Creativity, Innovation and Quality
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I. THREE LINKED IDEAS: CREATIVITY, INNOVATION AND QUALITY
Creativity, innovation and quality - what do these three possibly have in common?

CREATIVITY
INNOVATION
QUALITY

For any business to be successful, we need all three. Creativity drives the generation of ideas, and we need these constantly. We must continually reinvent our businesses. We must unleash the imagination of everyone in our organization. We must create the playfulness and fun to unleash this imagination. Albert Einstein knew that great thinkers don't have to take themselves too seriously and that:

"Imagination is more important than knowledge."

-Albert Einstein

Innovation is the necessary step to turn these ideas into useful products and services, something we can provide to our customers, and something we can sell.

Quality, the entire set of tools now known as total quality management or TQM, is the way we ensure that we know our customers, their needs and expectations, and how we are going to meet these needs and exceed their expectations. Quality also helps us continuously improve our products and services and to continuously reduce our costs of providing them.

In this paper we'll try to pull together these three elements of successful entrepreneurship. All three elements - creativity, innovation and quality - have been studied extensively and independently. There are numerous books (or even libraries) about all three. At the end of the handout, we list some of the ones that we have found most useful.

What we hope to do here is give some new insights on the interactions of the three. We wish to provide some new ideas on managing all three together for breakthroughs in organizational performance.
Today we are going to focus more on the growth side of quality, not so much on the problem-solving side of just doing the same things we have been doing better. We are going to spend our time on how to create new things, new business opportunities, how to open up our organizations to new ideas.

Creativity and innovation are change! Do people like change? Does everybody really hate change? What if I offer you a new car, what kind of car do you have now? What do you really want? OK, how about changing now? What if I offered a free trade, no strings attached?

Maybe it is only some kinds of change that people don't like.

If we know how to manage change, if we know how to make creativity and innovation fun, we might be able to move quickly. We might be able to do some things we have never done before. We might be able to use quality management to grow the business, to expand, to explore new horizons, new directions.

**How Many Ideas Are There Out There?**

The difference in organizational performance can be striking. A typical company in the United States averages only 0.16 implemented ideas per employee per year. The Toyota Motor Company, on the other hand, averages 46 implemented ideas per employee. Are Japanese employees just more creative? Is this another cultural thing? How can it be? One American company is averaging 50 implemented ideas per employee per year, almost one per week. Another American company averaged over 62 implemented ideas per employee per year. What do these companies do that is so different from the average company? What is the value of these ideas?

**II. ROADBLOCKS**

Perhaps it is useful first to look at some of the roadblocks to creativity and innovation. In this paper we'll focus on creativity and innovation.

There is probably no better book to guide us in thinking about creativity than James L. Adams' Conceptual Blockbusting. In this delightfully easy to read guide by one of the world's leading design teachers, James Adams discusses several blocks to our creativity. He breaks these into four basic groups to aid our understanding:

1. Perceptual Blocks
2. Cultural and Environmental Blocks
3. Emotional Blocks
4. Intellectual and Expressive Blocks

**Perceptual Blocks**

Adams describes six types of perceptual blocks:
• Difficulty in Isolating the Problem
• Tendency to Delimit the Problem Too Closely
• Inability to See the Problem from Various Viewpoints
• Seeing What You Expect to See - Stereotyping
• Saturation
• Failure to Utilize all Sensory Inputs

We are all familiar with these perceptual blocks. We can spend hours, even days failing to see the obvious. Then when it hits us, we cannot believe how easy the solution really is. We are struck with the "blinding flash of the obvious."

The problem of seeing what you expect to see - stereotyping - plagues all of us. In working with quality improvement teams we see this all the time. It seems especially prevalent in high-tech companies. People in these companies are so used to finding technology solutions they sometimes overlook the simple, management or procedural solutions that quality improvement can lead to.

One team in a chemical company "knew" they had the right solution to a problem of a valve not tripping when it was supposed to. There wasn't enough air pressure coming through the one-inch pipe from the compressor. The solution was "obvious." Buy a bigger compressor. But the new compressor was quite expensive, almost $100,000, and required additional staff to maintain it.

When the team decided to look for alternative solutions, one jumped out. Put a four-inch pipe in place of the one-inch pipe. The problem was really not pressure, but airflow. The larger pipe enabled the current compressor to trip the valve easily. If the team had easy access to the money needed for the new compressor, that is the solution they would probably have implemented. Too often we use our first ideas, the typical solutions to all problems: more money, more staff, or more computers.

