

Business Planning in the Start-Up
High-Technology Enterprise

Edward B. Roberts

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by

Professor Edward B. Roberts

David Sarnoff Professor of Management of Technology

MIT Sloan School of Management

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No one will question the importance of doing effective business planning. And yet, even including our own research, little objective analysis has been done on business planning in high-technology enterprises. This paper presents some findings from our examination of a series of twenty business plans submitted by startup high-technology companies to venture capital firms in the Boston area.* This is one of our many studies of various aspects of high-technology new enterprises which have been underway since 1964.

The Typical Firm

Of the twenty plans that we examined, ten of the companies had no prior operations, trying to raise money as part of putting their act together. Six of the companies had done R&D only and had generated no sales at the time of submitting the plan for financing. Three of the companies had

*My sincere appreciation is expressed to Robert Sutherland who carried out the data analysis as part of his Sloan School Master's thesis.

completed their product development phase, but had only nominal sales, less than \$25,000 in each case. Only one company had what might be considered moderate sales. That company had been in business for a couple of years and was doing less than \$200,000 in annual sales.

The composite team in these companies consisted of four members. That is good; our early studies of new enterprise performance have indicated that to a great extent, the more co-founders the merrier.(1) One phenomenon to be wary of is the "one man" entrepreneurial setting. Although the solo founder company may succeed, it does so against powerful odds. Within a reasonable range, the more people and skills dimensions that you add to the initial team, the higher the statistical likelihood that you will be successful. That doesn't mean you should go out and do a random recruiting act.

In the earlier studies, we found one company that we classified as having one hundred co-founders. MIT had decided to spin-off an entire small laboratory as a single entity. The whole group became a for-profit corporation. As we had no basis for classifying who was a founder, we counted them all!

The age range of the composite team in our business planning study was 30 to 40 years of age, with a median of 37 years of age. That is rather old, certainly older than our earlier samples of MIT spinoff companies and other high-technology new firms. Those data on close to four hundred high-technology companies demonstrate that if you haven't formed your first company by the age of forty, it is almost a certainty that you will not form a company. I say that despite the fact that our studies did include a few MIT professors who, upon retirement at age 65, found that they still had boundless energy and started companies.

A wide range of college education is represented in the teams that we saw. The only comment I would add about educational backgrounds is that our broader studies indicated that if the dominant entrepreneur was a Ph.D., the firm had a low likelihood of success. I admit this reluctantly, given my

own degrees. Not only does the Ph.D. process drain quite a bit out of you, but Ph.D.-based companies have a high tendency to be research-oriented companies as opposed to technology and product-oriented companies. Ph.D.-based companies tend to be consulting firms, or they carry out government contracting and studies, sometimes doing important analytical work for industry. In terms of business success measured in sales and profitability, however, these kinds of companies tend to be not successful.

That composite of four co-founders typically included two who had R&D or design backgrounds. This is not unreasonable given the base of high-technology firms on which we were focusing. One founder usually had marketing or sales experience. That is a very positive attribute of these startup firms. Our general studies have indicated that having someone initially in the business unit who is explicitly oriented to sales or marketing significantly improves the company's tendency to succeed. The remaining person in the team sometimes had production experience; in other cases he came from accounting, finance, or a background in handling general administrative responsibilities. This is another factor that needs to be taken into account. Our earlier broader studies indicated that the presence of some formal administrative role (e.g., finance or business administration) was also a useful component of the startup firm and correlated positively with success of the company.

The Start-Up Plan

We were forced to maintain proprietary relationships with the venture capital companies that allowed us access to the plans, so we couldn't go directly to the entrepreneurs. Plan assessment was carried out by a careful and systematic diagnosis of the plan documents themselves.

Plan Perspectives

Our first observation, gratefully, was that all twenty plans had some kind of a stated overall objective. You could clearly understand what the companies were trying to do broadly. Only fourteen of the twenty, however, had a specific strategy, formulated and explained, that appeared rational and achievable, before you looked at a detailed evaluation of whether it was really rational and achievable. In our first step toward details, we in a sense lost one-third of the companies. After stating their objectives broadly, six of the companies didn't even provide clear understanding of the overall approach that they were going to use to achieve those objectives; the documents contained only an implied strategy. This deficiency is certainly a detriment to raising funds. It is difficult enough for a venture capitalist to believe in the objectives of the new company; if the plans don't give the venture capitalist the benefit of seeing details on how the firm is going to achieve its objectives, the company won't have much chance for funding success.

