

The Open Corporation

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In a recent article, Peters addresses the problem of maintaining a culture of innovation in American corporations.¹ What can we do, he asks, other than “let our big firms twist slowly in the wind” while we await the next generation of entrepreneurial start-ups? He goes on to propose a number of remedies that make excellent sense for companies seeking to foster innovation.

However, I don't believe that the problem is a shortage of innovation. America continues to be rich in this arena. Many of our large corporations have research laboratories that generate marvels of science and technology. Our research universities are the envy of the rest of the world. The main problem has been in moving innovation to the market. There seem to be innate features of our large companies and universities that make them inefficient mechanisms for commercialization of innovations.

One need only consider examples from the electronics and computer industries to perceive this inefficiency. Some of America's largest companies were unwilling or unable to commercialize such revolutionary innovations as the transistor, the UNIX operating system, reduced instruction set computing (RISC), relational databases, flat-panel displays, video tape recorders, and user-friendly personal computers. In each case, a research laboratory of one of these companies brought the innovation into being; and in each case, the development of large markets was left for others, usually American entrepreneurial start-ups but sometimes large Japanese companies.

I thank my many colleagues at Teknekron, past and present, who have participated in its growth and through whom the open-corporation model has grown to maturity. I am particularly indebted to Stephen Leavitt, Michael Thomas, and George Turin for helping me articulate my ideas in this article.

Large American corporations have failed to commercialize not only breakthrough technologies, but, in many cases, more mundane (“follow-through”) innovations, especially when they seemed unrelated to the “real” business of the firm. The intermediation of an “innovations transfer” force—some sort of catalytic agent—between the company’s research laboratory and its product divisions was missing.²

American universities likewise have had great difficulties coping with the innovations-transfer process. They have spent the last decade trying to balance their traditional responsibility for the production and dissemination of knowledge with a more recently perceived responsibility to make that knowledge productive for society. Despite the burgeoning of university technology-licensing offices, an effective catalytic agent proactively connecting innovation source (the university) and innovation user (industry) has largely been lacking. The focus has rather been the sale of “intellectual property.”

I believe that the problem is structural. Big corporations in America are structured to be good at other things than innovations transfer, even from their own laboratories. They address huge, worldwide markets with evolving sequences of products. They therefore must have international sales, production, and distribution and maintenance channels; and they must be good at developing and marketing incremental improvements in their product lines. The very structure, often bureaucratic, that makes them so good in that domain makes them extremely inefficient in addressing small markets and in handling substantial innovations. And universities are not structured to address any markets at all; little wonder that they have difficulty with commercialization!

I confess to being one of the “entrepreneurialism fanatics” Peters mentions in his article.³ I think that Peters is correct in implying that most significant innovations in America are commercialized by entrepreneurs. The trouble is that standard entrepreneurial mechanisms have a different sort of inefficiency than large corporations and universities in the innovations-transfer process: only about one in ten high-tech start-ups succeeds, leading to a prodigious waste of technological, capital and human resources.⁴

I discuss here another model for fostering and marketing innovation, involving what I call “the open corporation,” which in structure is a middle ground between the large company and the small start-up. The open corporation provides a platform on which the three key elements of innovations transfer—innovation sources, “catalytic” entrepreneurs and innovation users—combine their efforts to accomplish the transfer process. The platform is sustained within an existing corporate structure, purposely kept small enough to prevent the encroachment of an entrepreneur-killing bureaucracy but large enough to give the entrepreneurs immediate corporate substance, credibility, and stability. Almost paradoxically, as the open corporation grows, it offers more and more opportunity for new generations of entrepreneurs.

The open-corporation model grew from my and my colleagues' efforts in starting such a company in 1968. Some of us came from large companies, others from academia, but we were all frustrated by the closed cultures that seemed inescapably to grow in these institutions. We sought a mechanism that opened those cultures, even linked them, through the catalyst of entrepreneurship. Our company, Teknekron Corporation, has grown more than 2500-fold since then, but it has not succumbed to the inertia or closedness that we sought to avoid, and it remains as entrepreneurial today as when it started.

In order to explain the model, I will start with a metaphor drawn from—of all places—cosmology. Then, dipping heavily into my own experience, I will describe the structure of the open corporation, how it guides entrepreneurs to success, and how it transfers technological innovation into the marketplace.

