Building a better biotech company

Lessons learned in Business 101 still apply, even in the fast-moving field of biotechnology.

Lyle Turner

Modern biotechnology has been growing exponentially since the mid-1970s. Part of this growth is due to the creation of new fields. Since the Human Genome Project was initiated in 1990, one field that has exploded is genomics. Efforts to sequence and translate the human genome have resulted in the formation of genomics companies, instrument companies, reagent and toolkit companies, research programs, and service providers whose efforts will forever change how new pharmaceutical compounds and novel products are identified and developed.

Not all of the companies that have flooded into this area will succeed. Their chances will increase, however, if they keep in mind several key business tenets: (1) listen to your customers; (2) continuously evaluate your strengths; (3) align those strengths to address your customers' needs; (4) profitability.

As a model for business success, is this an oversimplification? Probably. But can you succeed without focusing on these issues? Absolutely not. Invitrogen is a perfect example of how one company grew from a startup operation to one of the world's leading biotechnology reagent suppliers by focusing on these four simple business rules. It is a reminder that the basic lessons of Business 101 still apply, even in the fast-changing field of biotechnology.

By listening to its customers and understanding their needs, Invitrogen built core competencies to address those needs profitably, an effective new product introduction strategy, a high-quality manufacturing base, and higher value-added services from its technology base. In the process, it became a leader in supplying highly specialized gene cloning and gene expression tools central for the genomics gold rush.

Understand your market

Invitrogen was founded in 1987 by three scientist/entrepreneurs to make and sell kits to help molecular biology scientists make cDNA libraries. Libraries, or collections, of cDNA are important for identifying new genes. The scientist who developed the kit had no market

experience, and designed the kit as he had been using it in his laboratory. This design did not allow customers to express the gene product of the cloned cDNA. The other two partners, who had worked on the design, marketing, and sales of successful research kits, added two other versions of the original kit to Invitrogen's product line to give scientists the ability to express the cloned genes in prokaryotes and eukaryotes.

Two-thirds of our initial sales came from the eukaryotic expression library kits, and the rest came from the prokaryotic expression version. None of the original nonexpression library kits were ever sold. In addition, customers repeatedly asked for just one part of the kit by itself. We determined that this high-demand part was being used to prepare cDNA for an emerging technique called PCR.

Customer response shaped the market strategy that still drives Invitrogen's supply business. Today, Invitrogen's PCR cloning technology and kits dominate the PCR cloning market, and the company offers the world's largest line of products for gene expression. That these two product lines account for over two-thirds of Invitrogen's revenue is a direct consequence of understanding the market and listening to our customers back in 1987.

Understand your core competencies

Knowing your competencies may be another way of saying, "Know what your limitations are." By knowing what it cannot do, a new company can avoid problems it cannot fix and focus on problems or challenges it can tackle successfully.

As a startup with limited resources, but with some experience in the venture capital industry, Invitrogen focused on short-term product development ideas that could rapidly generate revenues with a minimum development cost. Some of these products failed, but the investment in the failures was low enough so as not to have a significant financial impact on the company. By learning we could not predict new product sales accurately, we decided to concentrate on developing many small projects, a strategy that has been successful.

In this type of market, minimizing the amount spent on each project and killing projects early becomes very important. We have come to believe that in any given quarter, the company needs to have multiple inexpensive

new products under development.

Invitrogen did well in recognizing its financial limitations. However, we failed to recognize the importance or cost of establishing an effective manufacturing base for the new products we were developing. Additionally, we did what kills a lot of young companies—we failed to understand what our manufacturing costs were.

During 1992 and early 1993, the company was plagued by back orders caused by products failing quality control. High scrap rates drove production costs up and slowed sales growth to single digits for the first time in the company's history. None of the founders had any manufacturing experience, and we failed to recognize the company's need for manufacturing expertise.

The problems reached a critical point when Invitrogen ran out of money. Over 15% of the employees were laid off from January to June of 1993. It took the worst of circumstances, but we realized that although manufacturing was not one of the company's core competencies, we needed a world class manufacturing base to be successful. We also recognized that we could not do everything at the same time and solve this problem.

The thought of selling the company was tabled, with the founders instead putting a halt on all new product development and focusing their efforts on reorganizing the company around a stronger manufacturing base. These included bringing the sales force in-house to handle technical support, putting the technical support and R&D staff to work solving manufacturing problems, completely reorganizing the manufacturing process, and putting the entire company through a six-month Manufacturing Excellence program.

By the end of 1993, the back order problem had been solved. For the first time in company history, the day came when there was not one product on back order. Since then, Invitrogen's sales have more than tripled, with no net increase in manufacturing personnel. The resulting reduction in manufacturing costs have driven profit growth to nearly double the rate of our sales growth for the last three years.

Your strengths and customer needs

One of Invitrogen's proprietary technologies,

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BIOENTREPRENEURSHIP

topoisomerase (TOPO) mediated cloning, is one of the most widely used techniques for cloning PCR products. In 1997, we were focused on trying to expand the company's custom cloning service business, specifically its TOPO custom cloning services. We thought that a service based on an automated TOPO cloning system would be seen by pharmaceutical companies as valuable for reducing drug development timelines and expenses. At the time, custom and contract research services made up about 6–8% of Invitrogen's domestic business.

Before offering this more expansive custom cloning service and embarking on the development of an automated high-throughput cloning system, Invitrogen went out into the field, talking with customers about the new opportunities that might arise from this type of custom cloning service. These discussions were not only to gauge interest, but also to help determine a price point for the service. The positive response was so overwhelming that Invitrogen pulled the project back to rethink the objective.

Realizing that we were getting into an area outside of our core competencies of kits and services, we brought in experts in pharmaceutical drug development to help develop a business plan. The goal was to capture more value from this service than what could be obtained

from the sale of a \$200 kit or a \$2,000 custom service. It resulted in a business plan and a presentation that could be used to sell the service to large pharmaceutical companies based on its value. To further test the value of the service, we performed some initial work for Merck and Co. The results were good enough that Merck requested the effort be expanded.

The culmination of these efforts was the creation in June 1998 of a new division, Invitrogenomics. As the functional genomics services division of Invitrogen, Invitrogenomics provides high-throughput cloning and gene expression services to genomics companies and large pharmaceutical and agricultural chemical companies. The division is being directed by a management team experienced in molecular biology services from companies such as Human Genome Sciences and Nanogen, and guided by a restructured board of directors with experience in all aspects of gene and drug discovery from both pharmaceutical and agricultural chemical companies.

Profitability

Invitrogen's 1993 financial crisis, precipitated by its failure to identify the necessary manufacturing and accounting skills needed to be successful, demonstrated the last, most important rule of business—"It's not a busi-

ness if it's not making money."

We had been totally focused on revenue growth for the first five years of the company's existence, believing that as long as there was cash in the bank to pay the bills, everything else would take care of itself. However, it became painfully obvious at the height of our financial crisis that a company without a good history of profits has very limited options: It cannot borrow money and it cannot attract investors. Selling the company might be an option, but only with great difficulty, and certainly not at an attractive valuation. Additionally, new or key employees are not attracted to financially troubled companies, and the emotional impact of a layoff can deeply affect morale for years.

Summary

Invitrogen is a good case study for how to become successful in the rapidly changing field of biotechnology by observing basic business principles. It also shows that even the most successful companies make mistakes. The exciting opportunities that present themselves to high-technology companies in fast-growth fields can divert attention away from the most basic business tenets of quality, profitability, and market responsiveness. CEOs in the biotechnology sector would be well served to review their Business 101 lessons. ///