Age of Discontinuity and Technology

Financing new technology in new companies requires multiple approaches; be prepared for the unexpected.

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We are living in a time of accelerating change. The 1950's and 1960's — in fact through the oil embargo of October 1973 — were decades of continuous economic growth. Most of us are here today because we mastered the business strategies that worked so well during those halcyon days.

My theme today, and the basis on which Dynapol is run, is that these past strategies are no longer valid. Today all companies, but especially new companies developing new technology, must adapt their strategies to a changing, oscillating economic and social environment.

I write from personal experience. We formed Dynapol in 1972, raising $6 million in two weeks from traditional sources. With good progress toward our goal of developing nonabsorbable food additives, we began a second round of private financing in October 1973, expecting it to take 90 days. Eighteen months later, we had raised $7 million through a private placement of equity, a business arrangement based on a product in research, and the sale and leaseback of every asset in the company. During this time, our chief financial officer and I traveled throughout the world — from Geneva, Switzerland, to Geneva, Wisconsin — often to meetings in as many as three cities per day.

It left an impression. When it was accomplished and there was time to think back on those events, I came to realize that fundamental changes had occurred which demanded different strategies for new high-technology companies such as ours.

In discussing this broad area, I will describe:

a. Some of the changes and discontinuities in events that have occurred.

b. The resulting concentration or narrowing of the capital markets and the consequent effect on new high technology companies.

c. Some nontraditional sources of financing that should be considered.

d. And a framework which I find useful for moving through this thicket.

THE AGE OF DISCONTINUITY

In 1969, Peter Drucker coined the phrase The Age of Discontinuity to refer to the coming decade of unprecedented change brought about by genuinely new technologies, the rise of a world economy, social change being managed by large institutions, and an explosive spread of knowledge.

One year later, Alvin Toffler popularized and expanded upon this theme in *Future Shock.*

In 1975, Dr. Michael Kami in his *Manual of Management Assumptions for Planning Business Strategies* provided a framework for operating a business during a time of increased complexity and significant economic and social changes.

Important changes that Kami identifies include:

1. *Economic*

A) Classical Economics are Obsolete
—old rules and formulas don't work (but government policies still seem to be based on them, e.g., in 1974, we saw high unemployment and high inflation; high inflation and deep recession — prices didn't fall during a recession)

B) Increased economic Power of Large Organizations
—creates two-tier economy, each with different characteristics
—large businesses
—large unions

C) New Plateau of Energy & Raw Materials Costs
—changes price structure of products and services
—redistribution of wealth

D) Low Labor Productivity
—changes real growth of national output
—wages based on inflation, not productivity gains

E) Chronic Inflation
—major economic and social danger

2. *Social*

A) Slower Population Growth//unpredicted in 1972
—affects economic growth
—changing age distribution affects demand for goods and services

B) New Values — changing priorities

C) Rise in Crime
—in the streets//affects lifestyles
—corporate//affects confidence in our established political and business institutions

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D) Consumer Power and Demands

—increases business costs for antipollution, safety, and health protection

3. *Governmental*

—increasing trend toward regulation and intervention in business; OSHA, FDA, EPA, Consumer Product Safety Commission, SEC, ERISA — stretches everything out: business must be able to withstand the delays

—government managing social change

—huge deficits have new economic impacts

4. *International Interdependence*

—OPEC countries created new international balance of economic power

—World market/new opportunities; new competition; new problems as nationalism clashes with realities of world market

—Political unrest increasing

What we can expect from this is that the period of continuous economic growth is ended. The Go-Go decade is over. In its place, we are living through a time of change, of discontinuities.

Business must adapt its strategy to this new reality.

First to recognize the impact of these changes were the economists. But it took considerable time, for economics is a strange science. I am a chemist by training and in chemistry when the data do not agree with the theory, the chemist throws out the theory. For too long in economics, when data and theory did not agree, economists continued to throw out the data. There were too many "exceptions that proved the rule".

Next were the marketing people. They came around when they could no longer sell products.

After them, came financial managers. The period of capital starvation of 1974 and 1975 taught them lessons about the value of financial flexibility and liquidity. This change can be seen clearly in the present business upturn. Companies are emphasizing their liquidity and little borrowing is taking place, which is very unusual. This, by the way, presents an opportunity for newer companies since banks are more anxious to do business today.

Last were top managements, who have the responsibility of identifying and managing the strategic factors affecting their businesses. During the 1950's and 1960's, when a growth strategy was the right one, top management tended to come from the high-growth areas — marketing, technology. Many of these people were ill-equipped for the 1974-5 discontinuity. In the future, we may see more financially oriented executives running companies, as that orientation is needed now.

Financial Function Changed

In business, the financial function has changed. It is no longer a job for the controller. It is now a key strategic factor for success. As such, it must occupy the Chief Executive Officer.

These changes, and their effects on business strategies, apply to all firms. There are strategic implications for new companies developing new technology.

To begin, let's review the traditional sources of financing for new high-technology companies and what has happened to them.

First, it must be recognized that development and commercialization of new technology takes time. It always has:

11 years for the electric typewriter.