The Universe According to Hoyle

In the late 1940s, British astronomer Fred Hoyle and two of his colleagues astounded the scientific world with a new cosmology postulating the continuous creation of matter. They were attempting to resolve the following paradoxical observations and conclusions:

- All galaxies in the universe are rushing away from each other with ever-increasing speeds. From any point in the universe there are distant galaxies receding so fast that they can never be observed.
- Intergalactic matter is constantly coalescing to form new galaxies amidst the receding ones.
- If this process has been going on for all eternity (which Hoyle took as a more palatable hypothesis than the “Big Bang” theory, in which the universe seems to have started 10-20 billion years ago), then:
 - Why can we see any neighboring galaxies at all?
 - Why has all the intergalactic matter not been used up already?

Hoyle's answer was that matter is continuously being created everywhere, out of nothing, this creation in fact driving the expansion of the universe. Matter is created, new galaxies coalesce and older galaxies move away, all at a rate that makes the universe look pretty much the same at any time and at any place. (Hoyle's cosmos thus came to be known as the “steady state” universe.) To critics who scoffed at the idea of continuous creation, Hoyle replied, “Better continuously for all time than all in a flash at a single instant.”

Unfortunately for Sir Fred, the Big Bang theory seems to explain observed phenomena better than the Steady State theory, and the former is now generally accepted.⁵ But Hoyle's model serves as an excellent metaphor for the open corporation.

Continuous Creation of Enterprises: The Open Corporation

Entrepreneurial companies are continuously faced with the following problems:

- How can rapid growth be sustained?
- How can innovations transfer and entrepreneurship continue to be encouraged and rewarded as the company ages?

As Peters points out, companies long removed from their entrepreneurial roots need to grapple with and solve similar problems.

Successful companies typically offer fewer rewards to employees who join later than to those present at creation, at the “big bang.” There can be only a few founders, only one president, only one chief engineer. As the company ages, it becomes harder and harder to obtain a substantial share of equity. The young and entrepreneurial often decide to move out instead of up, and their talents are lost to the company. Silicon Valley is a testimony to this process, generation upon generation of start-ups having been spawned from aging companies in the past two decades.

Some traditional corporations have tried to stanch this flow by “intrapreneurship,”⁶ the support of new ventures within the corporation. These ventures are often based on research in the corporation’s research laboratories; the intrapreneur is sometimes the researcher, who seeks an opportunity to be the instrument of commercialization. Perhaps because the entrepreneurial culture wanes as a corporation gets older, larger, and more bureaucratic; perhaps because intrapreneurs who need the safety net of a large corporation may not have the will to succeed at all costs; perhaps because researchers may not be good intrapreneurs; perhaps because intrapreneurial rewards are not great enough; for whatever reason, intrapreneurial efforts by large corporations have mostly not succeeded. They have certainly not been major contributors to corporate growth.

In contrast to the more traditional company, the open corporation stimulates both entrepreneurship and innovations transfer, rather than being threatened by them. Identifying and nurturing entrepreneurs and connecting them to sources and users of innovation are the open corporation’s *raison d’être* and the main driving force of corporate growth. Such a corporation is structured to motivate entrepreneurs’ personal and professional growth and to enforce their connectivity to sources and users of innovation.

The open corporation’s structure is like that of Hoyle’s universe. The corporation continues to expand, but also seems the same to every new generation of entrepreneurs inhabiting it—it never gets too big or bureaucratic, and entrepreneurial rewards always remain available at the same high levels. New entrepreneurial units are constantly being created “out of nothing,” like new matter in Hoyle’s cosmos; the creation of these units in fact drives the expansion of the corporate whole. As units age, they become

corporate entities (newly coalesced galaxies) themselves, affiliated with the parent corporation; they then “recede” from (become more independent of) each other and from yet newer units, allowing room for all to develop. Ultimately, the older units are spun out of the open corporation entirely by sale to more traditional companies or to the public (just as very old galaxies disappear from our observable universe), thus keeping the parent open corporation perpetually young.

The spin-out of an affiliate to a larger company can be an additional method (not listed by Peters in his article)⁷ for injecting innovation into the acquiring company. For, while the spin-out is mature within the open corporation’s universe, it adds an element of youthful vitality to the acquiring company. The spin-out’s technologies and people can help rejuvenate the older company and introduce the latter to markets too small for it to have addressed easily.

