

DESIGNING

THE INNOVATING ORGANIZATION*

JAY R. GALBRAITH

Innovation is one of those curious phenomena which is universally desirable. I have never met anyone who is against innovation. And more of it always appears to be better than less of it. Yet when it comes to creating it inside of existing organizations, innovation is one of the most difficult things to produce let alone to master. If everyone is in favor of it, why is innovation so difficult?

The question has been addressed continuously for at least 30 years. But about every ten years there is a peak in the level of enthusiasm. In the late 60s and early 70s there was a sudden interest in venture groups and new ventures departments. These internal venture capitalists gathered around a magazine called *Innovation*. By the mid 70s these ventures groups had all but disappeared and so had the magazine. In the early 80s another burst of enthusiasm occurred around the initial success of Exxon Enterprises and the concept of intrapreneurship. But by the end of the 80s, Exxon Enterprises had folded and along with it the enthusiasm for intrapreneurship.

Once again innovation became the watch word for the 90s. This time it was the knowledge explosion and competition through innovative new products and services with ever shorter life cycles. But just as the night follows the day, there are increasing observations that the disruptive technologies and new business models that create new value have been exploited by industry newcomers and not the incumbents. It is Dell, AOL and Schwab that are the success stories. The innovators of the past Hewlett-Packard, Motorola and 3M all had their stocks punished and managements criticized in 1998 for being slow to adapt and to innovate.

The question that naturally arises is whether internal venturing can be successful at all. Or are we trying to turn lead into gold? Some believe that venturing is indeed alchemy. They say that innovation is best left to the world of start-ups and venture capital. Existing firms should run today's business and acquire the new firms for tomorrow's. However reliance on the acquisition approach appears to be defeatist, passive and expensive. It is not a way to shape the future. And most of the

* This paper is a revision of the article with same title published in *Organization Dynamics*, Winter, 1992.

value will go to the acquired firms' investors. While acquisitions will play a role in any business building strategy, the company also needs an innovating capability of its own if it is to take a role in leading and shaping the future direction of its industry and to absorb the acquired innovative firms. This article will describe what that capability is and how to make it coexist with the current operations.

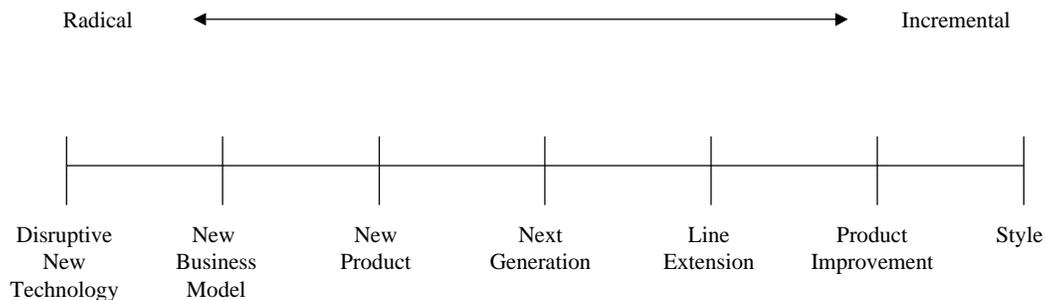
The position that I take is that a company needs two organizations to be successful. One is the operating organization. It is responsible for today's business. It is designed to perform activities for the thousandth or millionth time. It is designed to assemble the thousandth automobile or process the millionth deposit. The other organization is the innovating organization. It is designed to do some activity for the first time. It is designed to test a new product idea with a customer or a proof of principle for a new technology. The result is that these two organizations are not only different but conflicting and contradictory. The innovating organization is designed for trial and error. The operating organization is designed to prevent error. Therefore the third capability that a company needs is a leadership that can manage the co-existence of these two opposing ways of organizing. My hypothesis is that it is the lack of this third capability that prevents most existing managements from mastering innovation. Secondly there is a lack of understanding of what an innovating organization looks like in its entirety.

The first section of the paper will define the kind of innovation that is of interest in this article. Then an example of an innovation will be given. And finally, we will use this example to develop the concept of the innovating organization.

Types of Innovation

Innovation is the process of applying and developing a new idea to create a new product, process or business. It is not simply having an idea. It is the work to develop and implement that idea in the business world. But there are various degrees of "newness" and therefore different kinds of innovation. Different kinds of innovation will need different kinds of organization. These different types of innovation are shown as a continuum in Figure One.

FIGURE ONE: TYPES OF INNOVATION



On the right are the types of changes that are usually referred to as incremental innovations. The simplest new product or service is a style change. Whirlpool re-launched some new products a few years ago with new colors of Platinum and Toast. Usually these styles or repositionings are combined with product improvements like lower cost or added features and then called new products. A third type of new product is a line extension like a convertible model which BMW adds to its 300 Series. Each of these new products in turn is "newer" in the sense that there is a greater change from the current product and more effort and time is required to create them. There is also more coordination required between the functions in the business. Still more effort goes into the next generation product. For BMW a next generation would be a redesign of its 300 series. These are major efforts which take place every five to eight years in the auto industry. These new products are major revisions to existing product lines which incorporate the latest technology and market requirements. The above examples are the types of new products that most existing companies implement very well. They are innovations but they are incremental innovations.

