

Xerox Corporation

Planning for Continuous Innovation:
Turning Ideas into Gold
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Let me tell you a story. In 1978, I was driving along the beautiful San Wakeen Valley in California one morning and I was intrigued by what I can only describe as a contraption, which was standing in a field of tomatoes. It was unlike anything I'd ever seen – an alien thing with arms and legs and motors.

Curious, I stopped and asked one of the men standing by it what in the world the thing was. He explained that it was an experimental tomato picker designed to pick delicate tomatoes without damaging them. But it wasn't working well they said. And they looked discouraged. There were squished tomatoes on the ground.

Not long after, I heard that the problem had been solved, no, not by a better machine but by the tomato. Someone had figured out how to come up with a different tomato, less prone to bruising when picked and hardier during shipping. Someone had looked at the problem from a different angle, hardly surprising since we know inventors are contrarians by nature.

Of course, sometimes they are impractical as well, as you can tell every time you eat a modern tomato.

The point is not lost, however: invention is the mother of necessity for modern business.

And yet, believing that is true, I recognize that for every i-pod, there are a dozen a, b, c, and k pods that never see the light of day. That's why the first cousin of invention, that is innovation, must always be included in plans and intentions of any business.

If invention is the one great breakthrough that changes everything, innovation is the lesser, but still significant advance that changes the right thing. It's perhaps not as sexy or bold or outrageous as invention, but

innovation, who often stays home on a Friday night, can be the better earner of wealth and steady earnings. I believe that invention and innovation must both be allowed their voice and their space. In order for a company to make a success of this pair, they must exist in a coexistence that is consciously guided by good management.

This is a point on which I and Xerox speak from experience. Whether it was the invention of digital laser printing or the Ethernet, even some would say, the personal computer itself, Xerox has witnessed some spectacular leaps forward in technology. But as you also know, at some critical points we failed to manage those strides. Sometimes it was a failure of discipline, sometimes an inadequacy of translation from the lab to the marketplace. However you analyze it, we had a near death experience – we saw the long white tunnel, but felt no peace.

It was a scary time, but I'm here today because of one simple fact: we learned from our mistakes. We learned how to integrate both invention and innovation into our products, our culture our working lives and our bottom line.

In short, we have understood better than most how to turn invention and innovation into gold. Here's what that means.

95% of our products have been refreshed, recast and improved over the past two years. About the only thing to do with documents we haven't made better is the paperclip, and we're working on that. 2/3 of our equipment sales revenue is from products launched in the last two years, 49 new products last year alone. In 1959, a Xerox machine could produce a page in one minute. Our latest full-color digital production press can run over 110 unique pages in that very same minute. This is an amazing pace of development but one demanded by the marketplace from both competitors and customers.

The intriguing question, I think, for those gathered here at a conference about future trends is this: how we encourage, manage and deliver this level of productivity? We've already seen that it is not enough to have a good idea or even a hundred if they do not get translated into real value to customers who are willing to pay for it. How do you do that?

The first element is measurable discipline. This is a difficult one to hear for people who are dreamers, contrarians and intuitive entrepreneurs. But it is absolutely essential if you plan to build a business that can keep up with the minimum speed limit of 200 miles an hour these days, even in the right lane. This discipline has to do with two areas: problem solving and

processes. Several years ago, Edward Deming alerted American car makers that the Japanese car companies were on their way and suggested that the reason why they were going to pass the Americans was because of a process initiative called Total Quality.

Xerox embraced the principles of that idea and eventually became the two-time winner of the prestigious Malcolm Baldrige Award for Quality. But that's history. Today we are fully engaged in the adoption of what has become known as Lean Six Sigma, especially the "lean" part, as we feel the pressure to be as efficient as we are effective.

I'm sure you're familiar with Lean Six Sigma, a method to measure and evaluate processes, to learn from our colleagues and to foreshorten the time from an inventive or innovative idea until it becomes profitable. The people who are on the ground doing this work around the world – at engineering and manufacturing centers especially – are called Design for Lean Six Sigma black belts. We have 60 of them with 900 Green belts being trained. Their job is not just to address inefficiencies, but also to make sure that productive people and teams are getting rewarded.

In a while, Lean Six Sigma will undoubtedly give way to another method of process evaluation and discipline called something else. Technology itself will aid in that transformation. The point is this. If any business is going to meet the future with confidence, the leaders and managers must undertake due diligence and look hard at their processes for efficiently getting things done. The first Xerox machine was 21 years in the making. Ten years ago, it took us seven years to bring a new product to market. Today, we measure the time in months, in part because we have paid attention to the boring stuff.

But when you're talking about the maintaining and encouraging the creative impulse behind invention and innovation, behind the single ingenious golden idea and the gold of return on investment through continuous innovation, you have to do more than have good processes. You have to have good people.

And... you have to release them to be their best. I would say, and so would many others, that when Xerox failed, it was because the flow of good ideas was stifled by a management that didn't know how to trust people. The job of management is not to control people but to enable them. And to enable them you have to understand them.

