Strategy and Business Planning for Artificial **Intelligence Companies:** A Guide for Entrepreneurs

Like most consultants, we have developed certain paradigms that we use to help our clients. We have worked with both entrepreneurs starting small technologyoriented business and with sources of venture capital. Frequently, we find that there is a gap between these two groups created by vastly different goals and objectives as well as diverse communication styles. The unfortunate result of this gap is the difficulty many startups experience in obtaining capital.

We do not intend to provide a comprehensive review of business theory, to contrast our methodology with others, or to provide a historical perspective on venture capital. We also ignore a large body of reference material to instead focus on the more pragmatic topic of what actual entrepreneurs do that is right and that is wrong. The concepts in this article are not restricted to the field of artificial intelligence; they are equally applicable to other technology-driven entrepreneurial, or intrapreneurial, efforts.

Development and Implementation of a Corporate Strategy

Often, the long-term considerations of strategic planning and the tactical concerns of a startup operation seem to be at odds with each other. This is unfortunate because strategic planning is essential to a small firm, spin-off, or new ventures group even if the corporate planning document (not to be confused with a business plan for seeking capital!) is not.

Hi-Tech Venture Consultants frequently uses a simple model we call a Z-Plan to sort out these strategic planning issues for smaller companies and startups (see Figure 1). The steps in the Z-Plan are similar to those in the standard scientific, engineering, and business review that larger companies perform. We have endeavored to recast these reviews into a form more suitable for a smaller organization that doesn't have the time, resources, or need

Robert A. Friedenberg and Ralph L. Hensler are principals in the firm Hi-Tech Venture Consultants, Inc 471 West Broadway New York, New York 10012 (212) 982-4485

for weighty planning tomes. Additionally, we find the Z in the Z-Plan to be a useful guide for relating technicaland business-planning issues, a step most larger companies perform poorly, if they try at all.

The basic premise of the Z-Plan is that both the formation and the execution of a new business or product require a separate review of scientific, engineering, and business issues in order to develop stable goals and objectives. These reviews should involve the entrepreneur, seed capital investors, and independent consultants and should result in a consensus about the directions that evervone's efforts should take. Usually, we find that it's best to have thought all of these issues through before seeking substantial amounts of financing. In fact, the Z-Plan makes a natural precursor to developing any formal documentation, that is, a business plan for use in approaching sources of capital.

The important components of a Z-Plan are idea generation, design specifications, business strategy, software development, software production and beta testing, and sales and marketing.

Idea Generation

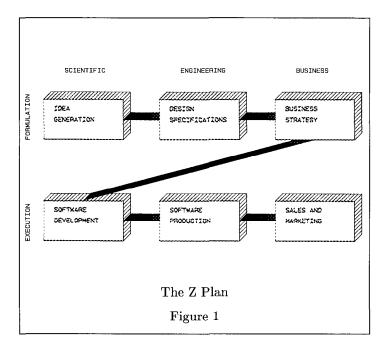
This is the realm of the entrepreneur. By the time there is something to plan about, the idea has been hatched.

Design Specifications

Frequently, we find that although the product has been thought out conceptually, the nuts and bolts impact of the software engineering was not thoroughly thought out

Abstract

This article provides some basic assistance to entrepreneurs involved in artificial intelligence, offering a synthesis of standard business-planning and capital-raising practices. Three main areas are discussed: (1) developing a corporate strategy, (2) developing a business plan that works, and (3) approaching sources of capital.



during the idea-generation stage. An unforeseen design aspect can alter the funding or timing requirements of the project. Some questions you should consider follow

How might the product fail in a real-world environment, and how will it be serviced or upgraded? For products still requiring substantial R&D, careful consideration must be given to how the product will be superseded by you or by others.

Are standard rules for software and hardware design being followed to the maximum extent possible? It is often difficult to choose between preserving a proprietary technique and isolating yourself from the marketplace.

Is there a costly implementation process that can be replaced by something less exotic? (For example, is it possible to integrate an expert system with existing database and communications software?) Your clientele might perceive the cost-quality trade-offs differently from you, for example, focusing more on compatibility with existing hardware and converting existing files than on the subtle points of knowledge representation and expert simulation. (see Example 1):

A financial institution only considers Al applications that do not require Al hardware, even as a "knowledge server." The institutions perceive of it as too brittle. In addition, the institution considers it the Al vendors' responsibility to fit software into their financial institution's current environment, using existing client files, online quotes, and so on. The vendors' skills in these conventional areas turned out to be the most important factor in the purchase decision.