12 years for xerography.

10 years for color television.

And how long has always been uncertain. With increased and changing government regulation and consumer power, the uncertainties have increased.

Essential to success is management commitment. Technical capability and resources are required, of course. But the key raw material for technology development is money. For money provides staying power during a development stage of uncertain duration.

During the 1950's and 1960's money for new companies pioneering new technology was abundant. The proven financing formula was:

a. Founders form company, buying promotional stock at low price.

b. Small piece of the company is then sold to venture capitalists at a higher price.

c. If technical accomplishment was good, a second round of private venture capital financing might be obtained at a still higher price.

d. Then further financing obtained through a public offering.

e. Founders and venture investors cash-out through a secondary offering to the public.

Successful high-technology companies were formed and financed in this manner.

In the 1960's, many people did this with great success and don't need to work in the 1970's. Others who tried it in the 1970's, aren't working now either. They are collecting unemployment.

These traditional sources of financing have changed. With it, management must change its financing strategy.

EQUITY MARKETS

With increased uncertainty in the environment, investor risk profiles have changed and become more risk averse; which resulted in the following:

—Reduction in the time horizon which investors were willing to hold investments to get their required return.

—Increase in pressure for liquidity.

—Focus on yield, i.e., short-run cash returns during holding period.

—Demand for investment quality, i.e., stability.

The symptoms of these changes were then reflected in the capital markets.

(A) Poor Performance of the stock market has made investors very cautious and tended to close the public equity markets to new issues:

—In 1965, the Dow Jones Average was 900. Adjusting for inflation and the erosion in the purchasing power of the dollar, it would have had to be 1500 in 1975 to be even.

(B) Main source of investment capital has shifted to private pension plans and other managed capital pools.

—Capital formation and equity investments have moved from entrepreneurs who invest in the future to trustees and administrators whose duty it is to invest in prudent investments, and who are paid salaries and do not derive benefits of gains but who can be fired for mistakes.

—ERISA puts more emphasis on caution.

(C) These forces also have tended to restrict the private equity placement markets to only a few high-quality issues.

D) Legal and accounting changes have restricted access to these markets as well as making entry into them both more cumbersome and more expensive.

—Corporate Securities Rules in California (260.140.05) may preclude public offering if the company's business operations depend upon the development of a product which will not be completed before the offering.

—Went into effect May 10, 1973, just before equity markets closed to new issues (the oil embargo was October 1973) so never litigated.

—But was used administratively to prevent offering of shares in company formed by Mr. Lear to develop a steam-powered car.

VENTURE CAPITAL

Changes in public equity markets, which affect timing and size of returns to early investors, have changed their investment criteria; (a) they must see a way to liquidate investment in a manner other than public offerings causing sharp reduction in investments made; and (b) they must be prepared to keep portfolio companies afloat in difficult times causing a reduction in initial size of commitment.

Venture capital money now tends to go into: (1) unplanned investments in firms previously financed by the venture capital firm — but now denied access to other sources of capital; (b) mature companies ($10 to $50 million in sales) to whom public markets are temporarily closed; (c) purchases of stock in public corporations selling below book or liquidation value; (d) new, low-technology companies (restaurants, natural resource companies) where ability to reach break-even cash flow is clearer even if the result is not "spectacular"; and (e) leveraged buy-outs of established companies.

DEBT FINANCING

This area is dominated by commercial banks, and as with other forms of financing, it has drastically changed over the past few years.

—Banks are becoming more quality than volume oriented, making bank credit more difficult to obtain.

— They are more reluctant to continue lending when there are problems.

—Medium-size companies ($20-50 million in sales) with long-established bank relationships were cut off in 1974 and 1975.

—Banks are becoming more active in companies, especially when there are problems, e.g., Bank of America in Memorex.

—Public interest groups and regulatory authorities are scrutinizing loan activities more carefully than ever before.

As a result, smaller, newer companies have a more difficult time securing bank credit, even with considerable "debt capacity" as viewed by traditional standards.

I am not saying that these traditional sources should be ignored. For there will be periods in which they are available; we now are in such a time. And that is the time to act, to inventory money, as one of my directors likes to say. We at Dynapol did that last year, by raising $4 million from private investors. What I am saying is that a financing strategy based solely on them is very risky, well beyond my own risk profile. For you cannot rely — as you could in the 1960's — on these financing devices being available when you need them, even though your internal progress toward important goals is outstanding.

Given that the traditional financing sources have changed, management's strategy must change as well. Other, less traditional sources of financing new high-technology companies must be sought. Let's review some of these sources.

ARRANGEMENTS WITH FUTURE CUSTOMERS

Many large businesses have depended on suppliers to develop new technology to meet the end-users needs. When capital was plentiful, the customer tended to look at technology development as his supplier's problem. More recently, as the suppliers have ceased making substantial investments in new technology, the customers have recognized a strategic interest in the solution to certain technical problems.

This represents a source of financing for new high-technology companies.

In implementing this approach, begin by identifying the firm that has the most to gain by your technical success. It may be the market share leader, the principal innovator in the field, or even someone anxious to enter the business. That is the firm with the highest motivation to finance the development.

