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Innovation as Part of the U.S. Corporate Culture: Innovation Working for You

*Dr. Ronald Mitsch**

I am going to share with you some insights into 3M in terms of innovation. I hope that this will give you a good understanding of what it means to us, how it is woven into the fabric of the company, and what has led to that culture.

I am going to talk a little about innovation, what it is, establishing the culture, and, as I said, driving toward the 21st century in thoughts and processes, and in the innovation strategic planning process.

First, innovation, what is it to me? I have an advantage in this game. I was born in St. Paul, Minnesota, and my next door neighbor was one of the early inventors of 3M, and another friend of the family was the pioneer of nonwovens at 3M. I was growing up, these guys would be around, and they would have a hot swatch of their latest invention in their pocket. They would bring home things like seed-tapes for victory gardens in the 1940s, or grass mats, or nonwovens, or what have you; always a new idea and something to play with.

So as I was growing up, they led me into two directions. One, a real interest in this company called The Mining in St. Paul. And also, to become a scientist. It was clearly one of my dreams come true, when several years later I was hired into 3M. These two guys were still working there, and we became very, very good friends. Both of those folks have died in the interim, but their legend lives on in the company because of their innovativeness and creativity.

To us at 3M innovation is a relatively simple thing, and it comes down to three words: see, think, and do. It is not just a process that relates to product; it relates to process, and to marketing. See, think, do. See what others have seen. Think something differently. And, in our context, that usually means combining technologies, combining capabilities in a novel and innovative way to solve a problem, or create something new. Then, do something about it. The world is full of people who walk by, see things, and think there is a problem, and even come up with solutions. But then they go merrily on their way, and they do not do anything about it. I mentioned Mother Field's cookies. She saw a need for a cookie. She offered a cookie. She did something about it and generated a very, very successful business. So many things

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The following text was compiled from the transcript of the oral presentation made by Dr. Mitsch at the Conference.

happen like this.

A doctor who is doing surgery every day says to himself, this instrument, if it was only curved a certain way, would be a lot better to do this surgery. And so he gets somebody to make him an instrument like that. He sees it, he experiences it, he thinks something differently, and then he does something about it. Hundreds of other surgeons do the same surgery every day, and think there should be a better way, but they never do anything about it. And these guys, these ladies, make an invention, try something new, and the next thing you know, another doctor sees it and says, that is a good idea; let me try it; and pretty soon it becomes commercialized; a company springs up. There are thousands of stories like this. See, think, do. It is a pretty simple thing, actually.

Now, this relates to solving customer problems. Sometimes you see, think, do when a customer says, I have got an issue. I have got a problem. Can you help me solve it? One of the early inventions of 3M was masking tape. The world never had a pressure-sensitive adhesive tape before masking tape was invented. Think about it. One of our people was in an automobile plant where they were using 3M sand paper, and they were painting two-tone cars. They smeared glue on newspaper, stuck it on the side of the car, and then they painted. But it was difficult to get off. So the guy said, there has got to be a better way. He went back, got some paper, developed a pressure-sensitive adhesive by formulating different resins and things like that. He went back to the auto plant and the workers said it is great, but you cannot curve it. Back to the drawing board, he got crepe paper just like the crepe paper you use for decorations. Why crepe paper? Why, because you can bend it around corners! Masking tape was invented as the first pressure-sensitive adhesive tape ever. Customer problems and unarticulated needs.

3M also invented reflective sheeting, the stuff that is on reflective signs, like the octagon red stop signs. The world did not cheer and ask for red octagon retroreflective signs. In fact, when I grew up in Minnesota, I can remember signs being painted yellow, green, and red on wood. Now there are world standards for red octagon stop signs. 3M tried to invent a road marking tape, but we could not get it to stick to the pavement well enough. So we put it on a sign instead. Now, it is sixty years later. 3M created that industry. We are still the market leader no matter where you go in the world. This is an example of responding to an unarticulated need.