As shown in Table 1 we classified the central thrust or orientation of the plan into three different emphases. 47 percent of the plans had as a central thrust the product itself. While product emphasis can be a good

Table 1

<u>Central Thrust or Orientation of Plan</u>	
	<u>%</u>
Product	47
Market	29
People	<u>24</u>
	100

feature for a plan, sometimes that comes across as technology push. You propose that you can do it better than anybody else. However, have you demonstrated that anyone wants it? Have you so focused on the beauty of product that you forgot to worry about its attractiveness from a market's perspective as well as on the ability of your group to carry out company development and implementation.

29 percent of the plans we analyzed focused on the market. Many of those plans, however, only addressed how attractive and growing was the market. Those plans didn't persuade the reader that the start-up group had a clear competitive advantage in that marketplace, or why the new company was going to be able to develop a particular share of that marketplace.

24 percent of the plans focused on the people who were the entrepreneurial team. Despite all the talk by venture capitalists and successful entrepreneurs about people being the most important ingredient for company success, when people are the primary ingredient in the plan serious questions are raised. If you say, "We have assembled a superb team" and, by implication, "Don't worry about our product and our market, because we have the flexibility to shift", you will not instill confidence. The team do not appear to have yet committed themselves to the specifics of targeted activities and participation in the marketplace.

What you really need in a new business plan is a central thrust, whatever it may be, but with an elaboration of that central thrust in both of the other identified dimensions.

Deficiencies in Plans

Let me indicate some of the deficiencies we uncovered in the details provided to support the strategy. 45 percent of the plans that we reviewed lacked emphasis on economic performance. The plans didn't talk about profitability and growth in a significant enough fashion. Profits often appeared to be either implicit or just happened to be included in the numbers. Profits frequently did not seem to be the focus of the founders' discussion of the company they were trying to build. The venture capitalist wants at least the supported promises that the company will make a profit!

In over half of the cases, the plans lacked adequate analysis of the economic environment--the business climate and the extent of competition in the marketplace. And yet only 30 percent had inadequate analysis of the technical environment. In general the plans contain strong coverage of technical dimensions, and I might say overly strong. The plans reflect what the entrepreneurs understand best but they also reflect what they don't understand. Plans frequently described the general technology, where it was going and who was doing what within the technology, with much less attention to non-technical aspects of the business environs.

In terms of the specifics of competition, in most business plans--in this case three-quarters--it is almost an impossibility to identify that there is anybody who competes with the proposed company. To identify a specific competing firm, you really have to search hard. You can read one business plan after another, and be absolutely certain that three out of four new companies come to full fruition out of the head of Zeus, in a brand new marketplace that nobody has ever been in. This may be wishful thinking, but is usually incorrect and dangerous planning.

Finally, in terms of a broad-based deficiency, almost half of the company plans suggested that they were trying to do too much broadly or too many different things at once. Plans often enumerated multiple product lines at the outset. They listed large numbers of markets that the company would instantly attempt to enter and conquer, without really communicating a rational allocation of resources or priorities so as to demonstrate focus.

Functional Planning Deficiencies

In terms of the specific functional areas, we looked at and divided our analysis into four clusters--the marketing plan, the management team, the R&D

Table 2

Inadequate Functional Plan in Critical Area

	<u>% of Plans Reviewed</u>
Marketing plan	70
Management team	65
Research and development plan	45
Financial plan	60

plan and the financial plan. In terms of our assessment, very carefully drawn, we found that the marketing plans were inadequate in 70 percent of the cases. The management team had deficiencies in 65 percent of the cases. The R&D plan was deficient in only 45 percent of the cases. The financial plan had major deficiencies in 60 percent of the cases.

Let's look at marketing first. In only 40 percent of the cases had the company formulated a specific marketing strategy, stated or implied. In 60 percent of the cases, they hadn't.

In 50 percent of the cases, you could understand from the plan that the company was targeting a very specific market segment or specialized niche. That at least provided an understanding of how to assess marketing, because

it wasn't just a product for everybody; it had a particular orientation. The reader (or venture capitalist) could then worry about whether or not that target was a real market.