Saturation can take place in many ways with all of our sensory modes. An exercise used by many quality team instructors illustrates this. I first saw it used in New England Telephone.

The problem is simple: draw the telephone touchtone pad with all the numbers, letters and * and # in the correct positions. We all use this simple device every day of our lives, but few people get this exercise correct. In fact, even in New England Telephone, they went many months before the first person got it right.

On the other hand, when they let people work together as a team of four or five people, they always got it exactly right. Different people remembered different things, and knew that they knew and were able to convince the others. This makes an important point we'll
come back to later. The power of a team to be creative almost always exceeds the power of the individual.

The sixth perceptual block Adams discusses is the failure to utilize all sensory inputs. Too often in a business situation we tend to limit our sensory inputs to sight and sound. Taste, smell and touch are rarely used. During a benchmarking visit years ago, AT&T managers were shocked when one of the Japanese executives actually tasted the solder compound to see what kind of flux AT&T was using.

**Cultural and Environmental Blocks**

Adams discusses many different cultural and environmental blocks. Examples of the cultural blocks he gives, at least for those in our culture, are:

- Taboos
- Fantasy and reflection are a waste of time, lazy, even crazy
- Playfulness is for children only
- Problem-solving is a serious business and humor is out of place
- Reason, logic, numbers, utility, practicality are good; feeling, intuition, qualitative judgments, pleasure are bad
- Tradition is preferable to change
- Any problem can be solved by scientific thinking and lots of money

He also gives examples of environmental blocks:

- Lack of cooperation and trust among colleagues
- Autocratic boss who values only his own ideas; does not reward others
- Distractions -- phone, easy intrusions
- Lack of support to bring ideas into action

Some of these blocks are especially relevant to our subject today. These we will discuss through examples.

**Emotional Blocks**

Emotional blocks are also important. In the modern, high-tech business and in many other organizations we don't even acknowledge these at all.

The emotional blocks discussed by Adams include:
• Fear to make a mistake, to fail, to risk

• Inability to tolerate ambiguity; overriding desires for security, order; "no appetite for chaos"

• Preference for judging ideas, rather than generating them

• Inability to relax; incubate, and "sleep on it"

• Lack of challenge (problem fails to engage interest) versus excessive zeal (over-motivation to succeed quickly)

• Inability to distinguish reality from fantasy

We may not have emphasized enough the necessity of breaking the emotional blocks. One of the strongest is the barrier of feeling foolish. Often we don't share our ideas because we are afraid we are going to be laughed at. We are afraid others will think our ideas are stupid.

In James Adams wonderful book, Conceptual Blockbusting, he describes a simple game that he gets students at Stanford to play to get over this fear. He breaks the ice with the following game:

He divides the group as follows. If a person's last name starts with one of the following letters, he or she is that animal:

CAT A - G

MOUSE H - L

ELEPHANT M - R

PIG S - Z

Next, the person must find some other participant he or she has never met before and stand in front of that person. Then, when Adams says, "GO," they all must start making the sounds of that animal as loud as they can.

III. BREAKING THE BARRIERS TO CREATIVITY, INNOVATION AND QUALITY

Let's look now at some of the successful ways companies have managed to break down some of these barriers. These strategies have freed the intellectual creativity of all members of the organization and revolutionized the performance of these companies.

Many of the tools and techniques are familiar to any company seriously engaged in TQM. Just a quick review of a list of common tools will remind you of their importance.
Many of these familiar tools are widely used within companies to break down many of
the barriers we have just been discussing.

**Open The Doors**
One of the common misconceptions about creativity is that it just happens. Some people
are creative, some aren't. Nothing could be further from the truth. The companies with the
remarkable numbers of ideas from all over the company, from every level of employee,
every function, have worked very hard to achieve these levels of creativity.

**Open Up The Company To Ideas From Everyone**
The first step is to open the doors for new ideas from everyone. This is definitely not a
passive activity, not a suggestion box on the wall somewhere. This is not a suggestion
system committee reading written ideas in some dark room.

Toyota achieves its remarkable record of 46 implemented ideas per employee from an
extremely well-organized and managed system. The chair of this system is traditionally
the future president or chairman of Toyota. It is considered that important.

A key part of Toyota's system is quick feedback to everyone with an idea. Ideas are
collected in many ways: through normal supervisory channels, on "scratch sheets" on
walls, through quality control circles, and in almost every other way.

