/m_nami_jan04.b_number.html
[37] Shimano, Pursuit of Dream, 80th anniversary.