The more difficult and more radical changes are the genuinely new products, new business models and new technologies which cause discontinuities in current practices and products. These are the innovations that usually come from new start-ups rather than existing players in the industry. The personal computer (PC) is a good example of a new product. When it was introduced it was not a new technology but a new computer architecture from a new computer company. And virtually every other new computer product came from a new computer company (the mini from DEC, the super from Cray, the desktop from Sun, etc.) not from the existing computer companies. There are examples of new products from existing players. Sony, with its innovating capabilities, introduced the WalkMan, DiscMan, Camcorder and others. The pharmaceutical industry is designed to produce "blockbusters". Chrysler, when it was in crisis, introduced the minivan. So new products from existing players are possible. There are just not probable in many industries.

The track record for incumbents is even worse for new business models and new technologies. The best example of an innovation in new business models is Dell Computer. It has virtually the same technology and products as its competitors yet it dominates its industry with a superior business model. That is, Dell's direct sales model avoids the computer dealer used by all of its competitors except Gateway, another start-up. But it is not just its direct sales but its assemble to order capability, direct customer relationships, relationships with suppliers, and a supply chain that operates with a lower level of working capital. Put all these features together, and you have a business model that is a source of competitive advantage. It is an advantage because the incumbents were unable or unwilling to respond and jeopardize their relations with their dealers. Charles Schwab has fashioned a similar model based on discount brokerage, discount mutual funds, back-room support for financial planners and investors, and on-line trading. At the end of 1998, Schwab had a market value greater than Merrill Lynch. The full service brokers are struggling to respond. So an important source of innovation today is new business models which configure assets differently to deliver value to the customer. These new

configurations are made possible by the Internet, overnight delivery, privatization, deregulation and new disruptive technologies like biotechnology.

The major discontinuities in technology are the most powerful innovations. They result in new products and new business models as well as new technology. These technology changes, like vacuum tubes to semiconductors or propeller driven aircraft to jet propulsion, always result in major disruptions to their industries. And again, it is usually an outsider and not the industry leader who is the innovator (Utterback 1984; Henderson and Clark, 1990; Tushman and O'Reilly, 1998).

It is these innovations, new technologies, new business models and new products, that are on the left hand side of figure one, that are of interest in this paper. The forces at work today require the reconfiguration of assets that in turn require these radical innovations. The transformation and convergence of industries caused by the digital revolution and biotechnology, liquid capital markets and privatization are only the most prominent of these forces. Today's successful company will have to fashion a combination of acquisitions, divestitures, spin-offs, partnerships and internal ventures. It is the creation and management of these internal radical innovations that we address in the rest of this paper.

Radical Innovation Example

Innovations do occur and they occur in all kinds of organizations. The problem is that there are not enough of them in existing companies. Many of these innovations, when they do occur, are regarded as accidents. They occur for unexplained reasons. In this section let us analyze an "accidental" innovation to understand what allowed it to happen. The idea being that this understanding will help us to recreate these facilitating factors and increase the probability that more accidents will happen. The story is a bit dated but the lessons are not.

The story begins with a young engineer and his group in a division of Hewlett-Packard. They had developed one of the first text editors (an electronic typewriter with memory and a cathode ray tube). Their problem was that they were in the wrong division. Their division's charter was to serve the technical end user and their product looked like it would be purchased by commercial end users, lawyers in particular. But the division with the commercial end user charter was not interested in the engineer's text editor. Frustrated, the young engineer scheduled an appointment with David Packard himself to explain his problem. Packard listened to the engineer, liked him and his product but said that he would not change decisions made by his division managers. Instead he suggested that the engineer and his group form their own company and get venture capital funding if they believed in their product. H-P gave them some funding and all their prototypes and took 25% of the venture.

The engineer and two colleagues did form their own company and were successful in attracting venture capital. They set up their company in the engineer's garage in New Jersey. They moved to New Jersey in order to sell their product to lawyers in New York and Washington. Their product was the first text editor and

was an instant success. The group expanded into new facilities and grew to become the industry leader in a couple of years.

As usually happens, success attracts others. Wang entered the business but with the added feature of a microprocessor. Wang introduced a programmable text editor which came to be known as a word processor. The young engineer and his team saw Wang's product immediately to be a threat. They responded by hiring some engineers who had experience with microprocessors and software. The engineering function was then challenged to create a second generation text editor which matched or exceeded the Wang product. The engineer, now president of the company, then went off to Wall Street and other financial centers to raise capital. The other challenge the young company had was financing rapid growth without losing all their ownership control.