3M invented the first disposable face mask, the first presensitized litho plate. 3M invented copy machines. 3M invented magnetic recording media and functional fluorocarbons known as Scotchgard.[®] The list goes on and on; Post-It[®] notes, and categories of products that the world did not demand. See, think, and do.

Now I would like to talk for a moment about some further exam-

ples of innovation. In 1960, the slogan of the company was: "Research is the key to tomorrow." It is an internally focussed concept, but nevertheless a powerful concept. And by the way, the year I joined 3M, the sales were \$550,000,000.00. And last year [1994], we just finished over fifteen billion dollars worldwide. In fact, we had a billion dollars worth of growth last year. Believe it or not, we also had a billion dollars of new product introductions last year.

Then several years ago, we changed the slogan and the logo. This was the company's slogan: "Innovation working for you." And it is a very important change. Not "research is the key to tomorrow." That is an internal thing. This says innovation working for you. Whether it is in sales, or marketing, or R&D to solve problems and create opportunities, it is an external and customer-focused concept. We will solve your problem with innovation.

And finally, today it is just: "3M, innovation." And you will see how intricately entwined these concepts are. I have used a number of examples in this presentation so far. The first was Wet-or-Dry® sandpaper. That was the product that really changed 3M; this was an important event. 3M, after twenty years or so, was really only a second-rate sand paper company. We were using poor minerals from Lake Superior for our sandpaper. It was a floundering company. But then there was an invention. There was a patent. And it was Wet-or-Dry® sandpaper.

For the first time, that allowed a response to a need in the automobile industry. And interestingly enough, it was an environmental product in 1920. The automobile industry wanted to go from dry sanding to wet sanding using water. None of the competitive sandpapers available could be used. I know sandpaper is a pretty boring product compared to high-tech things, but our customers wanted to use sandpaper wet to keep the dust under control.

The invention of Wet-or-Dry® taught 3M some very, very important lessons. And that is differentiation, proprietary position, and what we say is changing the basis of competition. Changing the basis of competition is having patented proprietary positions and differentiation from the other competitors. Mr. McKnight, who was then the chairman, understood that difference and drove that forward, and from 1920 this has been part of the fabric of 3M. The company has been recognized externally relative to innovative ideas quite extensively. I thought I would just mention three or four of these examples.

The company has been ranked in the top ten of the *Fortune* survey of America's most admired corporations. The company has been called "masters of innovation" by *Business Week*, and ranked third behind Sony and Mashusta in Japan by Japanese executives. There were only two companies named by Japanese executives in the top ten as model companies: Hewlett Packard and 3M. And then, most recently, we have been mentioned in the books on innovation by Peter Dugger and

Tom Peters.

I want to talk about the culture of innovation, and I have five quick transparencies. I mentioned Mr. McKnight who has just been inducted into the Business Hall of Fame this year. He was our chairman for that period of time, and this is one of his quotes having to do with an aggressive research policy. Carlton was the next chairman, and he said, "no company can rest on its laurels. It either develops and improves, or loses ground. Our company has adopted the policy of research and business pays." Moving on a few years, Lou Lehr in the 1980s, made a very important point. "For every successful product and innovation, there is a management sponsor." Somebody that gave the employee degrees of freedom, the fifteen percent time, the mucking around in the swamp to allow an idea to nurture and come along. Mr. Jacobson said a couple of things. "Research and development drives 3M in satisfying customer needs, and we are a manufacturing company." It is an important point. We are a manufacturing company. Jake was the chairman for five years. And finally Desi, "our primary driving force in which we will continue to invest to sustain innovation."

I would like to talk about what I feel our success formula is and where came from. It came from going back through the annual reports of our company published in the 1940s, the 1950s, and the 1960s. I read those reports several years ago in a very, very critical way, reading the words of the pioneers, the managers, and people in the company. What was the basis for these inventions and the big success of the company? Basically there were about a half-a-dozen things. First of all, invest and build on the core competencies of technology platforms. Nothing new there, but it needs the degrees of freedom, the permissiveness, and the financing to respond to these things; not just to shape it in a certain way, but to allow it to spring up and then to build on these technology capabilities.