I said at the beginning that inventors are often contrarians. They are also risk takers. The great John Watson, chairman of IBM, opened a meeting

with his top managers by announcing, “Gentlemen, we are not failing enough.” What he meant, of course, was that IBM was growing complacent. It was not risking enough.

In a study by Jack Goncalo of Cornell and Barry Staw of the Hass School of Business at the University of California, subjects were divided into four groups, two made up of individualistic thinkers and two made up of collectivistic thinkers. They were asked to generate solutions for the same problem. The individualistic people – people more like inventors – were better at coming up with ideas than the collective thinkers. The study concluded that creativity by its very nature, may result from the violation rather than the enforcement of shared norms and procedures. So if you want inventors to prosper in your organization, you have to give them the room and the resources they need to work.

At the same time, innovation, those smaller but significant steps, often comes out of teams thinking together about a problem. Teams can bring the knowledge of several disciplines together. You need both inventors and innovators. And of course, none of it is neat, so there is a synergy between invention and innovation going on all the time. And that’s all to the good.

So how do you encourage this?

One huge factor is borderless communication. At Xerox, we were an early pioneer of Wikis that has evolved into something we call Eureka, an Internet based tool box that is being added to every day. It is a way for Customer Service Engineers to share solutions to difficult repair problems. In fact, Xerox has launched Eureka in 75 countries, helping to solve 350,000 service problems in a year, saving us approximately \$15 million in parts and labor. We’re going beyond repairing machines. There are over a dozen internet Wikis that have everything in them from product data and engineering workflow to new product ideas.

But there is more to do. John Seely Brown, who was once Xerox’s chief scientist is now passionate about what he calls, “Creating a Culture of Learning.” He wants an infrastructure to support learning and creativity in the organization. We haven’t entirely figured this out but I know for example, that IBM has encouraged their learning culture by creating a host of corporate blogs whereby their inventors and innovators can contribute ideas, can come together on line to collaborate, and play off one another as an idea is developed. As an idea grows through innovation, it may be that an inventor will see things from a completely different angle – will see the tomato instead of the picker – and a leap forward will be born.

These days, communication through the Internet is THE way for employees to make sure that ideas remain active and global. Smart use of the internet is also a way for management to release their employees to do their best work. It is also an acknowledgment that younger workers learn and communicate differently than their older counterparts. Management needs to support these new ways.

The final thought I'd like to leave with you about managing invention and innovation has to do with customers. In the first instance you have to pay attention to them. In the second you have to benignly ignore them. Let me explain.

Philip Mayfield of Digital Computers, a friend of mine, was reflecting the other day on two recent innovative products that have come on the market. One is the neat Segway Scooter, you know those sort of motorized bath scales, that were invented by Dean Kamen and are supposed to have everyone zip around cities. Well, Segway got all geared up to have 2000 of the things roll off the assembly line every day.

There was one problem. No one wanted them. Headlines followed: Segways Banned from British Streets, Sidewalks, Roads, The Times of London. Segway Scooters Recalled Again – Myrtle Beach Sun News. And the reviewers also had their say: Jeff Foust of Space review said.

Segway demonstrated a different kind of failure: the failure to meet overhyped expectations, the failure to compete effectively against cheaper alternatives; in short, a solution looking for a problem.

By contrast, there's Chips Ahoy Cookies.

Kraft observed not what customers might like to do, like buzz around on a whizzy scooters, but what they actually did: transfer cookies from packages to jars. So they invented a re-sealable bag that would keep cookies fresh and provide an instant ad with every cookie. Since its launch in 2005, the sales of cookies sold in this packaging has doubled the sales of the previous package.

That is certainly the best way to turn innovation into gold: first make sure that it is addressing and meeting customer need.

At Xerox, we've been considering our business customers' needs in an area that we're sure are of interest to them: document related costs. We've found, for example that businesses around the world spend

anywhere from 10% to 15% of revenue on document related costs. That's three times the amount they invest in Research and Development.

Remember the phrase "paperless office?" Kind of ranks right up there with World Champion Cubs or "death benefits" – it just ain't gonna happen. 80% of knowledge supporting worker activities and 90% of customer communications is still done with hard copies. And a recent study by IDC Research Company showed that typical knowledge workers spend about 37% of their time dealing directly with documents. They spend 54% of this time looking for information and 50% of the time they don't find what they need.

In other words, documents are important but they're wasting time and money. Xerox is determined to do better. We know that customers need and want better ways to deal with documents right now in order to reduce costs and improve efficiency.

Every one of those 49 products we introduced last year and every one of the innovations that are packed into the products we have brought to the market over the past two years, meet customer needs. They are easier to handle, faster and are designed to have the machine wear out before the paper jam light does.

But, you know, helping people handle, store, copy and deliver documents today is only part of the answer.

Do you remember I said sometimes you have to benignly ignore your customers? Here's what I meant.

Harvard professor Clayton Christensen has made a fortune as a consultant telling companies to ignore their customers' needs. His inventive and contrarian thinking is outlined in the book, the Innovator's Dilemma. He says,

[Quote] Precisely because these firms listened to their customers and invested aggressively in new technologies that would provide their customers more and better products of the sort they wanted... they lost their position of leadership. [Unquote]

In other words, they failed to anticipate customer needs that customers could not imagine. Two quotes are useful here.