Very soon, the young President became concerned. Wang was now growing faster than his company. He then reissued his challenge to the engineering department to produce a second generation product. Within the month they introduced their new product. It had a microprocessor in it but was short of the Wang machine in performance. The President congratulated them but then challenged them to improve the product and surpass Wang's. He then departed for Europe to start up operations in his native France. He created a subsidiary in France for Europe and one in Singapore for Asia. However he noticed that Wang was now larger than his company and was now recognized as the industry leader. He felt that he needed to do something about new products.

He began his new involvement in product development by reviewing the past and current efforts. What he discovered was major conflicts within engineering and between engineering and marketing. Within engineering there was disagreement between the hardware engineers and the software engineers about which method was better at providing various features. These debates were "resolved" by the head of engineering, a hardware type who left H-P with the President. But the marketing group believed the software engineers were correct and supported them. The result was acrimonious debates, outside studies and delay. So here we have a small, very young company that is unable to innovate and to adapt to the new microprocessor-based software world. You do not have to be a big, old, successful bureaucracy to have problems innovating. In this case the young company had a hardware establishment whose future was threatened by software.

While the President was puzzling over what to do, he received a phone call from his Hartford sales manager. The sales manager said that the President should come to the Hartford office because a local field service engineer had made some changes to the company's product. This engineer could make the company's product do what the Wang machine did. The President was on the first plane the next day. What he saw impressed him. The young field engineer wanted to use one of the company's products to track his own inventory of parts and customer orders. He sent a request to the company headquarters in New Jersey for some programming materials. But the response from headquarters was "It is against company policy to send programming materials to field engineers". Undaunted, the field engineer went

to Radio Shack and bought one of the early personal computers, a TRS-80. He taught himself how to program it and then used that knowledge to program the text editor, after making some hardware modifications. This change solved his problem and impressed the Hartford sales manager as well as the President when they saw it.

The President took the field engineer with him back to company headquarters. The field engineer explained to the engineering department what he had done. Unlike the president, the engineers were not impressed. They said the change was “cute” but not practical for volume manufacturing. And besides they had a product which would appear in few months that would be better. The president thanked the engineer and he returned to Hartford.

The very next day, the Hartford sales manager called again after hearing the engineer’s story. He said he thought the president should proceed with the field engineer’s start. He said the engineering department always promises a product in the future that is better than the one we have in the present. The president remembered how impressed he was with the engineer and recalled his own frustration at H-P. He brought the field engineer back to headquarters and reported the engineer directly to himself. Then he would figure out what to do next.

The president did not have to wait long. The vice president of Europe was visiting headquarters for a review of European operations. He heard the story of the field engineer and then talked with him. He became more interested because he had been receiving requests from a French bank for changes similar to what the engineer had created for himself. If he could solve the bank’s problem there would be an order for hundreds of units. The idea was reviewed with engineering who said it could not be done. The president sent the field engineer to France anyway.

Two months later the field engineer had solved the bank’s problem and the bank placed a multi hundred unit order. The president brought the engineer back and initiated a redesign of the product line. The effort was headed by a trusted marketing manager reporting to the president. The president told the marketing manager to take care of the young engineer and ordered the engineering group to support them. It took the engineer about six months to create a printed circuit board which would be inserted in all machines in the field and their performance would leapfrog all the Wang machines. The young engineer had done it again and kept the company in the race. The president celebrated for the moment and then began wondering what he was going to do next to find his next big innovation.

The Innovating Organization

The innovation in the story, like many others, is usually regarded as an accident. A combination of random events occurred to enable the engineer’s ideas to be tested and developed. In this section let us dissect the story and discover what were these factors that combined to enable the innovation. Our goal is to be able to recreate these factors and increase the number of innovations that get implemented. Most people object to the concept of an innovating organization. They suggest that we disorganize for innovation. Organization gets in the way of innovation they

believe. But my view is that the operating organization gets in the way. An innovating organization facilitates the process. But it is quite different from our operating organizations. Hence the need for 2 organizations.

The innovating organization consists of a combination of factors that reinforce each other, like in any organization design (Galbraith, 1995, Chapter Two). The factors that constitute an organization are the structure, processes, rewards and people.

Structure

The structure of the innovating organization consists of several roles that different people play, along with the separation of the operating and innovating organizations that will allow co-existence.

Innovating Roles

Innovation is not an individual phenomenon. It takes different people in different roles working together to be successful. Using the story we can identify three roles that are necessary for innovations to happen. The first is the role of idea champion. The field engineer is the paradigm example. While ideas can come from anyone, anywhere, they tend to come from people at low levels of the structure who have direct contact with problems and try to solve them. They are usually newcomers or in marginal positions who often see things differently. Their low status allows them to try new things since they have very little to lose. But this lower position and status indicates that the people most likely to develop a new idea are the people who are least likely to do anything about it. They need sponsors.