I will not stretch the analogy with Hoyle’s cosmos further. In order to make some of these concepts more concrete, I will now focus briefly on Teknekron, of which I am CEO, chairman, and founder. While Teknekron has confined itself to a particular high-technology market sector, I believe that the lessons that my colleagues and I have learned have more general applicability.

Teknekron Corporation

Teknekron Corporation was founded in Berkeley, California, in 1968. The founding group consisted of engineers from the University of California and industry who had worked on computer and communication systems. Because of our backgrounds, Teknekron has concentrated on information technology—anything to do with the acquisition, communication, processing, display, storage, and industrial or commercial applications of information.

Early on, it was decided not to build a monolithic company, but to establish a vehicle for the continual creation of new ventures in which new entrepreneurs could succeed. Teknekron’s main functions would be to seek entrepreneurs; help connect them to sources and users of innovation; teach them the elements of business that they might not know; nurture them during their learning period until their efforts stabilized; launch their units as affiliated companies so that they could achieve further growth independently; and finally spin the affiliates out by public or private sale when they were fully matured and too big for continued affiliation with the parent. In addition to supervision of the growth of the new enterprises, Teknekron would perform corporate services best accomplished as a group (such as employee benefits, insurance, and legal matters).

Teknekron was purposely to be kept very lean so as not to impose a weighty bureaucracy on the family of affiliated companies. Even today, its staff consists of fewer than fifteen people, not including entrepreneurs in their start-up stage.

New Teknekron ventures do not take the traditional course of developing, from the outset, a standard product for the end-user market. Instead, they concentrate on developing products for inclusion in other, generally larger companies' product lines, and on delivering customized integrated systems for such companies' internal use. It is only after years of working with client companies on specific projects that a Teknekron enterprise might condense its market-honed technologies into generic "core products." This market approach has distinguished us from venture-capital partnerships, which tend to focus on funding companies that *ab initio* develop products for the end-user market.

Teknekron always attempts, by fostering very close relationships with researchers in universities and other research institutions, to be on the cutting edge of technology; these researchers are major sources of innovation for our enterprises. However, Teknekron is more pulled by demand than pushed by technology. The corporate philosophy holds that no matter how attractive a technology is *as technology*, it has no value until it has been successfully sold. Marketing efforts therefore concentrate on discovering within client companies those problems that can be solved technologically, and on bringing appropriate technology to their solutions. This philosophy enforces the role of the Teknekron entrepreneur as a catalyst in the innovations-transfer process, connecting source and user of innovation to solve the user's problem.

Because of their problem-solving approach, Teknekron companies tend to focus vertically on industries. Each company has found niche markets in industrial sectors where a combination of a detailed understanding of the requirements of the industry and of technology can be put to work in problem solving. The viewpoint is always the client's: "How can my problem be expeditiously solved, with benefits far exceeding cost?" If that question cannot be answered, technology is superfluous.

Teknekron has thus provided the platform on which innovation sources (researchers in universities and other research institutions), innovation users (client companies), and entrepreneurs can work cooperatively to move innovative technology from source to user in a real-world context. By combining these three elements, Teknekron has sought to break the closed-culture pattern its founders had seen in industry and academia. It is a truly open corporation—open to entrepreneurial talent, open to technological innovation, open to market needs.

Since 1968, eleven affiliated companies have been formed, serving such varied markets as energy utilities, commercial and investment banking, transportation, communications, and insurance (see Table 1). Four of these companies have been spun out by private or public sale, one was disbanded, and the remaining six are still privately held affiliates that are growing within the open-corporation structure. About a dozen start-up units never achieved affiliated-company status, and there are presently four in various stages of growth toward this status. Thus, Teknekron's success rate in

Table 1. The Teknekron Companies

Since 1968, Teknekron has created eleven affiliates. Ten of these were start-ups within Teknekron's open-corporation framework, the eleventh an acquisition. Each affiliate has focused on one or more vertical markets, bringing customized, leading-edge technology to the solution of client problems. The markets given below are the primary markets of the respective affiliates.

Insurance Technology Company

Market: Insurance industry
Start-up: 1969
Affiliate: 1971
Disbanded: 1980

Tenera, L.P.