Example 1

Business Strategy

The development and implementation of a business strategy is a critical process for any new venture. In essence, it is a model of the major elements of the business for the next five (or however many, but this is a figure the venture capital community likes) years. This strategy represents all aspects of the business, including suppliers, operations, consulting, marketing, and accounting and not just R&D, sales, and product development. Some things to think about follow:

What activities are going on other than R&D, marketing and product development? These activities and their associated costs need to be included in order to ascertain the correct amount of capitalization.

What are the key developmental milestones? Are they small enough steps to quickly indicate whether the project is ahead of or behind schedule, or over or under budget? These milestones make you credible to investors as well as provide a basis for project management.

How much time, salary, and equity will it take to attract the type of human resources required to transform an idea into a company? This requires a hard look at the differences between creating and maintaining a new venture.

A company with a voice-vision telephone product discovered as a strategic model was being built that, rather than dealing primarily in manufacturing, the company would be dominated by sales and marketing in terms of expenditures and personnel. In order to keep its new venture lean, the company entered into a strategic joint venture with more established telecommunications companies in order to obtain sales and customer service help.

Example 2

We are ignoring a rather large topic called an environmental or macroeconomic review. Larger corporations usually pay more attention to the environment than smaller corporations. This is probably not a critical area for an AI startup company. Just be careful to avoid getting caught by surprise like the solar energy industry, where deregulation of natural gas prices hurt many companies badly.

Software Development

We find that most new ventures are very clear about the ultimate goal of their R&D efforts. They are also aware of the resources required for direct support, given the project runs smoothly. Less thought, however, is given to how these resources interrelate and how the entire project is to be managed. Neglecting these issues can result in both the direct and indirect costs of a project getting out of hand. Although there are formalized techniques to assist

with project management (Pert charts or the critical path method), we generally prefer to use a simpler process:

Start with the well-defined goal, and work backward. The end product of an R&D project is dependent on the completion of a number of tasks, each of which is dependent on the completion of a number of preliminary tasks, and so on back to the definition of the goals. All of these tasks should be listed or drawn on a chart.

Make a note of which tasks have less certain timetables and which tasks have the greatest number of other tasks dependent on them.

Judge critical to your development effort those tasks whose time to completion are difficult to estimate and which have many other tasks dependent upon their conclusion. If many aspects of your effort depend on any tasks, these tasks need to be carefully controlled to avoid delaying the completion of your product. Stand-alone tasks with uncertain timetables present localized risk but shouldn't endanger the entire project.

Software Production and Beta Testing

Once the research is completed, product development begins. As part of the Z-Plan, you should consider:

Does the idea fit neatly into one product, or does it appear to have multiple uses? If so, do all of the potential clients need the same version, or should there be several variations (for example, an application generator that could be sold as either a generic product or as a variety of applications)? This should be considered as part of the business strategy, but our experience has shown us that this issue pops up again at this point in the development process.

What incremental product-line extensions can be made? Are there variations of the basic concept that can lead to new products in order to sustain the new venture? (See Example 3.)

A firm making microcomputer firmware packages to teach the sciences expanded its product line as one might expect to include all the basic sciences. While producing these packages, it occurred to the firm that it could use the same basic software and peripherals for entertainment products. The addition of this new product line reduces investor risk and is expected to make it far easier for the firm to obtain capital.

Example 3

Sales and Marketing

Most new ventures have thought about who they would like to target as customers and how they would like to distribute their product. From a more strategic standpoint, you should also consider the following:

What product are you hoping to replace and what advantages do you offer? Every technology has a predecessor and a successor.

What product might replace you, and what are you doing about it?

How do both of these issues look from your customers' perspective? Frequently there are barriers to converting from one technology to another, especially when yet another technology is on the horizon.

Finally, you should have learned from this discussion that you are the one who should be pursuing your own technology's successor most vigorously. As a result, by the time you execute all of the steps in the Z-Plan, you might be ready to start a new one.

Production of Appropriate Documentation

The appropriate documentation for any new company is a business plan. This plan must describe a business, not a product or a technology. This is the most common fatal flaw in the business plans that we review. Also, venture capital firms tell us that the major reason they reject a plan is not because of a new venture's technology but because of an unconvincing marketing and management presentation.