The sponsor, or second role, is someone who has the authority, resources and credibility to take ideas to further stages and to test them. They are like internal venture capitalists. They see lots of ideas and choose those with the best chance of business success. There were three sponsors in the story. The Hartford sales manager was the first to see the idea and recognize its significance. He then continued to push the president and further sponsor the idea. The second was the vice president of Europe who sponsored a trial with the French bank and the final sponsor was the marketing manager who led the last effort to redesign the product. He was the only sponsor who was not self-appointed.

Another lesson is that innovation is usually a stage-wise process of tests of increasing risk and investment. A sponsor is needed at each stage. At early stages the sponsors come from the operating organization but support an idea and a champion with future significance. In the final stages the sponsor and champion take on full-time responsibilities to completely develop the idea into a product or a business. For this process to work in an existing organization, more than just sponsors are needed.

The leadership of the organization is needed to allow innovations to happen. The leader role is the third role necessary for innovation. The president in the story is a good example. When he was raising capital and starting international operations, no innovation occurred. The hardware establishment prevailed. But when he became

active, the ideas developed until success was achieved in the market place. He did the right things. He allowed the tests to proceed and then supported the champion. When innovations are contrary to current thinking, champions and sponsors need friends in high places to exercise leadership.

Additional roles have been discussed in the innovation process. However it seems like champions, sponsors and leaders are a minimal set to generate and develop new ideas.

Separation

A salient factor in the story is that the idea was initially developed in a rather complete form at a remote site. If the field engineer was part of the engineering function, the department with the charter to create new products, the innovation would never have happened or would have been left to die. On the other hand if the performance improvement had resulted from hardware modifications, the engineering department would have adopted it and perhaps even been enthusiastic. So the more radical the innovation, the more separation is needed between the operating and innovating organizations.

The important point to be recognized is that innovation is a destructive process. Software innovations can destroy investments made by hardware engineers in education and experience. These innovations are seen as threats and trigger reactions from the establishment's immune system. When any immune system is provoked, it generates antibodies to kill the threat. So in existing companies, these threats are ridiculed by people with credibility, starved for resources by people with authority and not communicated to others outside of the threatened unit. These practices are bureaucratic antibodies. They may be neither conscious nor malicious responses. The hardware engineers had a genuine belief that the software features were inferior.

The above story, with only a change in characters, is taking place today. There are incumbents who form the company's establishment and whose immune system is being triggered by disruptive technologies and new business models. Inside these companies there are disruptions due to changes in technology from electromechanical to electronic, from hardware to software, from analogue to digital, from voice to data, from wired to wireless, etc. There are also debates about whether to shift to new business models based on the Internet. If these innovative efforts are not separated from the current organization and protected from antibodies by the leadership, they will not succeed. The innovation will come, instead, from an outsider who does not have to fight an establishment and master the new technology at the same time.

Several questions are raised by the idea of separation which we need to answer. How does one separate the new innovative effort from the current operating organization? What if the new technology has to be transferred back into the current organization? What factors determine how separate an innovative effort should be? Let us look at each of these questions.

Types of Separation

There are four ways which can be used either singly or in combination to separate a new innovative effort from today's current business.

1. Physical

The innovative effort, like in the story, can be physically separated from ongoing efforts by collecting the participants on their own floor, building or trailer in the parking lot. This practice originally came from the defense industry where top secret projects required a separate facility and only people with a security clearance could enter. The result was often highly innovative efforts as people were removed from previous constraints, worked with an entire team and did not disrupt the current operations. The auto industry is evolving this practice as it gathers a team, including vendors, for a new platform launch. This team works for the duration in its own building. BMW created what it called a prototype factory for redesigns of its models.

2. Structural

The activity to create a new product could be structurally separated from operations. The effort could report to a sympathetic sponsor somewhere in the structure. The engineer in the story was both separated physically and structurally from the engineering department. He was free to do what he thought to be appropriate. There was little that the engineers could do but disagree.

There are various degrees of structural separation. In the story the young engineer was in a region buried in customer service. But then he reported to the head of Europe and finally to the President via the marketing manager on the last project. In other companies the effort could report to the division, group or corporate levels. At each level there is a manager with more authority, resources and a longer time horizon. All of these features promote the innovation and give it more protection.

3. Funding

A third separation is to create separate funding streams for operating and innovating. It is quite possible to have a project take place within the existing structure at existing locations. The difference is that the funding comes from a corporate source. Often corporate sponsors may have longer time horizons and more receptiveness to radical innovations. The separate funding takes expenses off the books of existing business units which allows them to make their quarterly and yearly operating targets.

Alternatively, sponsors for radical innovations like new ventures groups are more likely to fund "crazy" ideas that a threatened or skeptical establishment would not. And then, with a more patient money outlook, radical sponsors may continue to fund and protect controversial projects.