One company that studied the wonderful book about Toyota's success, Forty Years and
Twenty Million Ideas, is Shell Brasil S.A. As Decio Portella, the first Quality
Management Advisor in the company tells it:

"We began with a Suggestion Program, originally known as 'debureaucratization,' which
was later renamed as Individual Quality and Productivity Program, to stimulate the
'feeling of involvement' in the organization in terms of general improvements."

From the beginning Shell Brasil was off to a good start. This company of 3000
employees received over 2000 suggestions in the first year. Already in 1995 they have
over 11,000. This level is still a far cry from Toyota's 46, but it is 18 times better than the
average 0.16 ideas per person in U.S. companies.

Not long ago we got a call from Terry Ortynsky, President of Royal Ford Lincoln
Mercury in Yorkton, Saskatchewan, Canada. Royal Ford Lincoln Mercury is a dynamic,
45-employee company that had recently started implementing TQM. Terry found that
many employees were curious and wanted to get involved quickly. He wanted to create a
simple way to get many ideas and small projects going.

One of our consultants came up with a great idea that Terry and his management team
have implemented brilliantly -- 100 Improvements in 100 Days.

On a simple dry-erase board are "scheduled" two ideas to be created by each member of
the company. Everyone has a quota, and a date to fill his or her slot on the board. People
can spend up to $25 with no permission required, but they must implement their idea, not just think about it.

They jot down the idea implemented and state benefit, in dollars saved or impact on external or internal customers.

The response has been overwhelmingly positive. Many employees couldn't wait to get their ideas on the board and went out of turn! People started talking to each other about things that could be improved. Employees piggy-backed their ideas on ideas already on the board. Several employees pooled their $25 allotments to implement a GIANT suggestion.

Most ideas did not require any money to implement. Many directly impacted customer satisfaction. Others dealt with employee safety, facility cleanliness, courtesy and response times.

Recently Royal Ford Lincoln Mercury had a big celebration with a pizza lunch and one minute for each person to describe his or her idea to everybody else. Royal Ford Lincoln Mercury is expanding this 100 improvements in 100 days concept to all 365 days, making it a way of life in the dealership.

As seen in the preceding examples, our systems for getting everybody involved don't have to be elaborate. When Ford was almost ready to start production of the Ranger pick-up truck in Louisville, they posted the drawings on the walls. Employees were asked to comment, writing right on top of the drawings, on the design and manufacturability. They received over 300 ideas they implemented in three months.

These design changes helped this truck be such a success. One idea shows how simple this can be. One worker asked, "Why do we always put the bolts in the truck bed from the bottom? I have to stand in a grease pit and hold a heavy bolt gun over my head. Sometimes I get tired and let a couple of trucks go by while I rest. Why can't we put the bolts in from the top?"

Of course, the answer was, "We've always put them in from the bottom." No one could even remember the reason. Now they put them in from the top, no more grease pit, no more missed bolts.

Sometimes the employees themselves may have to open up the doors. David Armstrong of Armstrong International tells about one of the times even the head of R&D had a hard time getting the attention of the president. He had figured out a way to use a revolutionary kind of steam trap on paper dryers. But the president was too busy to talk with him. He needed a creative way to grab his attention. He wrote his report on a roll of toilet paper and sent it to the president."

The lesson here is, use whatever works.
**Brainstorming**

One of the most widely used techniques to open up an organization to new ideas is brainstorming. This simple technique frees up people to contribute without criticism. It helps break down quickly the fear of sounding stupid, of having one's idea picked to pieces. It also allows us to quickly build on other ideas.

One of my favorite examples of an easy way to introduce this idea into company discussions again comes from David Armstrong.

His problem was simple: How was he going to get people to accept new ideas? His solution was to hand out M&Ms. He handed everyone entering a meeting an M&M. Then he told them:

"You are allowed one negative comment during the meeting. Once you make that comment, you must eat your M&M. If you don't have a M&M in front of you, you can't say anything negative."

"It was great! Instead of being threatened by new ideas, people supported them. Anything negative was instantly met with a joking "Shut up and eat your M&M."

We even got a new product idea out of it—steam traps that change color when they stop working. We're now testing ten of them in the plant belonging to one of our major customers."

As David puts it, “I'm buying more M&Ms."

**Ideas from Vendors**

Many companies have been stunned by how many ideas they are getting from their suppliers. Somehow, they had never considered their suppliers as a source of ideas for new products or improved designs.