Market: Energy utilities
Start-up: 1972
Affiliate: 1976
Went public: 1982

Integrated Automation, Inc.

Market: Factory automation
Start-up: 1972
Affiliate: 1979
Sold to Litton Industries: 1987

Teknekron Financial Systems, Inc.

Market: Banks and credit-card companies
Start-up: 1975
Affiliate: 1978
Sold to TRW: 1986

Software Alliance Corporation

Market: Commercial banks
Start-up: 1981
Affiliate: 1983

Teknekron Transportation Systems, Inc.

Market: Transportation companies
Start-up: 1982
Affiliate: 1986

Teknekron Communications Systems, Inc.

Market: Telecommunication providers and users
Start-up: 1983
Affiliate: 1987
Went public: 1991

Teknekron Infoswitch Corporation

Market: Call-distribution centers
Acquired from Datapoint Corporation: 1983
Affiliate: 1983

Teknekron Software Systems, Inc.

Market: Securities industry
Start-up: 1985
Affiliate: 1987

IEX Corporation

Market: Telecommunication common-carriers
Start-up: 1988
Affiliate: 1988

Teknekron Sensor Development Corp.

Market: Biological/chemical/mechanical sensors
Spun out of SRI International: 1989
Affiliate: 1989

forming successful companies from the start-up phase is about 50%. This success rate—about 4-5 times that normally expected for a high-technology start-up—is at least in part due to a unique start-up technique.

The start-up methodology encompasses all three cooperative elements previously mentioned: entrepreneurs, innovation sources, and innovation users. Molding them into a successful business operation requires intensive programs of action.

Guided Entrepreneurship

A primary element of the start-up methodology is the training of entrepreneurs. In addition to having a deep understanding of the characteristics, strengths, and weaknesses of the would-be entrepreneurs to be sought, the open corporation must be able to guide them through the minefields of the start-up process.

“Guided entrepreneurship” seems at first to be a contradiction in terms. One wants to attract innovative, fire-eating, risk-taking dynamos who have visions of creating, out of nothing, an enterprise that will ultimately have a market value of hundreds of millions of dollars. Guiding them to that end seems almost literally to be a case of grabbing a tiger by the tail: can one do it without destroying oneself or the tiger or both? I have found that the best entrepreneurs know their shortcomings, at least intuitively, and willingly listen to and act on advice while reserving the right to reject it.

As indicated by the growth sequence outlined in analogy to Hoyle’s universe, I believe it a mistake to start a new venture as a separate corporate entity within the framework of the open corporation. Newly created intergalactic matter must first coalesce into a galaxy. To start as a corporation misleads everyone—the entrepreneurs and the corporate staff—into believing that the venture has attained the maturity, judgment, and stability that one associates with a going concern. Without revenues, profits, and backlog, without an understanding of infrastructure functions (such as accounting, personnel search, and contracts), calling a few people a corporation is something like giving a twelve-year-old the keys to the car. He may look like he can drive it, but it is fairly certain what will happen.

Rather, I am convinced that new entrepreneurs should be led through a series of achievements that successively give them more autonomy and control. They must prove by accomplishment that they can achieve profitable revenues, sustain a backlog, hire first-rate people, expand their market, and manage growth. Ultimately, by virtue of performance rather than expectations, they achieve the independence of a corporate affiliate. Moreover, the transition from start-up to affiliate is most effectively guided by a structured training program.

The open corporation therefore becomes a school for entrepreneurs. New matriculants become employees of the corporation with a single charter: to develop a line of business that rapidly becomes profitable and then grows to the stability required for a separate corporate entity. While “in school,” they learn both from a formal corporate training program and—perhaps more importantly—from peers who are or have recently been at the same stage of development.

At Teknekron, a start-up usually comprises two entrepreneurs. They are typically quite young (perhaps a year or two from their most recent degree), have a strong grounding in leading-edge technology, and have already shown signs of being winners. While both are technologically based, the

pair is optimally a balance between an “outside,” sales-oriented person and an “inside,” projects-oriented complement. Because of their youth, they are often quite naive about the elements of business. From their backgrounds, they may already have knowledge of saleable technologies and at least vague ideas about where the market for these technologies may lie.