These innovating funds are very often not authorized funds. The engineer in the story simply invested his own time and effort and did not need to ask for approval. Very often innovative efforts are not authorized. Engineers, in particular, do work on their own and "piggy-back" on top of or divert funds from incremental projects. To a certain extent, these efforts are healthy. They indicate initiative and

curiosity on the part of innovators. It is also wise to make initial mistakes without everyone being aware of them. In the story, the Hartford sales manager saw the completed effort. If he had seen an earlier trail which resulted in failure, he may have said "Why are you wasting time on this? You should be working with customers!" Instead the engineer was able to make mistakes, learn and improve. Then when the effort was successful, people from the operating organization could see it and its significance.

4. Control Systems

The control systems in a company are created for the operating organization. They are based on a logic of operations and the current business model. Innovation requires trial and error and often deviations from current practice. Therefore innovative efforts often require a separation from or suspension of control systems in order to conduct a trial.

The need for separation is greatest in zero defect businesses. The operations of nuclear power plants and commercial airlines are designed to prevent any errors since the costs of mistakes are so high. These businesses and ones like them are also designed to prevent any improvisation and experimentation with new ideas. Separation is required for trial and error and for innovation.

New business models change the rules of competition. In order to develop a new model, a new venture needs to be free of the old internal rules. For example, an existing business model may require low cost purchases of material or services. The new model may be based on speed and cost of material is a minor consideration. In this case, the venture should be freed from current purchasing policy in order to develop the new business model.

These freedoms are often controversial. For example, a new venture may be entering a growth phase of development. The current business may be in a downturn. Management may institute a hiring freeze. Should the freeze apply to the growing venture? The freeze may make sense for the current business but not for the future business. But by being free of the policy, the new venture will earn the animosity of the current business. The animosity may erupt into open conflict if the venture "poaches" some of the better people from the existing business. When a new venture is seen as the "rich kid on the block" it earns the animosity of the current organization and often prevents the transfer of results back to the existing organization.

In summary, the leadership influences separation by deciding upon the location of the innovative effort, where it reports in the structure, how it is funded and how exempt it is from the control system. These four factors can be combined in many ways to manage separation at different stages to achieve co-existence and transfer back to the operating organization. How does transfer happen?

Transfer to the Operating Organization

In general, the greater the separation of an innovating effort, the greater the difficulty of transferring the innovation back to the operating organization. Conversely, the greater the separation, the greater the likelihood of developing

something radical. These observations create less of a problem if the innovation will remain somewhat separate. When Sony created its electronic game, Playstation, it created a separate unit in each of the four ways that were identified above. The venture came under pressure from the electronics part of Sony to distribute the game through their electronics retailers. Playstation resisted because they felt the games should be distributed through the toy channel not the channel for audio equipment and TVs. The game should go to Toys-R-Us not to Circuit City. Playstation was correct and they remain a separate and most successful business unit in Sony.

A dilemma is created when separation is needed to get an innovation but the current organization will eventually make and distribute the product or service. The best and worst examples are advanced technology units. In order to get technology breakthroughs companies create elite groups and give them full autonomy. Usually these groups literally explode with new and different ideas. However virtually none of these ideas get back into the existing organization operating under existing constraints. The engineers in the existing organization have been told, implicitly, that they are the non-advanced technology group. Their incentive then is to show how the ideas from the advanced groups are impractical. The leadership challenge is to manage a process whereby innovations are created and then transferred to the existing organization.

The transfer of ideas from innovating to operating organizations takes place stage-wise. In the story, the first development of the idea was totally separate from the company, structurally, physically, funding-wise and policy-wise. The company was unaware that a company saving project was underway. But the second stage was a more realistic test. A sponsor from the existing organization volunteered to fund a test for a customer. The test in Europe, was still separate from the gravitational pull of headquarters. When it was successful, the third stage began. This time the development was at headquarters but was structurally separate from engineering control. So the model is to migrate a potential development from separate to ever closer locations. At each stage the tests are more realistic and people from the operating organization get a chance to modify the idea and make it their own. The migration is facilitated and protected by the leadership by using changes to the type of separation, structural, physical, funding and policy, and to the staffing of the effort.

Amount of Separation

The last question was “What are the factors that influence the amount of separation?” Several factors have been mentioned already. First, the more radical the innovation (the farther to the left in Figure One) the greater the separation at the beginning of the effort. Second, the greater the costs of mistakes in the operating organization, the greater the separation. A good comparison is between nuclear power plants and retailers. Nuclear facilities are run on zero defects processes and do not allow experimentation in them. Retailers however can create a new department in one of their many stores, stock it with new merchandise, run it with a new retailing concept and put a new brand on it. If the effort does not work, the department can be closed down and the merchandise returned. It is relatively easy to experiment in retailing. There need not be much separation at all. Nuclear businesses

and airlines can still experiment but it must be done off-line in the simulator or wind tunnel. These off-line units are safe places to fail. They are a practice field where trial and error learning can occur. Managers and innovators can make prudent mistakes and perfect their ideas. Then increasingly realistic trials can take place on test flights with test pilots before becoming routines in the operating organization.

