

Genentech Inc. Case Study:

IMPLEMENTATION OF TECHNOLOGY MANAGEMENT

by:

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“FUNtastic Enthusiasms to you”

1. Introduction

Technology is a key resource of profound importance for corporate profitability and growth. It also has enormous significance for the well-being of national economies as well as international competitiveness. Effective management of technology links engineering, science, and management disciplines to address the issues involved in the planning, development, and implementation of technological capabilities to shape and accomplish the strategic and operational objectives of an organisation.¹

The concept of technology management is quite broad, since it covers not only R&D but also the management of product and process technologies. Viewed from that perspective, the management of technology is actually the practice of integrating technology strategy with business strategy in the company.

In this article, it provides the implementation of technology management using Genentech Inc. as a case study. It also covers a particular issues imposed on the major strategic options facing the company, provides a Mission Statement for the company and other issues related to the its strategy.

Company Overview

Genentech, Inc. was founded in 1976 by venture capitalist Robert A. Swanson and biochemist Dr. Herbert W. Boyer. In the early 1970s, Boyer and geneticist Stanley Cohen pioneered a new scientific field called recombinant DNA technology. Excited by the breakthrough, Swanson placed a call to Boyer and requested meeting. Boyer agreed to give the young entrepreneur ten minutes of his time. Swanson's enthusiasm for the technology and his faith in its commercial viability was contagious and the meeting extended from ten minutes to three hours – by its conclusion, Genentech was born.

Genentech claims a the first company to commercialize the recombinant DNA technology and sets its plan to build a major profitable corporation by manufacturing and marketing needed products that benefit mankind. It focuses on the research and development to design microorganisms that will synthesize products for which there is a large existing market and where economies of production will lead company to

¹ Betz, Frederick. *Strategic Technology Management*, McGraw-Hill, Inc., 1993.

competitive advantage. Genentech convinced that the future uses of genetic engineering are far reaching and many. Microorganisms could be engineered to produce protein to meet world food needs or to produce antibodies to fight viral in viral infections.

2. Major Strategic Options

New business development may address new markets, new products, or both. Typically, such new businesses are initiated with low market share in high growth markets and require large cash inflows to finance growth². Genentech had a same typical situation where it had low share market in high growth markets. Its specialization focuses on the genetic technologies – DNA recombination – required high cost to develop the technology.

Entering a new business or a new product market may be achieved by a variety of mechanisms, such as internal development, acquisition, joint ventures and minority investments of venture capital. These mechanisms make different demands upon the corporation.

New business development may address new markets, new products, or both. In addition, these new areas may be ones that are familiar or unfamiliar to a company. This technique can be implemented on the Genentech to determine major strategic options facing the company.

The application of this technique is located conceptually on a 3 X 3 technology matrix as illustrated in Figure 1, Appendix. The nine sectors of this matrix may be grouped into three regions, with the three sectors that compromise any one region possessing broadly similar levels of familiarity.

Genentech has developed its products using recombinant DNA technology which can be classified into a new technology. Recombinant DNA technology has been invented by Genentech's founder, Dr. Herb Boyer, and Dr. Stanley Cohen in 1973. It also can be classified into unfamiliar technology due to Genentech is the first company using this new technology which was pure new technology in the pharmaceutical field.

² Roberts, Edward B. and Charles A. Berry, "Entering New Businesses: Selecting Strategies for Success", *Sloan Management Review*, Spring 1985, pp 3-17.

The market of genentech's products also can be classified into a new market, for instance, Genentech develop and manufacture human insulin which had never existed before in the market place. Genentech also had got patent for most its products due to it develops new products and technologies. The main features of its new products in the market place relate or replace existing product markets. Here, human insulin also can be taken as an example. Human insulin has been successfully produced as a chemical structure exactly like the natural insulin occurring within human body. These products related to the previous technology of insulin, such as bovine and porcine insulin. To sum up, Genentech market can be classified into new familiar market.

Yet, Genentech can be classified into new unfamiliar technology and new familiar market in the familiarity matrix. Several strategic options could be taken by Genentech, such as venture capital and educational acquisitions.

2.1. Venture Capital

The venture strategy that permits some degree of entry, but the lowest level of required corporate commitment, is that associated with external venture capital investment³. Genentech could implement this option in order to become involved with the growth and development other companies as inventors, participants, or even eventual acquires. Furthermore this option could lead the company to providing window on new technology and market.

2.2. Educational Acquisitions

In educational acquisitions, the acquiring firm immediately obtains people familiar with the new business area, whereas in a minority investment, the parent relies upon its existing staff to build familiarity by interacting with the investee.⁴ Genentech could adopt this option to enter the biotechnological competition, it required internal skills and

³ Ibid.