Often these suppliers are the true experts in their part of the product. Recently the CEO of one small company that makes high-quality labels for the auto industry and other leading companies like Xerox was telling me how fast business is changing these days.

All his major customers are entering into long-term relationships with him and giving him far more control over the design of the product he supplies. Xerox has gone the furthest. They merely describe in general terms the types of labels they need. His company designs the labels. Using their superior knowledge of their business, they develop state-of-the art labeling using the most efficient manufacturing processes and best materials.

They are able to provide Xerox with their highest quality - and best prices, far better than they are able to do for companies who still rely on pages of written specifications and requirements.
Ideas from Customers

We often forget one of the best places to get ideas - from our customers. A few years ago Cadillac was stunned when they created a number of 800 lines to receive complaints from customers. The calls did come in, more than 2400 a month. But over 80% of the calls were not complaints, they were suggestions for improvements for the next model.

When starting a quality improvement program, many executives have found that the absolute best place to start is by improving those things that your customers would like you to improve. Collecting these ideas and acting on them has been an unexpected gold mine for many companies.

Ford has probably done as much as any company in the past few years to challenge the traditional way of doing things. The development of the new Mustang is a wonderful example of this "Just Do It" attitude.

When Ford first considered redesigning the Mustang in 1989 the projected $1B development cost just seemed too expensive. "Team Mustang," a group of 400 people, scrambled to save their beloved car and solve a key riddle for the 1990s: How do you make a product that stirs the soul on a limited budget?" [Wall Street Journal, September 21, 1993]

The plan for this "skunk works" involved putting all 400 members of the design team under one roof. They had draftsmen sitting next to "bean counters," engineers one room away from stylists. They broke the traditional budgetary walls that separated departments and the traditional lack of communication that has plagued design teams for decades. One of the most creative changes Ford made was how they involved suppliers.

"We did away with the usual arduous bidding process most Ford projects endure when selecting suppliers. Instead we picked suppliers early based on past performance on quality and efficiency. These suppliers were invited to become part of the design team." [Quality Learning Series, October, 1993]

While developing the new Ford Mustang, Ford designers incorporated ideas from active members of Mustang clubs. Hundreds of Mustang enthusiasts kept abreast of the design activities through electronic-mail dialogues with Ford engineers.

One of the best examples of how focused Ford has become involves how they solved the stability problem of the new convertible model of the Mustang.

While working on one difficult problem of stability, Will Boddie, the engineer who led the development team, saw a new Mercedes convertible in front of a restaurant. He instructed his engineers to buy one and take it apart to see how Mercedes had solved the problem. The result was a 25-pound steel cylinder bolted to a spot behind the front fender. This damper muffles vibrations like a finger on a tuning fork.

The results of all this activity were spectacular. The Mustang was redone in three years for $700M. That is 25% less time and 30% less money than for any comparable car
program in Ford's recent history. These savings are enabling Ford to aggressively price this car in the market. The methods developed are being shared with all other designers of Ford cars.

**Force Creativity**

Many people still believe that some people are born creative and others aren't. When we examine the success of companies around the world, small and large, we find that this is far from the truth.

The creative companies work hard at creativity. They have extremely active suggestion systems, they provide time to examine work processes, they actively support the implementation of ideas, and they train for creativity.

**Create a Vision**

Many times what we need is a clear vision of what we can achieve. With this vision firmly in mind, the ideas flow. One example of this type of driving vision is Steve Job's vision for the Apple microcomputer. While reading a Scientific American article one day on the relative efficiency of animals, Steve was struck by how ordinary human beings are. We are no better than somewhere in the middle of the pack in converting energy to speed. But put a human on a bicycle, and the human far exceeds the efficiency of any animal.

Steve's vision of the Apple became a "bicycle for the mind."

Recently the New York Times had a wonderful story on turning this conventional wisdom upside down. For years sheep farmers have had an increasingly tough time with coyotes. Even as far east as Virginia this has become a major problem. The traditional methods - traps, poisons, shooting - just don't work too well and cause all sorts of other environmental problems.

The solution - create a sheep that hates coyotes and chases them away. Sounds impossible, doesn't it? Sheep just don't act that way. But llamas do. Here is another wool bearing animal that bonds quickly with the flock and seems to delight in chasing coyotes. The addition of a few llamas to each flock has reduced deaths from coyotes by over 80%.