The third factor is the level of antibodies that are likely from the established order. What is the likely level of toxicity? In the story the hardware establishment was not receptive and had several bitter confrontations with the software insurgents. The higher the level of antibodies, the greater the separation. Fourth, the greater the mismatch in time cycles, the greater the separation. It usually takes several years for a new business to become profitable and payback the investment. Operating organizations work on monthly schedules, quarterly results, yearly bonuses and two-year rotating assignments. These cycles are incompatible with the patient money approach of creating new businesses. On the other hand, new ventures move faster and require more rapid strategic decisions. Spending limits and approvals have little use and slow down decisions when competing with start-ups. Fifth, as suggested above, the faster the time to market, the greater the separation. When the new business is competing in Internet time, it needs autonomy, fast decisions and no constraints.

The sixth factor is whether the idea, once it is developed, must be transferred back into the existing organization or whether it will stay independent as a separate business unit. If it will stay separate, as Sony's Playstation, greater separation is fine. But if it is to be migrated back, the challenge arises. It is the seventh factor that becomes useful. The earlier the stage of development the more separation that is possible. Then as subsequent stages are begun the idea continues to migrate closer to the existing business.

The key concept is that separation is something to be managed. It is not that management sets up an incubator unit and funds it. The leadership must stay involved and actively manage the transitions at each stage. The leaders must become skilled at using the four separation tools and the staffing of the venture at each stage.

Thus the innovating organization has a structure. There are roles for champions, sponsors and leaders. These roles are enacted at various stages in the development of an innovation. This development is separated at these various stages by various degrees from the operating organization. This separation is changed at every stage in the development process.

Processes

In the story, the champion and the sponsors happened to find each other. We would like to increase the likelihood that more champions find more sponsors and increase the rate of innovation. Many companies create processes whereby these roles are likely to find one another. These processes fall under the labels of funding, and idea acquisition and blending.

Funding

The funding process is a formal process for creating sponsors. At its simplest, management makes some funds available for “breakthrough ideas” or seed money. These funds are given to thought leaders or previous innovators to encourage and help the initial development of ideas. The recipients thereby become potential sponsors. Champions propose ideas to these sponsors. The process is visible and match-ups between champions and sponsors are more likely. Greater visibility however makes an easier target for antibodies. Management should be prepared for conflict and protect the innovators.

More likely, the firm sets objectives and creates funds for new business or new products. These funds and objectives are separate from budgets and objectives for current operations. It is important however that each funding process work on the time cycle that fits its activity.

One of the most powerful features of an innovative organization is the ability of champions to access multiple sponsors. At one time this practice was quite common at 3M. If a champion had an idea and proposed it to their boss or division, the idea may or may not receive funding. If it received support, the champion would continue in place. Under the case where champions were denied funding, they could go freely to other divisions, to central R+D or to corporate ventures to seek funds from these sources. This feature keeps ideas alive and increases the likelihood of finding someone who will support a radical idea. In the story, if the field engineer could only get funding from the hardware establishment, there would have been no innovation. The fact that he had access to multiple sponsors, gave him multiple chances to find support and to develop his ideas. So if the only sponsor you have is your boss and the boss is part of the current establishment, the chances of radical innovations are greatly diminished. Innovation is not a hierarchical process.

Acquiring and Blending Ideas

Other processes can be used to surface ideas and match them with potential sponsors. A number of companies hold events for displaying ideas. Still others have processes for blending ideas. That is, the company wants a business idea not just a technology.

The internal trade fair event was perfected by 3M. Just as managers go to trade shows like the Hanover Fair, the Detroit Auto Show or Comdex for computers, they can also go to an internal fair where booths are created by champions to display their ideas. The show has several features which make it effective. One is that champions volunteer. The booths are created by people who select themselves and their partners, feel passionate about their idea and take the time to build a booth. So the booths are funded with “sweat equity”. Then the CEO and top management can attend and show their priorities for new ideas. In addition they tend to learn a great deal from the entire collection. And finally it gives champions access to multiple sponsors who they may not have known. The internal trade show is an effective means for gathering sponsors and champions in the same place.

Another way for champions to get access the sponsors outside of the establishment is for sponsors, like the head of new ventures, to actively seek out champions. For example, one head of business development said he found his best ideas and champions by going to the research labs on Saturday and Sunday. There he would find people investing their own time in their own ideas. The ideas were usually those that were not authorized or funded. By seeking out these people he gave them an alternate channel to get exposure for their ideas.

In addition to getting ideas, companies also want good business ideas. In the story the engineer was simultaneously the creator and the customer for his idea. He was solving his own problem which was like problems of many customers. Then he worked with a French bank. This example is like the current practice of working with lead customers. The practice is a way to blend technology and market needs. It is also a way of using customers to change the minds of the establishment. So a common practice is to send small cross functional teams to talk to lead customers and generate business ideas to meet their needs.