When the new entrepreneurs are hired, their first indoctrination is in the elements of marketing and sales. A target market segment related to the entrepreneurs’ background and interests is selected, and members of the corporate staff help establish a market focus and accompany the entrepreneurs on a number of initial sales trips. This “learning by doing” is supplemented by tutored viewings of video tapes prepared by corporate staff and by entrepreneurs who have successfully graduated from the Teknekron “school.” These tapes try to pass on the experience of one generation to the next.

The initial focus on marketing is an essential element of the open corporation, because it immediately connects the entrepreneur to a user of innovation—the client company. In my view, developing a system or product without immediate and ongoing contact with its user runs the strong risk of encouraging closedness at the very outset of a new enterprise’s life.

Other elements of the training program involve tutelage on such things as negotiating contracts; assuring completion of projects to the client’s satisfaction and at a profit; hiring talented personnel and motivating them; and working with a controller. These elements should be learned in a staged sequence, as needed. By the time the initial entrepreneurs have graduated from “school,” they have grown their unit to 20-25 people and are ready to spin out to affiliate status. I will return to this later.

Sources of Innovation: The Connection to Academia

At the outset, I stated my belief that America’s competitiveness problem does not derive from a lack of technological innovation, but from difficulties in moving that innovation to the marketplace. We have seen that the open corporation helps connect its entrepreneurs to the market. It must also connect them to sources of innovation.

There are three major sources of scientific and technological innovation in America: the research laboratories of large corporations (e.g., AT&T Bell Laboratories), the not-for-profit research laboratories (e.g., SRI International), and the nation’s research universities. How to transfer technology from these institutions into the marketplace has become a major issue of national concern. Large corporations have agonized over the disconnection between their R&D labs and their operating divisions. The not-for-profits and universities have been under increasing pressure, often from the federal government, to put their research results to work for the economy. I believe that the open corporation can effectively work with each of these sources of innovation.

At Teknekron, we have indeed interacted with all three sources. We have

worked jointly with the research labs and operating divisions of client companies to expedite the development phase of a product based on an innovation in the research labs. Additionally, we have discussed with major corporations methods by which innovations in their R&D labs can be introduced to “tiny markets”⁸—markets of less than \$50 million in annual revenues that would be too small for the large corporation to enter. (Teknekron’s start-up mechanism would be used, and we have envisioned the possible later return of the mature technology and market to the larger company, a sort of two-way spin-out.) In connection with not-for-profits, one of our companies is a spin-out from SRI International; Teknekron provided a vehicle for SRI and some of its technical staff to move their research innovations to the market, and SRI became an equity partner. But universities have been by far our most fertile source of innovation.

Our origins in Berkeley were no accident. We saw the University of California campus there as a mother lode of innovation that had not been mined, as had MIT and Stanford. We immediately created ties to the UCB faculty (two of the founding group were faculty members at UCB), and these ties have subsequently grown at UCB and many of the country’s major universities.

We realized early that our direct links to faculty members at a university were much more fruitful than those to the university’s office of intellectual property. Intellectual property, as encapsulated in patents and copyrights, is just that: encapsulated, and lacking the vibrance of the intellect behind the property. “Intellect, not intellectual property” therefore became a rubric for us.⁹

Our connections with academics range all the way from the usual consulting relationships to the concept of the “academic principal.” That concept exploits the natural symbiosis between an academic who wants a relationship with the “outside world” and an entrepreneur who needs a connection to a source of innovation. We try to “marry” the entrepreneurs in each start-up with one or more compatible academics, who become academic principals of the new venture. The academics become the source of innovative ideas, means to establish relationships with officers of potential client companies, and sources of referrals of former students who might themselves be entrepreneurial. The entrepreneurs become a way for the academics to remain academics, yet see their ideas reach practical applications. Academic principals get equity in the ultimate affiliated company.

I am certain that, through this concept of academic principal, we have discovered a way to transfer technology from the university efficiently without compromising the essential academic role of the professor.

Users of Innovation: The Corporate Client

The final element of the start-up methodology is the involvement of the user of innovation in its commercialization. As I’ve said, many new enter-

prises lack this element, I believe to their peril. While they are connected to innovation sources through their entrepreneurs, they often “go into the back room” during the development cycle, only guessing what the innovation user needs. But building a better mousetrap is valueless if no one has a rodent problem.