Most of us are far more creative in a group than we are individually. The group process stimulates us. The discussions cause us to look at things in new ways. The support for our ideas encourages us to implement these ideas.

Executives have frequently expressed amazement about how creative their quality improvement teams are. These teams have become hotbeds of creativity.

**Teams, Teams, Teams**

Several years ago Edwards High Vacuum International in England saw both a problem and an opportunity. The highly corrosive atmosphere in semi-conductor plants was creating extremely high maintenance costs for customers of their high vacuum pumps. These maintenance costs could be as high as $45,000 per system each year.
They first responded by modifying one of their standard pumps using expensive synthetic oils, changing materials in the pump and fitting inert gas purge systems to protect the bearings and seals. An analysis soon revealed that many of their problems were associated with the lubricating oil and what they really needed was a dry pump.

Their senior Pump Engineer quickly evaluated several alternatives and came up with a workable design and made a batch of prototypes. But instead of rushing into production they put a team together to go into the market to learn and keep in close contact with their customers in the semi-conductor industry.

They quickly found that the tough environment meant that it was important to be able to take the pump apart, clean it and put it together again quickly and easily. Having 50% fewer parts and fully dowelled construction would certainly help.

The team also tackled the job of how to make this pump. The goal was to take a casting and complete the job on one machine with precision lathe work and short lead times.

When they introduced the pump into the field the team made sure they knew where each pump was used, what the process was, if a pump failed exactly why it failed, and what back up service the user needed. As problems arose the team solved them and informed all the users of the steps taken. They quickly developed a very special relationship with their customers. They learned that selling a customer a pump is only a small part of the business scene. It was very important to establish service depots close to the end users, to be able to offer a comprehensive range of service contracts, and to be able to guarantee maximum up time for the equipment.

In just five years their sales went from $400,000 to $3,700,000 to $8,300,000 to 20,300,000 to $36,000,000. Their market share has increased from 16% to 60% and now they are even the market share leader in Japan where most of their competitors are located.

**Create a Theme**

Ideas don’t just happen. If you believe this, put up a suggestion box on the wall and wait, and wait, and wait. Companies with numerous creative, innovative ideas force these ideas. They create themes, focus topics, goals. They have group sessions, discussions, brainstorming. They refuse to give up. One of our favorite examples comes from BoardRoom Reports, an incredibly innovative publisher. Each day they create a theme, a topic, to focus their creative juices. Everyone is asked to think about how they could improve a certain area: mailing lists, columns, new topics, etc.

One former employee told us how far they sometimes go. She went to the ladies room and found on the back of the door the theme for the day. Next to the theme were several pads of PostIts. A friendly sign suggested she not leave until she had at least two new ideas.
Try, Try Again
The most successful - and most creative - companies never stop trying. Each failure is seen as something else learned. Edison's famous comment when asked about all his "failures" at creating an electric light should be our guide. He refused to call his experiments failures; after all, he claimed, each time he had learned what did not work.

Organize for Success
To force creativity we must create a structure that supports ideas, helps with the implementation, and stimulates ideas from every source.

Possibly the world leader in suggestions, ideas and innovations from its entire workforce is Toyota. At Toyota, these ideas don't just happen. They have created a top-level organization to promote the "creative spirit" in the company.

No one has come even close to the structure Toyota has created for achieving remarkable results from ideas from everyone in the company. In 40 Years, 20 Million Ideas, Yuzo Yasuda describes the process they have used so successfully.

Toyota's Creative Idea Suggestion System has inspired numerous Japanese companies, and more recently American companies, to create similar systems. This has led to findings by the Japanese Human Resource Association that Japan's strength in management: "...is not to be found in large numbers of people increasing efficiency by working according to standards and manuals created by a few talented persons. Rather, it is in the massed strength of many individuals concentrating on their own duties, having problem consciousness, eliminating even slightly inconvenient aspects of the work before them, and making improvements to increase efficiency."

Through suggestion activities, everyone has the chance once or twice a month to re-evaluate his or her own work. In addition, employees consider improvements for problems in small groups.

Various means are adopted to develop employees' abilities. Concrete activities, such as individual guidance through evaluation of suggestions, mutual development within a group, or individual information gathering, bring a large measure of personal growth to the workplace. "...

Part of organizing for success is finding a way to eliminate barriers, especially the bureaucratic nonsense that creeps into even the smallest organization.