In 30 percent of the cases, the company had developed a detailed sales (not marketing) plan, and had stated what those details were--how many sales-people--why, where, and when--means of compensation, and the like. In 20 percent of the cases, a broad sales plan was implied but not specifically detailed. You had to read between the lines to come up with the details. 50 percent of the cases did not contain any sales plan. The entrepreneur may well have said, "Sales are going to be realized because we are going to have a good product aimed at a great market." That's fine, but how specifically is the firm going to get customers to give you orders? This needs inclusion as well.

In general, this type of deficiency tends to reflect a lack of appreciation of the selling function by people who form companies based largely on beliefs in the technological advantages that can be provided to a market. One company I remember from our earlier studies was co-founded by five MIT graduates. They rotated, for several years, the position of vice president of sales. They did that because no one wanted that function. The company got off the ground and got to an early low threshold and stayed there for about eight years. Then, they totally reorganized, the company brought in an experienced sales vice president, and grew substantially.

In terms of market research, in 70 percent of the plans only broad brush market research seemed to be evident. In 25 percent of the cases, at least one team member was shown to have had personal sales experience in the particular

Table 3

Market Research Issues

	<u>%</u>
Approach to establish existence of market "broad brush"	70
Personal sales experience of team member	25
Detailed customer survey	25
Plan indicates detailed knowledge of potential customer	45

market and could relate to the market personally. That has some real credibility in the plan. 25 percent of the plans described results of a detailed customer survey that was evident as a representation of what was going on in the targeted market. In 45 percent of the cases, the plan somehow succeeded in indicating a detailed knowledge of the potential customer and what was important to that customer.

I must say that you don't always have to demonstrate market research to have a successful business plan. Several years ago, I interviewed the founder of a company that had started in the business of high-speed transistorized electronic modules for use in the assembly of digital systems. I asked him how he had known that his product would sell. The entrepreneur responded, "I was a project engineer at MIT working on digital systems. I knew I would have used those circuit modules if they were available." I asked, "Did you talk to other people?" He said, "I knew there were hundreds of guys just like me who would have been delighted to have had such a product." I am not about to disparage that founder, Ken Olsen, or the accomplishments of Digital Equipment Corporation, despite the absence of clear market research at the initiation of DEC!

Indeed, I might add the reinforcement that our earlier studies of high-technology companies had uncovered a negative correlation between whether you carried out

formal market research and whether you succeeded as a company. Our hypothesis was that if you could carry out market research, you were already too late to build a new business in that area. Despite the anecdote and our statistics, venture capitalists do gain confidence from a plan that suggests that you know something about the customer and market to which you are trying to sell.

Our next area of analysis was the skills composition of the management team. I strongly emphasize that venture capitalists are very concerned with the ensemble of critical capabilities. In three of the twenty business plans we reviewed, someone else was needed on the research and product development side of the group. In 40 percent of the cases, marketing was absent from the team. 35 percent of the teams had a marked deficiency in operations, in cases where operational skills seemed to matter. We are not talking about a software organization where the factory consists of desks and people sitting in front of them. We are referring to cases where the company was proposing an activity that needed a manufacturing capability but yet had no manufacturing skills among the founders. Any of these omitted critical roles can doom not only the business plan but, more importantly, the business itself.

In 45 percent of the business plans we reviewed the technology appeared to

Table 4

Uniqueness of Technology

	<u>%</u>
Unique technology	45
Some characteristics of uniqueness	40
Not unique	<u>15</u>
	100

be unique. Our broader earlier studies determined that one of the strongest correlates of new company success was the movement rapidly to the market of an

advanced technology drawn from major MIT laboratories or academic departments or from other advanced R&D organizations. A start-up company doesn't have a lot going for it. The most likely possible advantage is that your technology is far better than anything else that is available in the market. The company may be small and under-resourced, but it might have a technical edge on the competition. If as an entrepreneur you can't honestly find something unique about your technology, you had better be strong in indicating in your business plan why your start-up enterprise has the capacity to overtake much larger companies.

40 percent of the plans asserted some characteristics of technological uniqueness, and 15 percent of the companies claimed no unique technology at all. These latter companies have the burden to prove that success is attainable without unique technology.

One further aspect of the technology is the extent to which it is protected. Only 45 percent of the plans even discussed the protection of technology. 25 percent of the companies had taken steps to patent their technology, and in 10 percent of the cases the technology could not be patented or the patent had expired. I don't want to overstate the importance of patenting. It isn't vital in most high-technology firms; it is critical in some. However, the notion of discussing technology protection in the plan is important. The key is whether the unique qualities of the company can be maintained, not whether the product can be patented.