The immediate and intimate relationship with the innovation user so frequently yields unexpected results that they are no longer a surprise to us at Teknekron. Most often, the entrepreneur finds that no one needs the technological innovation that has mesmerized him. The client may say, “I like you as a person and as an entrepreneur, and your technology is fascinating, but it doesn’t solve my problem. How about. . . .” He then goes on to list problems that he really needs to solve. Thus enlisting the innovation user in the innovations-transfer process reduces the probability that the entrepreneur will miss the market. This is why I have stressed that the open corporation responds more to market pull than to technology push.

Reprise: The Value of the Open Corporation in the Start-Up Process

By creating a platform for innovations transfer, the open corporation helps all three cooperating elements of the process. The entrepreneurs become part of a sizable, experienced and recognized company, so they do not fall to the “small-company syndrome”; clients are assured of their business stability. The entrepreneurs also receive schooling in entrepreneurship, thus avoiding many of the pitfalls they might have encountered were they to go it alone. Researchers, on the other hand, can participate in the commercialization of their innovations without having to become entrepreneurs themselves. Finally, large companies, which for structural reasons have difficulty in innovations transfer, find a viable mechanism with which they can work cooperatively for their own benefit.

Affiliates of an Open Corporation

When the entrepreneurs and their now-many colleagues have graduated from the school for entrepreneurs, they are ready for the corporate stage. An affiliate of the parent open corporation is formed. And, just as a new galaxy immediately starts to recede from other galaxies and eventually leaves the observable universe, the new company begins a path involving more and more separation and eventual spin-off from its sister affiliates and the parent company.

The affiliate’s officers now have a new course of learning to master. Roles become much more specialized than in the start-up phase, when everyone was called upon at times to do everything. The start-up unit’s director becomes company president, and must learn to delegate more and more

authority and responsibility, while keeping tight control over the growth and performance of the company. To do this, he or she must learn to work more through corporate staff: an executive vice president, a controller, a personnel officer, project leaders, eventually division directors. The president's reporting relationship to the parent corporation changes from that of employee to one in which he reports to a board of directors controlled by the parent.

In my experience, growth of the affiliate from formation to spin-out best occurs in two stages. In the first, the president is chief operating officer but not chief executive officer, the latter title residing with the chairman of the board, who is an officer of the parent company. In this stage, much of the strategic planning for growth is done through close, frequent contacts between the two. Further disengagement from the parent occurs when revenues and profits cross prescribed levels, at which time the president becomes chief executive officer. More growth involves yet more delegation of responsibility by the president to (now multiple) lower levels. The CEO/president must conquer the problems of growing competition and preparation for spin-out from the open corporation.

Spin-out by private or public sale is the event that transforms "sweat equity" into liquid assets. It is the major entrepreneurial reward sought by all. The decision concerning when to achieve liquidity is made jointly by officers of the parent and affiliated companies.

Entrepreneurial Rewards

Although I have spoken much of creating a corporate structure that will attract entrepreneurs, I have not yet discussed entrepreneurial rewards. These rewards must go beyond the salary, bonus and fringe benefits that can be obtained in traditional companies; they must recognize a variety of economic and psychological achievements that are the complement of successful entrepreneurship.

The economic reward is easily defined. It is the attainment of financial independence—simply put, having sufficient assets in municipal bonds so that one's economic requirements are satisfied by "coupon clipping." This reward occurs at the time of spin-out.

Psychological rewards involve achievement of power, control and legitimacy; recognition by a community of like-minded entrepreneurs; and so forth. These non-economic needs are often harder to satisfy than economic ones, because criteria for measuring when the reward is earned are not as easily quantifiable. For example, the entrepreneur's need for power and control could prematurely push the open corporation into giving him so much autonomy that his very survival is risked; but denying some measure of independence at the early stages would blunt his drive and his development of business judgment.

The major lesson we have learned in reward-giving sounds so obvious that one wonders whether it should be stated at all—until one observes how frequently it is violated. It is simply that all rewards should follow performance, not precede it. Most parents recognize this truth; it is surprising how few of us follow it.