We strongly recommend that every startup get assistance in writing and promoting its business plan. The reason for this is that the entrepreneur has been living and breathing AI software for a substantial period of time. Even if you have a good background in strategy, marketing, financial analysis, and management, you are likely to have difficulty sorting out the issues you believe are critical from those potential investors believe are critical; you are too close to the day-to-day tactical problems. Many consultants will work out an arrangement for compensation based on stock or on cash from a company's capitalization, so that there is little or no initial cost to the startup.

Depending on the type of capital being sought (partnership, seed money, startup, first stage, second stage, initial public offering, joint venture), various sections of the business plan are modified to include legal and accounting sections. We recommend that a document strictly containing the business issues be circulated (with suitable disclaimers) prior to any official offering document. This modified document is less expensive to produce and is an excellent marketing tool that can be distributed to potential investors to provide some feedback.

A typical table of contents for the business plan of an AI software firm is shown in Figure 2. Some of the key issues in writing a business plan are:

Executive Summary

This is by far the most important section of a business plan. You have perhaps five minutes to capture the interest of a potential investor or a screener of business plans at

Acme Expert Systems Preliminary Business Plan Table of Contents

Summary

The Company
Product and Service Description
Marketing
Management Team
Financial Requirements

Description of AI Technology

Predecessor Technologies/Methods Successor Technologies/Methods

Acme Expert Systems Product Description

Initial Product Product Line Extensions Potential New Products

Market Analysis

Definition of Potential Market Market Penetration Strategy Market Research Program Distinctive Competence Competitive Analysis/Risk Factors

Distribution Strategy

Financial Analysis

Five Year Projection Assumptions Use of Capital

Appendix

Background of the Principals Relevant Articles Audited Financials (if available)

> Sample Business Plan Table of Contents Figure 2

a venture capital firm. If you do not hit all of the critical points in that amount of time, your plan is not read further. Some of the key issues to keep in mind when writing the summary include the following:

The executive summary must be totally self-sufficient. In all likelihood, the person, if any, who reads the body of the plan is not the same person who reads the executive summary.

The summary should contain absolutely no jargon. Even if the person reading the plan has a technological background, the plan is also usually circulated to non-technical people. Rummage through some AI articles in Business Week to get an idea of the level of sophistication to use.

Include key financial numbers and graphs. Do not be concerned about redundancy between the summary and the body of the plan, even if text is repeated verbatim. This is actually a good educational technique.

Description of AI Technology

The purpose of this section is to educate potential investors who are unfamiliar with artificial intelligence. We usually take a somewhat historical approach, focusing on the development and validation of the projected market. A good level of sophistication to use in this section is that used in *High Technology* magazine. In this section list predecessor and successor technologies and methods.

Predecessor Technologies and Methods—Describe relevant software concepts that fulfilled more or less the same role in the eyes of the consumer. Do not attempt to portray your program as unique; if nothing else, there is a noncomputer way of performing a similar service (later, there is a discussion of distinctive competence for selling unique benefits). It should also contain relevant success stories and notable failures.

Successor Technologies and Methods—A look ahead at emerging technologies is often overlooked in the general technology review. In this section, you can evaluate what the expected life of your product or service might be and what product or service might succeed it. This is an important section; without it potential investors tend to assume that a technological product, especially software, will become obsolete before they can recover their investment. One need only look at the recent commercialization of expert systems to sympathize with this perspective (see Example 4).

A firm is selling turnkey photovoltaic cell factories. When asked about the successor to the technique, the firm revealed it was the leader in research in this area. Adding a description of its research to the offering document assisted this firm with its second public offering.

Example 4

Product or Service Description

It is extremely important that you describe your product or service and not your technology. First, decide if you are selling a product or a service. With software, there can be a subtle difference. Concentrate on what the end user is buying in terms of tangibles, features, functions and services. Some sections to include are descriptions of the initial product and product-line extensions (see Example 5).

Initial Product—Describe the initial product. Be careful that you are not blurring several products into one.

Product-Line Extensions—If there are variations to your product that you might sell in the near future, include them as product-line extensions. This could include "new and improved" versions of your software or versions for different applications.

Potential New Products—Here you can include new applications of your basic programming technology, for example, a new shell in which to build applications. Every product has a finite life cycle. Evidence that you've given thought to new products makes investors feel they are investing in a company rather than a product.