⁴ ibid.

knowledge through acquisition within an existing biotechnological company, for instance, Eli Lilly or Roche.

3. Develop a Mission Statement

Before mission statement has been developed, the vision has to be developed first because the vision describe the purpose of organisation and the mission statement describe how all organizational aspects contribute to the achievement of the vision. An organisation's objectives, strategies, and performace measures should then flow from the vision and mission, as shown in the figure.

Genentech, as a company powered by recombinant DNA technology, tries to achieve to be the leader in the biotechnology field. It focuses on developing innovated product of pharmaceuticals to serve the mankind while working to provide growth and return to investors.

Vision Statement

To commercialise recombinant DNA technology effectively for the benefit of mankind while working to provide enviable growth and return to investors.

Whereas the vision is a succinct statement, the mission statement is necessarily longer to convey the business principles. The mission statement should answer the following questions:

- What business are we in?
- What will the business do?
- Who for, and why?
- What sets this business apart from others?

(National Print Industry Association 1993)

Those four basic questions will lead the company to identify where the position of the company wants to be and to determine where the company position is. The statement gives the important information on how to get there. These questions have been assessed to the Genentech.

Genentech Inc.

1. What business is Genentech in?

Biotechnology industry, using recombinant DNA as a base of technology.

2. What will the business do?

Develop, manufacture and distribute pharmaceuticals that address significant unmet medical needs.

3. Who for and why?

Patients, and medical profession. It also commits to seeking significant returns to the stakeholders.

4. What sets the business apart from the others?

High standard of integrity and excellent science.

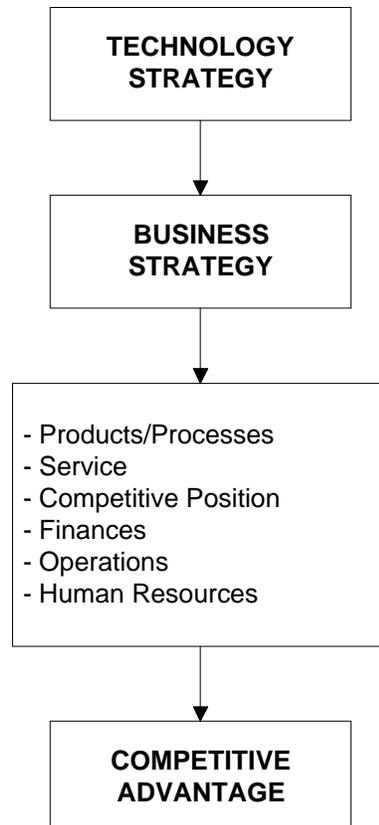
The mission statement has been developed base on the four basic questions:

Mission Statement

Our mission is to be the leading biotechnology company, using recombinant DNA to develop, manufacture and distribute pharmaceuticals that address significant unmet medical needs. We commit ourselves to high standards of integrity in contributing to the best interests of patients, the medical profession, and our employees, and to seeking significant returns to stakeholders based on the continued pursuit of excellent science.

4. Strategy Choice

Technology strategy can be defined as an understanding within the firm of the importance and potential of technology for its competitive position, how in the future that potential is to be realised, and how this complements the other aspects of strategy, such as finance, marketing and personnel. Technology should be regarded as one of many



elements of a firm's overall business strategy, with technology management setting, measuring and achieving technology objectives to support and shape the firm's business strategy.⁵ This concept is presented in figure below.

Figure 1: Supporting and Shaping Business Strategy by Technology Strategy

Source: Walker, John, Module 1: EM 551 Strategic Technology Management, 1998.

Before determining the strategy which is suitable to the company in the current situation, the situation analysis can be taken in order to assess the potential environment may influence to the company's development. In term of assessing the situation analysis, there are two major factors can be examined, external and internal factors. Market definition, environmental analysis, and competitor analysis can be assessed as external factors contributing to the Genentech situation. Internal factor assesses the capabilities or resources that the company has to capture and hold the market.

External analysis

In term of market definition, Genentech had low market share as initial, it has been predicted as high growth markets. Genentech focuses on the specific areas in the market which concentrate to capture pharmaceutical-product's market.

The environmental situation facing the Genetech situation is imposed by the rising in several new disease. Furthermore, there are still a lot of disease which don't have the right medicine. The market of genetic product is predicted increase in the high demand. The technology and science in DNA recombination are rapidly change toward the high-medicine technology.