Other techniques are rotating assignments for potential champions. After several cross functional assignments they acquire general management thinking. A second effect of mobility is the elimination of walls across organizational units. Instead of walls or silos, networks are created instead. These networks are great idea blending mechanisms.

The last source of blending are the sponsors themselves. If a new business manager receives 20 proposals for new businesses, it is very likely that she will combine them and create a 21st idea. She could then attract a champion who could take and implement that idea. Sponsors are also important sources of ideas and should be selected for their idea generation skills.

So there are a number of ways that the leadership can increase the likelihood that people with ideas will find people with resources. When these processes are explicit, they communicate the leaders intentions as well as mobilize opposition. These processes once again, emphasize the destructive nature of innovation and its ability to create conflict.

Reward Systems

If a company needs an operating and an innovating organization, does it need a different reward system for the innovators as well. Like many issues connected with innovation inside of existing companies, innovating or special rewards are controversial. On the one hand, there is the view that an innovation requires extra effort and extra risk and therefore merits extra rewards. On the other hand, there are managers who believe that people are hired to be innovative. That is why they receive a good salary and bonus. People should be motivated to innovative as well as operate. Besides, people working on incremental innovations work just as hard and just as long as those working on radical innovations. However, I agree with the former position. Something has to motivate a person to make the 11th attempt when the first 10 trials failed. Something has to drive a person to continue when the

establishment, to various degrees, is trying to discourage the effort. Whether that extra something has to be money is another question which requires discussion. Let us first discuss reward systems for champions then for sponsors.

There is a consensus among the experts that the additional motivation needed for innovation can be provided by giving champions the autonomy and opportunity to pursue their own ideas. Champions, like the engineer in the story, are internally driven to prove their idea or solve their problem. They persist in the presence of obstacles like corporate policies. Champions, to various degrees are driven by a passionate desire to put their own fingerprints on things. In order to tap this motivation, most companies use volunteers to staff radical innovation efforts. This voluntary approach is the power of bottom-up innovation.

Some companies augment the autonomy given to volunteers with recognition practices. IBM has its "IBM Fellows" awards. 3M has its Carlton Society, which is its equivalent of a Nobel prize. The key to these practices is that many of them are peer-driven processes. For most professional people the most powerful motivators are the opportunities to work on cutting edge challenges and to be recognized by ones peers when successful. So a system where champions can find sponsors for their ideas augmented with peer recognition practices will provide the motivation to create radical innovations. If a company, like 3M, can be successful at achieving this level of innovation, there is no need to install special compensation systems.

The interest in using money to motivate innovation however continues. People see the rewards earned by entrepreneurs when their start-up goes public. These twenty-year-olds become instant multi-millionaires. Surely if these rewards were available inside the company there would be a greater incentive to innovate. It turns out that these people are correct. When money is tied to performance, it motivates that performance (Lawler, 1994). That is not the issue. It is not a question of whether money does or does not motivate innovation. It clearly does. But does money motivate champions enough to overcome all of the side effects of special treatment?

The president in the story wanted to give the field engineer a special cash award. However his team talked him out of the idea. They said the engineer clearly created the concept but other people in France and at headquarters made it feasible to mass manufacture the printed circuit board and fit it into existing products. A special reward would create one happy engineer and create a dozen unhappy team members.

Similar side effects occur in managing a new venture. If the venture team is given a special incentive, people in the operating organization often see it as unfair. They know that they come into the labs on Saturday and work late too. The venture team is seen as privileged. Then when the venture encounters a problem and wants help, the others are not enthusiastic to provide it. So it is the difficulty of administering extra rewards that creates problems. Most companies have difficulty in administering plain vanilla compensation systems. Complicated systems with special rewards and phantom stocks usually cause more problems than they solve.

As a result many firms have discontinued special compensation practices for champions.

Yet some companies persist in trying to find a way to match the financial incentives of start-ups. Why? The reason is that there is the need to attract and hold champions in addition to motivating them. 3M has chemical engineers in St. Paul, Minnesota and believes that it does not need special compensation. If it had software engineers instead and was in Silicon Valley, they would have a different problem. The lesson learned so far from experiments to make millionaires inside of companies is to simulate the start-up world. When people start their own companies, they usually take lower salaries and invest their own money. Every venture capitalist wants the founders to have some of their own money at risk. Too often, venture groups inside companies work for the same salaries and invest the company's money. If the venture succeeds they gain a lot of money. If it fails the company loses a lot of money. This asymmetry is what other people see as unfair. So companies are now trying to balance the risk-reward ratio to be fair and to be motivating.