A firm is marketing energy management equipment that is produced by others for commercial use. This firm hired us at the behest of its investors to explore alternative types of equipment for the same market (product-line extensions) and to find other residential and industrial energy management products that it could also market (new products).

Example 5

Market Analysis

This is the next most important section to the executive summary. Now that you have let a potential investor understand your software and its place in the larger world, you must address the questions of how many dollars are in your market, how you plan to go after them, who is competing with you, and how you plan to deal with them. We generally break this rather formidable task into five smaller areas: potential market definition, market penetration strategy, market research program, distinctive competence, and competitive analysis and risk factors.

Definition of Potential Market—The total of all the expenditures that could be made for your product or service must be defined. This is not to say that all of these customers will buy your product or even buy competitive products, but the universe must be defined. For example, if you developed a customer-service expert system for banks that sells for \$1000.00, your potential market is

Banks × # Customer Service Terminals per Bank × \$1000.

This figure should be far in excess of what you actually plan to sell on a cumulative basis so that you are not thought to be saturating your market and should also reflect potential growth. There is always suitable market-size information available, although it can be difficult to dig up. Try phoning your competitors and the market research firms referenced in business periodicals and trade journals if you are having difficulty (consultants can be particularly helpful in this area because they are considered neutral). We recommend that you always try to reach

line engineers and researchers as opposed to salespersons. State your desire to get nonproprietary background information and references. Make it clear when dealing with a research firm that you are not a potential client and that you are seeking a few leads and not information contained in their reports. Finally, build a network of contacts. Ask every person you call for the names of others you should talk to. (In our discussion of marketing, we give an example of how we obtained market size and competitive information for a small market.) Finally, you must also segment this potential market either by type of potential client or by geographic region. If you have more than one product or service, this segmentation must be developed as a matrix for each product line.

Market Penetration Strategy—Here you must describe how you will approach the potential market that you previously outlined. Some important considerations are what your position is (low-cost producer, high-quality producer, specialty product); which products will be pursued first and for what market segments; what type of sales force will be used; how customer service will be handled; what existing companies will be used for joint sales, marketing and distribution and what types of promotions will be used.

For a startup, we believe that the market-penetration strategy should not focus on unknown detail. Writing volumes on pricing strategy, for example, is more appropriate for established companies selling established products in established markets than for a startup. An investor would probably rather hear about why a potential customer would find enough value in your product to pay more than it cost you to provide. We have found this to be no small issue with regard to expert systems.

Market Research Program—On an ongoing basis, any startup needs to keep track of competitors and, more importantly, feedback from customers. It is always a good idea to formalize a tracking system as part of a program in order to give potential investors confidence.

Distinctive Competence—All of the factors that you believe will make you succeed in a new market with a new product must be listed here. Be sure to discuss your product or service, technical skills, AI experience, management experience, marketing skills, subject matter expertise and anything else that you do well and might relate to your new venture. Attach an organizational chart here if you are a startup (have a separate section on management if you are an operating company). It is critical that you make your management levels appear as deep as possible. This can be accomplished by having your key shareholders and business advisers on a board of directors and your technical advisers and subject-matter experts on a board of advisers.

Competitive Analysis/Risk Factors—We recommend a three-level approach to competitive analysis. The first level is products that are directly competitive with you (for example, other AI software). The second level is other types of products and services that currently fulfill the same need in the marketplace that you propose to fulfill. The third level is companies that can easily compete with you if they desire to (see Example 6).

There are also three levels of risk factors. There is the internal risk that your product will never operate as anticipated or that you will fail to deliver it at the promised cost in the promised time frame. There is the external risk that the demand will be lower than expected or that a competitor will gain the market share and squeeze you out. Finally, there is the technology risk that as AI software advances, your product could experience a much shorter life cycle than necessary to please investors.

We refer once again to the voice-vision telephone firm. We followed specific procedures to obtain background, market-size, and competitive information. Using Dow Jones News Retrieval, we downloaded encyclopedia information about AT&T's original vision phone and teleconferencing product. We did a text search of teleconferencing and vision joined with "telephone" in the online version of the Wall Street Journal. The nonelectronic analogs to these steps are fairly straightforward. This process revealed the names of several small firms, usually with their location, with new products in the area. Telephone calls to these firms resulted in product literature, annual reports, and other company's efforts in the voice-vision telephone area. Some of these brochures referred to trade magazines we were unaware of and compared different products and technologies by specification and product function. By continuing this networking, we had a good feel for the industry in a few weeks at almost no cost and in spite of the fact that this area is not really covered as yet by stock market analysts, market researchers, and the like.