Internal Analysis

Genentech had produced human insulin by recombinant DNA technology. The human insulin can change the animal insulin role in the medical field. Because, it was designed as a chemical structure exactly like the insulin naturally occurring within the human body. Human insulin was not expected to cause allergic reactions in certain individuals.

Genentech requires high cost of R&D for developing its product and science. Genentech has own laboratory and R&D centres for gaining new science and product. Innovative science is basis of existence of the company and the foundation of the future.

Genentech has proposed its new pharmaceutical product to get patent. Through the protection of a patent, those who take the financial risk of developing a medicine are assured that they will have an opportunity to recoup their investment in the market place. Genentech is also responsible for the technology behind five other approved products:

⁵ Walker, John, *Module 1: EM 551 Strategic Technology Management*, 1998.

human insulin, interferon alpha, factor VIII, bovine growth hormone and hepatitis B vaccine. Genentech receives royalties from the sales of these products.

Genentech has built strong pipeline in order to achieve targeted demand of the market. Its development pipeline builds in the company’s core competencies in its three areas of strategic focus: cardiovascular medicine, endocrinology and oncology.

To sum up, there are three major elements contributing to the internal factors: science, products and strong development pipeline.

Furthermore, the SWOT analysis can be used as a tool to analyse the internal resources of the enterprise and the external environment in which it operates. Figure 2 shows some of the sources of internal and external influences on the activities of company.

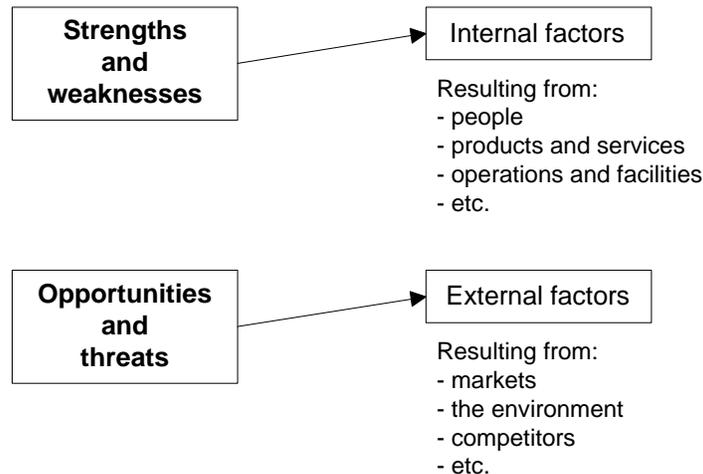


Figure 2: The SWOT analysis – some sources of and organisation’s strengths, weaknesses, opportunities and threats.

Source: Coulthard Max., Andrea Howell and Geoff Clarke, *Business Planning: The Key to Success*, MacMillan Education Australia Pty. Ltd., 1996

The SWOT analysis for Genentech situation can be viewed in the form of a matrix as illustrated in Figure 3.

Based on the situation and SWOT analysis, the strategy of Genentech can be stated as follow: *to utilise biotechnology to produce unique and useful pharmaceutical products to provide treatments for currently untreatable diseases, or to improve upon existing, but less adequate, treatments.*

In addition, this strategy can be drawn up into more specific strategies based on a realistic assessment of the current competitive environment and real assets:

1. Maximise sales of the marketed products.
2. Accelerate and expand product development.
3. Increase the pace of forming strategic alliances.
4. Improve financial returns.

| Strengths | Weaknesses |
|--|---|
| <ul style="list-style-type: none"> - Leading in biotechnological science - Its product (patent) - Strong development pipeline | <ul style="list-style-type: none"> - Research takes a long time to establish new product and new science. - Need excellence scientists. - High cost in R&D |
| Opportunities | Threats |
| <ul style="list-style-type: none"> - It has high growth market - Market specialisation in pharmaceuticals (a few company has specialisation in this field) - A lot of disease hasn't had a right medicine (treatments). - The possibility of a new disease arises. - The possibility of improving on the existing treatments. | <ul style="list-style-type: none"> - Potential genetic competitors - Substitute products (e.g. bovine or porcine insulin) - Unreliable world patent product in many countries. |

Figure 3: A SWOT analysis matrix for Genentech, Inc.

4.1. Maximise sales of the marketed products.

Genentech's products have the potential to treat more patients who have medical conditions for which its drugs are approved through an increase in either market market share or market size. Genetech is able to market its products in a reimbursement environment that increasingly scrutinizes the cost of medical value. For example, obviously somatostatin was selling for between \$30,000 and \$55,000 per gram in small

amounts. Genentech sought to supply large quantities of somatostatin with production costs of under \$30 per gram.