In summary, extra motivation is needed by champions to persist at radical innovation in the presence of resistance and obstacles. This motivation can be attained through giving volunteers the autonomy and protection to pursue their ideas. Special compensation can be used to hold champions if care is taken in administering the risk-reward balance.

There is also the design of reward systems for sponsors. Division managers will sponsor ideas but will they sponsor new innovative ideas? They will if they have incentives to do so. The best known practice is 3M's goal for divisions to have 30% of sales coming from products less than four years old. Division managers must sponsor new ideas. This practice was introduced in the 1970s when President Nixon introduced price controls. So the best way to improve margins was to introduce new products. What 3M discovered was that literally overnight the relations between divisions and the R+D labs improved. Division managers were now enthusiastic about new product ideas. These percentage goals were great facilitators of the transfer of new ideas from the innovating to the operating organization. So innovating reward systems apply to the sponsors as well as to the champions.

People

Some people make better innovators than others. To the extent that a company can find, attract, select and develop these people, it will improve its chances to implement radical innovations. Again these people practices will apply to champions and to sponsors.

1. Champions

There is a popular stereotype of an innovator. They are usually portrayed as someone who does not fit well into existing companies. They are people who do their own thing and break the company rules, about like the engineer in the story. However these people are usually pursuing an innovation in an operating

organization. If the company also has an innovating organization these people will be more welcome and more likely to stay.

Initially there was a lot of research to see if there was a psychological profile which would distinguish between entrepreneurs and others. Most of that work has ceased. Today the best method of finding entrepreneurs is self-selection. Companies create opportunities and people volunteer for them. The internal trade fair described earlier is an example of such an opportunity. These are people who believe in their ideas and are willing to put in extra effort to achieve them.

The venture capitalists have developed some of their own additional screening techniques. They assess the person more than the venture idea. On the way to commercialization, the idea will change but the person will not. They look for several things. The preferred person has a broad background but some depth in an area close to the venture idea. Breakthrough innovations often come from the interaction of disciplines like bio-polymers or light emitting polymers. Someone with depth in polymers but a willingness to go beyond the discipline is preferred. In general champions have learned the knowledge in a discipline but have not accepted the religion. Then they create not just a technology but a business idea. In both these areas breadth of thinking and experience are valuable.

Today the belief is that the best predictor of future behavior is past behavior. For champions, the venture capitalists will examine their past to see if there is a history of initiative. Did the person start businesses before or as a teenager. How has the person reacted to adversity? Do they quit or do they persist to see the effort through to the end? These are indicators that the person is likely to be a champion. So these indicators plus a sequence of tests for volunteers like trade fairs, are currently the way the professionals select and attract champions.

2. Sponsors

Sponsors may be more difficult to find if a company has not had a history of innovation. Usually the best sponsors are previous champions. These are people who have developed an intuitive feel for the innovation process. They are more likely to recognize a future champion. Like the old expression "It takes one to know one". They are also likely to be a source of ideas. They are usually at crossroads of ideas flows and proposals. They can put together ideas for a breakthrough or a new business model.

Not all previous champions can be sponsors however. Some champions believe too strongly in their own ideas. They can easily become "intellectual tyrants" after being successful. These types are not good sponsors. Others turn into mentors who can manage champions. Sponsors also need political skills. Innovation was described earlier as a destructive process. Sponsors and leaders need to protect breakthrough ideas and yet gain credibility with the establishment. The best sponsor is probably a left-of-center insider. That is, they are enough left of center to respond to new ideas and have credibility with champions. But they are also insiders who the establishment trusts.

There are probably some other attributes but sponsors are in short supply. A firm often loses these previous champions. An innovating organization focused on new ideas is a good place for them. For firms with very little innovating experience can still probably find some people. Outside recruiting is not a good way to find them. The outsider will lack the political skill and credibility within the establishment. But there are usually some left-of-center insider types who would like the role and probably would execute it well. So there is hope for some breakthrough ideas in operating firms.

Summary

In today's environment, firms need to develop an innovating capability. To execute this capability the firm needs two organizations. It needs an innovating organization to do something for the first time and operating organization to do activities for the thousandth time. The third feature is that the firm needs a leadership to manage the coexistence of these two antagonistic capabilities. This paper has described what the innovating organization looked like in its entirety in terms of structure, processes, rewards and people.

Bibliography

1. Galbraith, Jay R. "Designing the Innovating Organization" *Organization Dynamics*, Winter, 1982.
2. Galbraith, Jay R. *Designing Organizations*, Jossey-Bass: San Francisco, 1995.
3. Henderson, Rebecca and Clark, Kim "Architectural Innovation: The Reconfiguration of Existing Product Technologies and the Failure of Established Firms", *Administrative Science Quarterly*, 35, 1990, pp. 9-30.
4. Lawler, Edward E., *Strategic Pay*, Jossey-Bass: San Francisco, 1990.
5. Utterback, James, *Mastering the Dynamics of Innovation*, Harvard Business School Press: Boston, 1994.