Example 6

Financial Analysis

The financial analysis should include a five-year projection and the assumptions on which all your figures are based.

Five-Year Projection—Pay attention to accounting conventions, styles, and formats when you develop financial projections. Being clear isn't good enough. Always keep key schedules on one page, and use supporting schedules if necessary. At a minimum, you should have a monthly schedule of operating profit for the first year, an annual income statement for the first five years, a balance sheet for the first five years, application of capital proceeds, and revenue breakdown by product and market segment for the first five years. The more supporting and detailed information you have the better, but put it in an appendix. The potential investor doesn't want to see it (although the investor's accountant might) and it is this

person who is your target audience. As a final note of advice, include graphs whenever possible.

Assumptions—For every line possible on every schedule, state explicitly the assumptions being made. If you estimate a number because you have supporting data, reference it clearly. State any depreciation and amortization lifetimes used, the average payable and receivable periods assumed and why, and any inflation assumptions. Be careful about overusing statements such as "Management's Estimate."

Other Sections

Depending on the product or service, other sections are frequently needed. Some examples of these include manufacturing strategy (not likely for software!), distribution strategy, and joint venturing strategy. If a factor you consider critical to your firm is not included in our guideline, by all means create a section. Be very careful to review your plan. Be sure that the reader doesn't need to know facts for section A that aren't defined until section C. Although this might sound obvious, we find that the liberal use of cold readers (people unfamiliar with the company or even the technology) always produces some surprising errors in continuity.

Appendix

Include in the appendix any information on the principals, articles from business publications that might be relevant, an operating history if available, and any other supporting information that you consider important but too detailed to be included in the body of the report.

Background of the Principals—A brief resume of each officer, director, and adviser should be included. Please remember that this is not a forum for convincing readers you are smart or well published or have had an interesting career. Strip everything away that doesn't contribute to the narrow goal of making your company credible. We recommend a maximum description length of one-half page for the key technical person and the president and less for all others. Make sure all of the resumes are in the same format.

Relevant Articles—First, get any articles in business publications (for example, Business Week and High Technology) relevant to your market. Second, include any review articles on the appropriate AI technology. Third, include any technical articles, especially those written by the principals of your firm (the potential investor will almost certainly want an independent review of your product, and you should make that as easy as possible). Last, include literature from any competitors, especially that from any company with conventional software or a noncomputer technique you expect to replace. If your product is truly superior, there is no better way to deal with the competition than to let the competition describe its product in its own words.

Audited Financials—If you have an operating history, make it easily available to potential investors.

Approaching Sources of Capital

Although much can be said (and has been—contact the small business unit of any of the "Big 8" accounting firms) on the mechanics of seeking capital, we contain our discussion to some stylistic issues—such as placing a value on your company, doing your homework, defining your role and being professional, and being flexible—that are frequently "deal killers."

Valuing Your Company

One of the things that you must due before anything else is to value your company. We approach the valuation process from the perspective that the value derived from the process is a secondary result of the more important process of deciding how large a percentage of the ownership of your firm you must give up in order to get the capital you require. This is not a mathematical calculation but a complex process involving many issues such as the following:

Dilution and Control—If an investor puts \$1,000,000 into your startup and gets 30% of the stock, the investor's shares are worth \$300,000 book value. At the same time, the investor has created an implicit market value for your company of \$3,333,333. If you owned 50% of the stock prior to this investment, you now own 35%. You must establish how much control you are willing to give up in this round of capitalization and still remain sensitive to the investor's perspective.

Return on Investment—Many venture capital firms have a minimum acceptable return on investment. Your five-year projections must show a decent return on investment in order to justify the investment on a value basis. To continue with the previous example, if the original capital plus the retained earnings (assuming no dividends) was \$15,000,000 by the end of year 5, our hypothetical investor's \$1,000,000 investment is worth 30% of \$15,000,000 or \$5,000,000 which is a return on investment of about 38% per year.

Use of Proceeds—Even if the dilution and the return on investment are acceptable, any potential investor will be concerned over how efficiently the proceeds of his investment are utilized. The best way for him to increase his return on investment is to invest less. It is common for a startup to find that they cannot get all of the capital they believe they need from an investor regardless of the percent of ownership they are willing to give up.