One of the rewards most in contention is the granting of equity. Virtually all entrepreneurs want to own equity in their ventures from the outset. The problem in allocating it then is that there is no rational way of measuring who will earn it. I believe that even initial allocations of equity should await the attainment of affiliate status. At Teknekron, the only pledge made at start-up is that a prescribed fraction of the affiliate's stock will be reserved for staff members of the affiliate, some distributed when it is formed and the rest held for reward for future performance.¹⁰ Who gets how much is a judgment made retrospectively, not prospectively, and is made by the affiliate's president in consultation with its Board. Teknekron has established guidelines, based on its experience, for how much equity normally will be awarded to those who occupy various key positions.

At Teknekron, other entrepreneurial rewards, such as obtaining more control over the unit's fate, are given on the attainment of various levels of revenues and profits, as discussed above. The objective of the open corporation is to withdraw gradually from effective operating control as the entrepreneurial unit shows increased maturity, revenues, and profits.

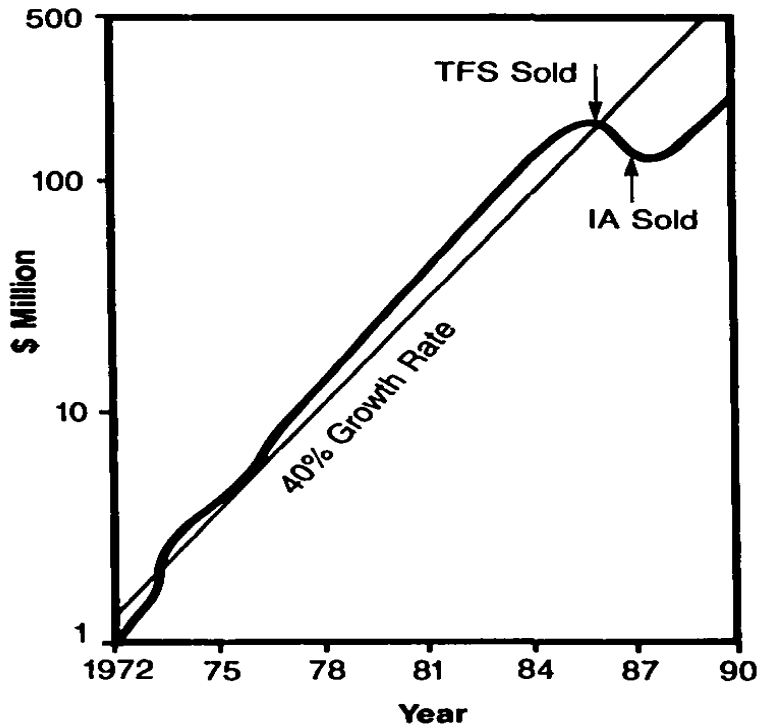
Conclusion

I have outlined a paradigm for corporate development that involves the following elements: rapid and continued corporate growth without bloating; continuous creation of new enterprises; guided entrepreneurship; and transfer of innovation from research laboratories into the marketplace. The vehicle is the open corporation, which has been extremely successful for Teknekron. By using the open-corporation model, Teknekron has increased the success rate of high-tech entrepreneurs, established a new vehicle for researchers to participate in the commercialization of their inventions, and enabled many of America's largest corporations to be involved in innovations transfer in a mode previously unavailable to them. In the process, all have profited.

The following statistics are illuminating. Over the first twenty years of Teknekron's history, the rate of start-ups averaged about one per year; since 1988, the rate has increased and is now 3-4 per year. As previously mentioned, four affiliated companies have been spun out into a new universe—ownership by the public or by a larger acquiring company. Annual growth of 40% has been consistently achieved (see Figures 1 and 2).¹¹ Annual revenues of the Teknekron group are now approximately \$225 million.