Henry Ford once said, "If I had asked the people what they wanted, they would have said a faster horse." What he gave them instead was horsepower of quite a different kind.

Another quote I like that Christensen uses is one from Wayne Gretsky, the greatest hockey player that ever lived. When asked what made him such a good player, he said, "I never went to where the puck was. I went to where the puck was going to be."

In Xerox's case, if we just continued to make what we know people want, better technology to handle the documents they have, we could well lose our way.

Why? Because we would fail to consider the tomato.

The solution lies not in the machines that handle the tomato or the document. It lies in the tomato and the document itself.

Think of it this way. Documents are knowledge containers.

Now, cargo containers know where they're supposed to go... they're encoded with the information they need to reach their destinations and they let inspectors know what's inside.

But information containers don't know much. Documents are easily produced and filed but they don't have a clue where they're going, who needs them or where they are in their lifecycle. And so valuable documents – the very document someone needs to put their hands on to spark that innovative solution – is lost -- a holy grail lost in the cave of a paper mountain.

It doesn't have to be that way.

The way ahead is not just to make smarter machines but to make smarter documents.

As we see it, Stage One Document Management is making know-nothing documents smarter.

Stage Two is managing documents better because they are smarter.

And Stage Three is make documents capable of managing themselves.

They lock themselves away from people who should not see them. They recognize when they have information that is valuable to a particular regulation or process. And they make themselves available to people who need them.

Let's consider for a moment the issue of security. Your business no doubt has sophisticated digital security measures in place. You no doubt have

strict rules for your employees about only leaving laptops in the trunk of the car and never giving out password information.

But what happens once the print command is sent? What about those documents that your networks, servers, desktops and laptops produce? In 2007, it is estimated that 4.5 trillion hard copy pages will be printed in businesses around the world? Some of those are very important, sensitive documents that in the wrong hands could have disastrous consequences.

It's really not too much to say that hard copy documents have legs. And when they walk out of the office door, they pursue a life of their own. Dumb documents can get into trouble. They need to be smarter than they are.

One way to do that is with Glossmarks which are a kind of inexpensive hologram that can be printed on a document so you can tell the difference between an original and a copy. They're easy to see and they cannot be deleted or reproduced.

You can imagine the mischief and confusion that is avoided with giving a document that kind of provenance with no additional printing step and with information imbedded such as names, time-stamps and company codes.

A similar technology called Data Glyph works like a barcode but is better looking and far more powerful. These barely visible, securely embedded codes can tell you where the document came from, where it should go when scanned and even reconstruct the document if it's damaged.

Let's go a step further. What if there was an RFID, a Radio Frequency Identifier in the document? RFID closes the gap between electronic printed security and knowledge and makes the process seamless. Now the document will tell you where it's been and what has happened to it along the way. If only we could have an RFID for teenagers...

There's more. These documents can tell you who printed it and whether it has left the building or not.

Still not satisfied, Xerox scientists are working on linguistic and content analysis so that tagged information is only decipherable to authorized parties and will thwart prying eyes. Everything from electronic invoices to faxes to legal discussions will soon have this ability.

It is not just a matter of security either. Smart documents, like smart kids in school, need to be able to raise their hands when they know the answer. That means taking hard copies that are already out there and

putting them back into a digital form, but this time, making sure they are in the correct electronic file drawer.

We are absolutely committed to something called categorization. It's a way to have a document associated with subject categories that a computer learns from a "training set" that someone has established by hand.

So when someone tries to search through the hundreds of pages a company has on file, a document will have the ability to say, in effect, "I'm here and I have information you need. Pick me. Pick me." Moreover, once a document is categorized it can route itself to the right person's e-mail box or to the online document management system, all automatically.

Xerox installed its Categorizer for a European customer. We helped them scan and categorize 6 million pages of paper into digital form, building the largest and most accurate database of its kind in the world. Now instead of searching tiers of filing cabinets, they can find what they are looking for... electronically... in seconds.

Documents like tomatoes have changed, but in the case of documents, for the better. Companies now need to adopt a holistic document strategy that goes from creation to printing to use to storage.

The future belongs to companies can turn inventions and innovations into gold. I've tried to outline those very practical management strategies that can help make it happen: due diligence, boundry-less communication and paying attention to customer needs, both those needs customers know about today and those they cannot yet identify.

But there's one more element that's crucial and I'll end with this. For a company to be truly innovative, it has to be a fun place to work. I don't mean parties every day. But I do mean a place where there is a shared sense of adventure and a kind of optimism that encourages people to follow the unexpected.

Maybe this story will illustrate my point.

Chester Carlson who invented the Xerox photocopy machine eventually became a millionaire. Sometimes there is justice.

But he remained as unconventional as ever right up to his death in 1968. He tried to give his wealth away by funding peace and civil rights movements and other projects that ran against conventional wisdom.

One afternoon in New York City, Carlson, by then badly crippled with arthritis, saw a young man selling balloons.

He slowly walked over to the vendor and bought every balloon the man had. Then, holding his colorful bounty by their strings, he strode into a park...

And he let them go.

Thank you.

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