Homework—Before you send any business plan around, call some potential investors (or better yet have a neutral party such as a consultant call) to identify the right individual in each firm you approach. Then, call this individual and tell him about your business and see if they would like to review the plan. This can keep your document out of the large pile that sits on every potential investors desk.

Roles—Your role in your own corporation will change as a result of an infusion of capital, and any investor is unlikely to provide capital without a role in the company's management. This is often difficult for an entrepreneur to deal with. Our advice is to decide if your ultimate role is to be technical, marketing or managerial (one only!) and relinquish the other responsibilities to new additions to your firm. A corollary of this is that very few successful entrepreneurial ventures are controlled by the entrepreneur, but rather the founder will become chief scientist and/or have a strategic role. Day to day management is left for managers. Many investors we talk to will avoid any product, no matter how promising, if they feel the founder won't relinquish control of certain business issues. We have had dealings with a firm in the waste to energy business that has had enormous difficulty getting capitalized due to their desire to limit outside investors' managerial role. They perceived of venture capital as some sort of bank with higher interest rates, while venture capital sources perceived of them as uncooperative and too risky to deal with.

Professionalism—The business world has its own culture, jargon, mannerisms, etc. Enrepreneurs who appear to function better in their environment are generally felt to be more professional whether or not this feeling is justified. The principals of the waste-to-energy firm previously mentioned did not volunteer certain information to potential investors because they believed the information would reflect unfavorably upon the company. Although the entrepreneurs didn't avoid any direct questions, their lack of communication contributed to the unfavorable perception investors had.

Working Flexibly

Frequently, an investor will want to team you up with other companies he or she knows of, to introduce new suppliers, to develop new products, or to pursue new markets. By all means consider these alternatives. (See Example 8.)

We are in the process of introducing a firm with a handheld online terminal to a competitor with what is perhaps a better technology and another firm with home energy controllers to a similar firm that could fill in a gap in its product line.

Example 8

Who to Send It To

Everybody. We generally find that concepts and early startups (those looking for seed capital) do better with industry support. Many companies you perceive as suppliers, distributors and even competitors might be sources of capital. The companies generally would perceive syou to be a cheaper and faster alternative to an internal development effort. Formed companies that are ready to begin operations (looking for startup or first-stage capital) will appeal to the venture capital community and affluent individuals. Operating companies (looking for first-stage or second-stage financing) should consider the venture capital groups of larger financial institutions, public offerings such as a "Reg D," or even project financing. These guidelines are very loose, however.

What the Investor Is Looking For

Different potential investors might be looking for different things from your company. These different goals can impact the type of deal they seek and the level of control they want. Some books, such as The Guide to Venture Capital Sources, or Venture Magazine give this information, but you can always ask the investor. Some goals they aim for follow:

Return on Investment—This is by far the most common investment goal of the venture capital community. The investor will want to be involved in all managerial, financial, and marketing decisions in order to have your company grow as rapidly as possible. Technical areas will be impacted less.

Risk Diversification-Sometimes, it is not only return on investment that matters but how the risk of your company might relate to the risk of other startups. This concern is particularly true with venture capital funds or partnerships. These types of investments enable retail and institutional investors who are not venture capitalists to invest in these areas.

Strategic Partnering—A company that is a potential client of yours or a potential supplier to you might perceive you as an opportunity for vertical integration. A larger competitor might perceive you as an opportunity for horizontal integration. Partnering presumes that your company is left intact as either a subsidiary or a division of the acquiring firm. The strategic partner can be relatively uninvolved or can be intimately involved with your firm.

Technology Transfer—As opposed to integration, a company might invest merely to get access to technology in a less expensive manner than it would through internal development. Because the technology is an AI company's only real asset, this could leave your startup in poor shape. The problem is that you usually can't tell in advance if your suitor is interested in integration or in technology transfer. The investing company might not even know itself.

Strategic Venture Capital Pools—This concept is a blend of the risk diversification idea and the integration idea. A company will create a pool of capital to invest in several opportunities for investment purposes, then screen the candidate startups to choose those which are working on technologies that might have long-term strategic value for them. The best-known company to use this strategy is General Motors.

Summary

In summary, entrepreneurs must look beyond their own experiences when proposing to turn a concept into a business and capitalize it. This applies to each of the three phases of forming a business we have described in this article the development of a corporate strategy, the production of documentation, and seeking capital.



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