4.2. Accelerate and expand product development

This strategy has three parallel components. The first is developing existing products for new indications. It means significantly shorter development timelines and lower development costs relative to developing an entirely novel pharmaceutical product. The second component of this strategy is to put full resources behind the many products currently in Genentech's pipeline. The third component of this strategy is accelerating the pace of high-potential, late-stage research projects moving into development.

4.3. Increasing the pace of forming strategic alliances

Partnering strategy through alliances with other biotechnology company could help Genentech to foster the growth of its company's pipeline. This partnering strategy reflects its corporate mission - to develop, manufacture and distribute pharmaceuticals that address significant unmet medical needs.

4.4. Improve financial returns

Successful in increasing sales in its products and bringing new products to market will directly benefit to the shareholders. By bringing even more products to market by investing in strategic alliances, and by realizing maximum value for those products stemming from Genentech research, Genentech is leveraging fully both its financial and scientific assets in its continued pursuit of excellence.

5. Seed Capital Era

Seed capital is the small amount of initial capital required to finance the R&D necessary before a new company is set up. The seed capital should enable a persuasive and accurate business plan to be drawn up. The case study presents the consideration of the

seed capital of Genentech which Kleiner and Perkins agreed to provide some \$200,000 of seed capital in return for 20,000 shares of A Series convertible stock. This consideration was provided due to Kleiner and Perkins supported Boyer and Swanson in making detailed investigations of specific technological and market opportunities of recombinant DNA technology.

The specific actions of Boyer and Swanson to limit the seed capital for Kleiner and Perkins are each of them took 25,000 shares of company from the total 90,000 shares.

The resulting structure was to be:

| Name | Shares |
|---------------------|---------------|
| Boyer | 25,000 |
| Swanson | 25,000 |
| Riggs and Itakura | 10,000 |
| Kleiner and Perkins | 20,000 |
| New Partner | 10,000 |
| TOTAL | 90,000 |

Source: Company records.

The limitation of shares for Kleiner and Perkins would allow Boyer and Swanson to take a control of the company due to they had the largest shares. Swanson and Boyer should able to conceive a persuasive and accurate business plan which able to convince the stakeholders of good prospects (financial returns).

Boyer and Swanson had implemented the venture capital strategy due to high cost capital required for building new company which had to develop and produce a particular product using high technology in biotechnological field. Obviously, the money was to carry Genentech through the development of its first commercial product. At the time more capital would be raised to finish the development of the second product and to establish production facilities.

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APPENDIX

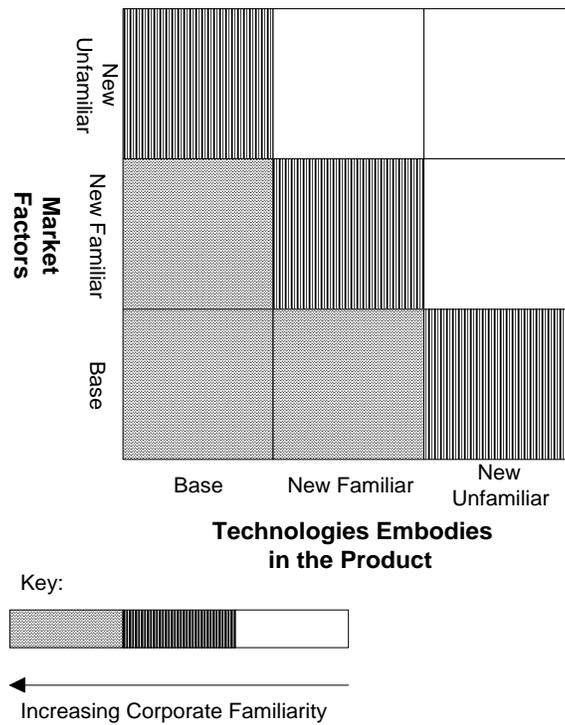


Figure 1: The Familiarity Matrix

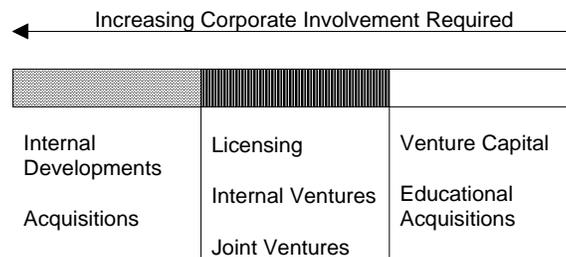


Figure 2: Spectrum of Entry Strategies

Source: Roberts, Edward B. and Charles A. Berry, "Entering New Businesses: Selecting Strategies for Success", *Sloan Management Review*, Spring 1985, pp 3-17.