It is also helpful to find the leverage point provided by your technology. For example, in our industry, $4 million in sales of the dye, Red No. 2, supported $10 billion in sales of foods. When the dye was withdrawn by the FDA, it was the food industry's problem, not the dye supplier's. This is only now being recognized.

In any financing transaction, one must weight the benefits against what is given up. My experience is that entrepreneurs tend to concentrate too much on the sharing of the pay-off and not enough on increasing the probability of getting there.

Examples

1. Amdahl Corporation, developer of the 4th generation computer, was financed in part by Fujitsu of Japan which committed to buy the then yet-to-be manufactured machines. This later evolved into a broader participation by Fujitsu in Amdahl.

2. At Dynapol, we have funded our program to develop a nonabsorbable, nonnutritive sweetener through an arrangement with a major soft drink company that received options on our production. Through this we received both financial support and a close working relationship with the team of flavorists that will decide which ingredients go into that firm's products.

ARRANGEMENTS WITH COMPANIES WANTING TO ENTER FIELD

With capital expensive, many major corporations are de-emphasizing long-term research in favor of improving the return on the assets in their current business. The cover story in *Chemical and Engineering News* of December 15, 1975 quotes the research directors of DuPont, American Cyanamid, and Celanese to this effect.

This has created a new receptivity to technology originated outside of the company. Joint ventures of other kinds of arrangements with major corporations are a good source of technology funding.

For example, Tyco Laboratories is developing its technology to make solar cells from silicon ribbon through a joint venture with Mobil Oil. According to *The Wall Street Journal* of January 2, 1975, Mobil will invest up to $30 million through 1980-82 in the venture.

INTERNATIONAL RIGHTS TO TECHNOLOGY

Arrangements with companies interested in marketing, and even manufacturing, your product abroad can be a source of financing during the development stage.

Some governments provide financial incentives to local companies to acquire important new technology. Canada and Italy are examples.

As an example, ALZA Corporation obtained $10.5 million in financing during its development stage from European pharmaceutical companies which received certain rights to ALZA products in their countries.

Usually, these approaches will require that you deal with large companies. A few words about that may be helpful.

First, start at the top with your initial contact. Reach as high into the organization as you can. If you have selected a firm which truly stands to gain from your success, top management should be willing to meet with you. I have found that outside directors, lawyers, accountants, bankers, and investment bankers are delighted to provide the introduction.

Second, be prepared for repeated meetings with people at all levels before the deal is closed.

Third, understand that it will take time. My rule of thumb is one year for a major deal. So you must start early and have the financial staying power to see it through.

ACQUISITION OF A PROFITABLE RELATED BUSINESS

Today, if I were the inventor of a new product of great potential but requiring a sizable investment to reach the market, I would finance its development through a leveraged buy-out of a related business. Profits from this business can be used to cover the product development costs and provide the staying power through the uncertainties of research and development. And the acquired business can also serve as the future operating base for your company.

Through the acquisition of a profitable, related business, a new high-technology company can obtain:

a. Cash flow to cover development costs of its technology.
b. Marketing channels.
c. Manufacturing assets and capability.
d. Size needed to have access to public equity markets.

Today, financing for such acquisitions is available from venture capitalists, banks, and insurance companies. Often, these buy-outs can be done on a highly leveraged basis. And you can acquire something far larger than you may think through the use of leverage.

In this new mode of business start-up, your acquisition criteria will differ from those of the past. Instead of growth potential, you will be interested in cash-flow from a mature, stable firm. The growth will come from your technology.

Zoecon, which is pioneering the development of hormonal insect control agents, has financed itself largely through the acquisition of Thuron Industries six years ago.

SALE AND LEASEBACK OF ASSETS

Lastly, I want to mention something often overlooked. This is the sale and leaseback of assets owned by your company. When you really need money — to buy time to close on one or more of these other approaches — this source can be available. Since the buyer will be a secured lender and you will be insensitive to the interest rate, money usually can be obtained in this way.

In financing new technology in new companies, one must follow multiple approaches. Those that I have discussed include venture capital, bank debt, arrangements with future customers, arrangements with firms wanting to enter the field, selling international rights, acquiring a profitable related business, and the sale and leaseback of assets. Each has its place in your strategy.

By nature, only optimists start new ventures. This is particularly true of ventures aimed at developing important technology. My message is that in this decade one must be neither *optimistic* nor *pessimistic* but instead *realistic.*

Financing is a key strategic factor in every new high technology company. The rules for getting it have changed and will continue to change. My conclusions for management are:

1. By all means, have a 3-to-5-year plan — but be prepared to change it as the assumptions on which it is built change.
2. Be explicit about the important assumptions — both as to internal progress and external conditions — on which your business and financing plan is based.
3. When an important assumption changes, change your decisions and approach if needed.
4. Recognize the favorable discontinuities and be opportunistic. You must plan for the critical business discontinuities that effect your business.
5. All important, do not rely on a single source of financing. Follow multiple approaches. Be flexible. Be fast when opportunities are presented

The message is paradoxical: Today you must be prepared for the unexpected.