David Armstrong is passionate about this at Armstrong International:

"Knock down the walls. If you want people making decisions, and making them quickly, you need to eliminate all visual barriers. That means no closed office doors, no walls between departments, no restrictive lines on the shop floor, and, of course, no organizational charts or job descriptions. Only after you eliminate all of them can you work on the nonvisual impediments to motivation, trust, and quick decision-making."
How will people know what to do...if there aren't any job descriptions? That's simple. If you've made your company's goals and objectives clear, people will know what their job is."

**Kill NIH**

Another impediment to fast innovation is the belief that we must create all ideas ourselves.

My former company, AT&T Bell Laboratories, was a master of the dreaded Not Invented Here syndrome. We were so bad, we were certain we had invented NIH.

I remember my first multi-level seminar as a young supervisor. We were in a time management workshop. The instructor was incredibly enthusiastic about his field and extremely knowledgeable. He continually referred to different books in the field. He invariably received blank stares to his questions, "Have you read this?"

Finally, our senior executive sat up straight in his chair and said, "Young man, at Bell Labs, if we need a book, we write it!" Unfortunately, he was only half joking.

As AT&T became more competitively challenged in the early 1980s and began working hard to change the culture in order to quickly develop and introduce new products into the market place, this NIH syndrome became a burden.

One lab created a wonderful way to break down this barrier to creativity and innovation. They created a new award, the "thief of the month." Each month they would honor the individual or team who stole the best idea from somewhere else. These "thieves" would be pictured in the Bell Labs News with a story describing how using these ideas accelerated the development process and reduced unnecessary redundant work.

We have a major emotional roadblock to stealing ideas. We have been taught for years that this is wrong. We must have original ideas. Many colleges have even made us sign pledges on every homework and every exam that this work is entirely our own. David Armstrong gets almost passionate about this:

"As children we're taught stealing is wrong. But in business that's not always true. You should "borrow" unpatented ideas from the best people and companies you can find. It's an efficient way of satisfying your customers, and we do it all the time.

Then Hummingbird, one of our major competitors, came out with a fish finder that showed little red squares on the screen when the object below was probably a fish.

Instead of squares, we showed fish shapes. We also showed the size of the fish.

When it comes to new ideas, we are shameless thieves.

"The "if it's not invented here we won't use it" syndrome can be fatal. There's nothing wrong with swiping an unpatented idea if the idea will help you do a better job serving your customers."
Break All The Rules

Too often what is holding us back is our understanding of the rules. Just as some of us wouldn't draw our lines outside of the imaginary box in the nine-dot game and others wouldn't think of bending or cutting the paper, most of us fail to see how "breaking the rules" can lead to incredible breakthroughs in our organization's performance.

Ruth Owades is a fantastic example of a businesswoman who "breaks the rules." Her first business was the successful Gardener's Eden mail order catalog store. After selling the business, she became restless again. Instead of just rushing into something similar because she knew the business so well, she began looking around for a business to "re-engineer."

What business was so bogged down in tradition it had not taken the time to reinvent itself recently? She soon discovered flower retailing. If someone wanted to send flowers to mom on Mother's Day, the usual procedure was to call one's local florist who placed a call to another participating florist who selected and delivered the flowers to mom.

This sounds straightforward and efficient. But when you look behind the scenes as Ruth did, you began to see what is actually going on. The florist that delivers the flowers to mom has got these flowers from a distributor who got their flowers from a wholesaler who bought the flowers from a farmer. By the time the flowers get to mom, they are nine days old.

Ruth created Calyx & Corolla to cut out three middlemen, and with the help of Federal Express, connects the farmers directly to the customers.

Customers call Calyx & Corolla headquarters using an 800 # and order from pictures in a catalog. Calyx transmits the order to growers by computer link, the farmers cut and package the flowers, and FedEx delivers the flowers up to nine days fresher.

Train for Creativity

At Shell Brasil's Aviation business unit, Decio Portella doesn't wait for ideas to happen. He trains for them. His first action in taking over the business unit was to organize a quality workshop for his management team. After making sure everyone understood the concepts, he used brainstorming techniques to list some "quality problems." In no time his managers created a list of 100 problems that needed to be solved.

He has personally led a series of quality workshops for all heads of airport operations and supervisors. With members of his management team he has conducted workshops at all airports where employees receive basic quality training and list improvement possibilities in their units.