Let me turn finally to financial aspects of the plan. In 10 percent of the cases, no financial statements were included. This is inexcusable. You shouldn't expect people to deal with you financially and invest money in your proposed company if you don't provide them the basis of a business plan that

Table 5

Projected Financial Statements Included

	<u>%</u>
None	10
Data not available	5
One to three year income statement only	10
Four or five year income statement only	40
One to three year income statement and balance sheet	15
Four or five year income statement and balance sheet	<u>10</u>
	100

communicates expected financial outcomes. 5 percent of the plans included bare outlines of financial statements but the specifics weren't included, saying that the data were not available. Some plans promised that more financial information would be provided in a later submission.

In 10 percent of the cases, a one to three year income statement was available. Any prospective entrepreneur who doesn't know what an income statement is, had better learn fast! 40 percent of the plans contained four or five year income statements only. In one case out of four, both multi-year income statements and balance sheets were included.

10 percent of the proposals provided financial plans based on multiple sets of assumptions. In these days of VisiCalc, an entrepreneurial team can roll out as many variations on a financial theme as anyone could ask for. You almost have to hold back. You can alter market penetration assumptions, startup costs, or competitive responses and generate alternative financials based upon whatever you want to put forward.

Only 20 percent of the cases, in our judgment, included adequate supporting detail for the financial plans. The other 80 percent, even when there was a financial plan, lacked the supporting detail to back it up.

One anecdote merits repeating on the issue of including an income statement and balance sheet in initial plans. Ken Olsen commented that he and Harlan Anderson approached American Research and Development Company (AR&D) with their proposal to get funding for Digital Equipment. They were told that while the project was interesting, they needed financials in their plan. But as two engineers from MIT's Lincoln Lab the entrepreneurs didn't know much about how to create financial plans. Then Olsen remembered that he had taken first-semester economics at MIT, and that he still had his copy of the 1951 edition of Samuelson's classic book. In his section on accounting, Samuelson tells you how to put together an income statement and a balance sheet. The example is Pepto Glitter Inc. Olsen said they really didn't know what AR&D wanted, but they copied out all the entries for Pepto Glitter Inc., changed the name, and plugged in a few different numbers. AR&D told him later that it was one of the most sophisticated business plans they had ever seen! The \$70,000 that AR&D invested for 70 percent of Digital Equipment turned out to be worth billions.

Venture Capital Funding

At the start-up of the firm, sophisticated financial plans say less about whether you will be successful ultimately and more about whether you will be successful initially. Initially, success will constitute getting money from that venture capitalist!

The data of Table 6 indicate the relationship between the adequacy of these business plans and whether or not the companies received venture capital financing. When the overall plan was assessed by us as having had minor

Table 6

Relationships Between Deficiencies in Plans
and Success in Obtaining Financing

Overall Assessment of Plan	(Number of Plans and Percentage of Plans Reviewed)	
	Enterprise Financed by a Venture Capitalist	Not Financed by a Venture Capitalist or Data Unavailable
Minor Deficiencies	4 (20%)	1 (5%)
Moderate Deficiencies	4 (20%)	3 (15%)
Significant Deficiencies	2 (10%)	6 (30%)
	<hr/> 10 (50%)	<hr/> 10 (50%)

deficiencies overall, four out of five were financed by venture capitalists. One of the plans was not initially financed by a venture capitalist. Perhaps it was done considerably later, however. When we found moderate deficiencies in the business plan, four out of seven of those plans were financed by a venture capitalist. If, in our evaluation of those plans, the plan contained significant deficiencies, only two out of eight got funded.

One critical aspect of the business plan is that if you don't do it right, there is a high likelihood that you will never do anything beyond it. Business planning needs to be undertaken seriously if for no other reason than it is a major tangible representation of who you are, what you are and what you want to be, to the venture capital community. It may also even relate to later business success!

References

(1) Reference in the paper to our earlier studies include an entire body of investigations on new enterprises, entrepreneurs, venture capital, etc. Two citations of possible interest are:

- a. Roberts, E.B., "Entrepreneurship and Technology", Research Management, July 1968 (vol. 11, no. 4), 249-266;
- b. Roberts, E.B. and Wainer, H., "Some Characteristics of Technical Entrepreneurs" IEEE Transactions on Engineering Management, August 1971 (vol. EM-18, no. 3), 100-109.