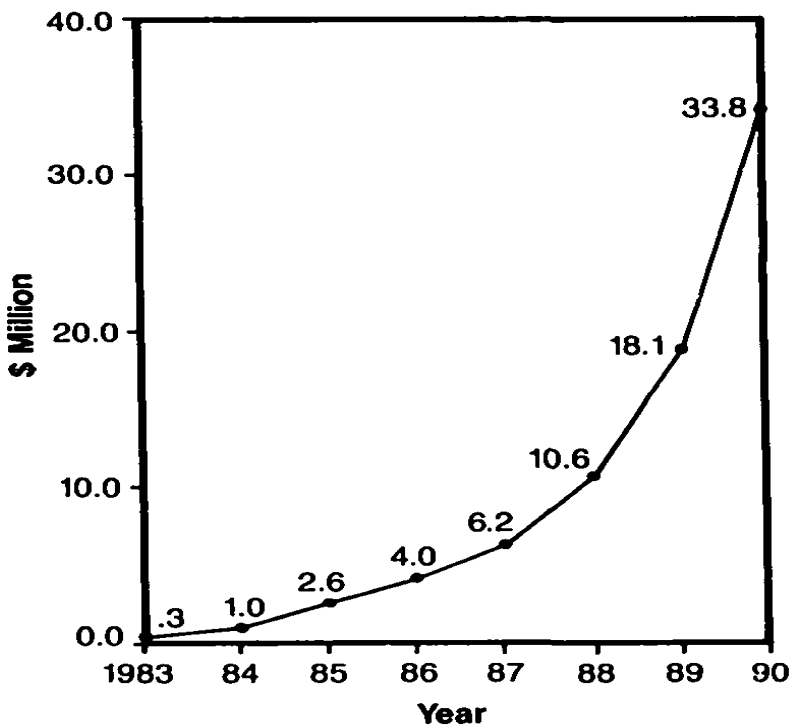
The question then arises, if the methodology has been so successful for

Figure 1. Teknekron's Revenues



Teknekron has grown an average of 40% per year since its founding in 1968. The graph gives total annual revenues of all continuing Teknekron operations. The logarithmic scale shows exponential growth as a straight line.

Figure 2. Revenues of Teknekron Communications Systems



The best Teknekron ventures grow considerably faster than the average 40% rate. Teknekron Communications Systems, Inc., which reached the spin-out stage in eight years, grew exponentially at more than 50% annually in revenues and profits from its start-up in 1983.

Teknekron, why are there not myriad other open corporations? What is it about our open corporation that has been a barrier to entry for others?

The answer may be the time it takes to go from a start-up to the liquidity event of spin-out, which is a measure of the interest others might have in sponsoring a similar open corporation. For Teknekron, that time has ranged from eight to fifteen years. This gestation period may arise from our being a company that works with corporate clients, rather than one attempting to capture a rapid-growth, end-user market. Or it may be because of our insistence that our entrepreneurs do product/system development after market validation, not before. Or it may be because we start with raw, young entrepreneurs who need to find their markets and must learn much on the way. Whatever the reason, many potential entrepreneurs find the prospect of a decade before obtaining liquidity simply too daunting. And when I mention ten years of illiquidity to investment bankers, their eyes glaze over.

Florida and Kenney have this to say: "While venture capital may be the best way of financing a high-technology sprint, the unfortunate reality is that the quest to secure the benefits of high-technology competition increasingly resembles a marathon."¹² I agree that America needs more marathon runners, and submit that the open-corporation model is a valuable way of training them and assuring their success.

References

1. T. Peters, "Get Innovative or Get Dead," *California Management Review*, 33/1 (Fall 1990): 9-26.
2. For a thorough study of this phenomenon, see R. Florida and M. Kenney, *The Breakthrough Illusion* (New York, NY: Basic Books, 1990). This book is important reading for those interested in further exploring the dysfunction of the innovations-transfer process in traditional and entrepreneurial U.S. companies.
3. Peters, op. cit., pp. 9-10.
4. Florida and Kenney, op. cit., p. 72 *et seq.*
5. For an early description of Hoyle's cosmology, see F. Hoyle, *The Nature of the Universe* (New York, NY: Harper & Brothers, 1950). A more recent and thought-provoking book on current cosmological theories is the popular S.W. Hawking, *A Brief History of Time* (New York, NY: Bantam Books, 1988).
6. G. Pinchot, III, *Intrapreneuring* (New York, NY: Harper & Row, 1985).
7. Peters, op. cit.
8. Peters, op. cit., p. 15.
9. This does not mean that we can circumvent the question of ownership of intellectual property, only that we are led to the property through the intellect, not vice versa.
10. Another fraction is reserved for staff members of the parent corporation who have helped form the start-up and assisted its growth to affiliate status. Majority control remains with Teknekron.
11. The 40% growth rate of Figure 1 refers to growth of units in which Teknekron maintains an interest, and therefore does not include private-sale spin-outs after their sales.
12. Florida and Kenney, op. cit., p.75.