Decio now has around 250 people out of 290 employees involved in some quality project. In two short years they have got almost the entire business unit involved with about 80 projects underway.
Not long ago they had 26 types of mobile supply equipment for complex operations in a country with varied features and all kinds of airports from the giant international airports of Rio de Janeiro and Sao Paulo to small landing lanes in the Amazon towns. It took an average of 60 days to get one of these vehicles ready for operation after delivery to the airport.

Today they have standardized on five types of vehicles and have them operating within 48 hours of delivery to the airports.

Other teams worked on tire wear on their vehicles. These heavy refueling vehicles wear out tires at an alarming rate. By redrawing routes and training all operators they have saved 49% of tire expenses.

**The Knack**

Sometimes we don't know why someone is so creative, they just seem to have "the knack." I was the organizer and host of a series of senior executive seminars on quality management at AT&T while I was at Bell Laboratories. This is when I got to know Dr. Juran so well. He was our featured speaker for the part of the workshop on quality improvement.

Many of the seminars were heavily attended by software development organizations, a critical and growing part of AT&T Bell Laboratories' activities. Dr. Juran became intrigued by the story of one software engineer named Michele. She had an unusual track record. The amount of redoing required relative to her work was far less than for any other developer, so far less that she was in a class by herself.

Dr. Juran quickly became interested. In the past he had run into many similar situations. Many times there are enormous differences in the levels of performance among individuals - some just seem to have the "knack."

So Dr. Juran started quizzing the executive. What was Michele doing that was so different than what others did? Did she have some particular knack that could be discovered? Could it be taught? Does she perhaps even know what she is doing that gives her such superior performance? Does she even know her performance is that superior?

Thomas Edison tried very hard to hire people with the type of knack he wanted, a knack for practical experimentation. When interviewing new engineers, he'd give the applicant a light bulb and ask, "How much water will it hold?"

There were two ways to find the answer. The first choice was to use gauges to measure all the angles of the bulb.

You can quickly see that is not easy. Finally after making the measurements, the engineer would calculate the surface area. Even for a talented engineer, this approach could take as long as twenty minutes.
The second choice was to fill the bulb with water and then pour the contents into a measuring cup. This took about a minute. The engineers that took the practical approach heard Edison say, "You're hired." Why guess when you can try.

MAKE SOMETHING HAPPEN
Too often in creativity or innovation as in other things we become paralyzed with analysis or study. Sometimes we just need to do it.

Just Do It
Too often we study everything to death. We fail to act because we have become too fascinated with the desire to get everything right the first time.

"Perfectionism is spelled p-a-r-a-l-y-s-I-s."

-Winston Churchill

One of the most famous physicists in recent years in the U.S. was Richard P. Feynman. Professor Feynman had a knack for "just doing it." He would take any problem, whether it was learning to play the samba drum well enough to participate in Rio's Carnival, or selecting books for California's high schools, or solving the problem of why the Challenger space shuttle failed.

Most of us remember the dramatic way Feynman showed the world the true cause of the failure. In front of the Congressional investing committee, he dropped a small O-ring in a glass of ice water. When he took it out, the brittle O-ring broke easily. It had lost all of its resiliency.

Study, Study, Study
Sometimes a bright idea is not enough. As Edison was fond of saying, "Invention is 99% perspiration, 1% inspiration."

Support and Act
Just having an idea is definitely not enough. We have actually got to do something with that idea, to go from idea to innovation. Then we have to transform this innovation into a working product that we can actually sell. Edison's creation of the light bulb is a wonderful case study. He had the idea, and he had the skill to turn the idea into a workable product. And he also knew how to develop the means to produce and distribute this product. As reported in Drucker [1985]:

"The power of a clear focus is demonstrated by Edison's success. Edison was not the only one who identified the inventions that had to be made to produce a light bulb. An English physicist, Joseph Swan, did so too. Swan developed his light bulb at exactly the same time as Edison. Technically, Swan's bulb was superior, to the point where Edison bought up the Swan patents and used them in his own light bulb factories. ...Before he even began the technical work on the glass envelope, the vacuum, the closure, and the glowing fiber, he had already decided on a "system: his light bulb was designed to fit an electric
power company for which he had lined up the financing, the rights to string wires to get the power to his light bulb customers, and the distribution system...Edison produced an industry."

IV. WHAT'S POSSIBLE

In many companies we are just beginning to explore the possibilities of creativity, innovation and quality when everyone is involved, bureaucracy minimized, and actions taken quickly.

One driving force stands out among the successful companies. This is incredible fun! Turned loose, all of us start thinking of a wide variety of ways to change our own work processes, our departments, our companies.

**Have fun!**

Playfulness drives creativity. It is not an accident that the homes of the greatest practical jokers in the country are the great engineering universities such as MIT, Cal Tech and others.

When I joined Bell Labs, many of the first stories I heard about working there were the practical jokes. I soon became accustomed to ducking when certain members of technical staff or secretaries came in to my office. They were sure to be carrying water pistols.

I remember one day when four secretaries decided they had had enough and ganged up to soak one of our supervisors. They rushed in his office, guns blazing. At exactly the right moment, he popped his shield (an automatic umbrella).

One of our people returned from a two-week vacation and couldn't find his office. Since we were reorganizing frequently at that time, he was sure his office had just been moved, but he couldn't find out where. After several ideas, he finally figured it out. His friends had found a wall panel in the basement with no door opening and had substituted it for his normal wall.

Southwest Airlines is famous for their spirit and playfulness. Passengers tell of being startled by a flight attendant leaping out of an overhead bin with a warm, friendly greeting. Is this why they are so profitable while the other airlines are struggling?

Anyone working in Silicon Valley has a wealth of stories to tell. My favorites usually involve the computer companies, intensely competitive companies that still have a great deal of fun.

One year on April 1st, Bill Joyce, Senior Vice President of Sun Microsystems, left his office to find his red Ferrari "floating" on one of the ponds in their campus environment. Some of his rambunctious friends had carefully constructed a wooden platform under a few inches under the surface of the pond, driven the car over a temporary bridge to the platform, and removed the bridge.
The next time someone looked, there sat Bill in the car, listening to the radio and reading the paper.

A few years later, when Scott McNeely of Sun and John Sculley of Apple went to their respective staff meetings on April 1st, they were stunned by the faces around the table. The company executives had traded places. But they were wearing photographs of the correct staff members over their own faces.

Quality team days are sometimes a shock to more conservative members of management. Presbyterian Health Systems of Charlotte, North Carolina had their first team day on October 31. The teams used this opportunity to dress the part. Team members came as almost anything, from wild west outlaws to a colon with cancer.

**Question Everything**

We sometimes forget to stop and ask, "Why do we do things this way?"

Things change. Periodically — at least every three years — you must reexamine every rule and procedure to see if it still makes sense.

**V. ACT NOW**

Creativity, innovation and quality are not something we can decree. We must work at them, but we don't have to do everything at once. As David Armstrong reminds us:

"Start Small…

Small starts are the best starts.

Small starts are cheaper.

Small starts are easier to accomplish.

Small starts are easier to kill.

Everyone counts.

Spread the word."

Starting small is one of the real secrets. This is illustrated over and over in Forty Years, Twenty Million Ideas. Too often in the U.S. we are looking for the breakthrough, the real winner. We forget that the little ones add up fast. As David Armstrong makes clear:

"Correcting a thousand little things is far better than correcting one big thing. One thousand times $18,867 equals $18,867,000. What big thing could we do to save that much money?"

The Japanese Human Resource Association study of ideas and suggestions in Japanese and American companies illustrates this difference in thinking. While Japanese companies average 24 suggestions per employee per year and implement 82% of these,
American companies average 0.16 ideas per employee and implement only 22% of these. The American suggestions are for far bigger improvements, $5500 savings versus $100 savings in Japan. But when we do the math we quickly see the average 100 Japanese employees save their company $200,000 per year, while the average 100 American employees save their company less than $20,000.

The other part we forget is that the little ideas are the training ground for the breakthroughs. Toyota managers continually encourage their people to come up with the little ideas, ideas that make their work a little easier, ideas that reduce the time to do a particular task by a few minutes, a few seconds, ideas that make the outcome a little better.

As Toyota discovered years ago, there are three necessary ingredients for making the company come alive with creative ideas.

First we need a leadership that supports ideas and suggestions from everyone in the company.

Second, we need a structure for making this work. This often takes the form of a secretariat staff for helping keep track of the ideas, supporting the implementations, and providing the sharing of ideas across the company. This may be as small as a person operation in a company like Shell Brasil, or a part-time function in an even smaller company.

Third, we must have supervisors who are pivotal in promoting suggestions. These front-line supervisors are critical in making these innovations flow.

Let's all remember Thomas Edison's motto: "There is a better way. Find it!"

REFERENCES


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