As I said earlier, emphasize the idea of differentiation, of innovation, to allow people to rub around against customers, to get into the back room, to see, to think, to do, and combine your technologies in unique ways, either to solve customer problems or satisfy unarticulated needs.

Place heavy emphasis in proprietary positions. We routinely call for an in-depth patent study on our major programs. We always have the normal check lists, and patent filings, and what have you. But several years ago, I took the position that on the really important programs and things we call our "pacing programs," we have our top intellectual property lawyer, Mr. Griswold, form a little team to come in and do an in-depth analysis on it. Because it is important, if you are doing innovative things in "changing the basis of competition" and creating business and creating change, you need time to make those changes happen. What that does, of course, is establish proprietary po-

sitions to give you time to create a market. Often there is a decade of market development work that is required to get into things. Then leverage our strengths, our manufacturing processes, our inside technology, and our market positions. Enter segments where we can win. That sounds so simple.

In other words, the market is ready for change. Take Post-It® notes for example. Nobody demanded Post-It® notes. Nobody wanted Post-It® notes. Conventional market research said it is a lousy idea. But once you got it in the hands of users, and they started to use them, they became addicted to them. Hopefully tape flags will be the same. Those flags say "sign here." Lawyers love those little flags! So do I.

One of the most exciting new programs that we have going on right now is in the CFC replacement area. Another has to do with abrasives. We have just invented and introduced this week [April 1995], in fact, a totally new product in the abrasives field. Remember, that is our oldest business, and yet through innovation, a whole new manufacturing process was created, and a new product was introduced that gives double the life, double the cut, and a finer finish than anybody has ever seen before. The idea that is so powerful to me is that you can re-create and re-energize something like sandpaper. Obviously, this suggests that there is not an industry or business that we should not expect to be changed by that kind of innovation.

This is the reason we are still the market leader in reflective sheeting. It is not because we invented one product years ago and it is still there. It was the introduction of a product we called Engineer-grade, and then one that was three times brighter, called High-intensity, then another one that is four times brighter again called Diamond-grade. Some people call it bifurcation and being able to anticipate the unarticulated needs of the customer. And then, of course, augment it with external actions, such as acquisitions, licenses, equity investments, and so forth. This is really the pattern in every one of our successful businesses.

Now, the next point I would like to discuss includes what we call "walking the talk." Understand your success formula, including proprietary position, changing the base of competition, and "walking the talk." What does that mean? It means at 3M everybody knows that part of our job is to change the basis of competition, to innovate, and to re-create your business. Not just through new products, but new processes, new marketing approaches, going to market in a simpler way, innovative financing devices, and, of course, a strong intellectual property position.

We have four financial objectives for the company. They have to do with earnings-per-share growth, return on capital, return on equity, and new products. Thirty percent of our sales is from products introduced in the past four years. It is deep in the culture. Every general

manager knows it. Every technical director knows it. Every employee, including technicians know that new products, and re-generation, and innovation are the culture and the fabric of this company. And we celebrate. Our research and development vice president reports to the chairman. We believe technology belongs to 3M. The product belongs to divisions. So if I have a need for expertise in a technology over here, I am not restricted. I can go and get it. I can ask people to help me solve a problem and offer their expertise in a completely different part of the company.

Carlton or Carlton Society, is the academy awards of 3M. There are some seventy-five, or so, members of the Carlton Society which recognizes outstanding technical achievement. There are two or three people singled out on an annual basis and it is a "big deal." This is an amazing event. So is our Golden Step Award. We just had the 1994 Golden Step Awards Ceremony. We are talking about recognition of innovation. Seven hundred and fifty people and teams were recognized. There were 750 people there. The chairman was there. Every member of the operating committee was there. The group vice-presidents were there. And when these people were recognized, there was cheering and applause.

A similar kind of recognition is called the Technical Circle of Excellence. This is for individual contributors. There are twenty contributors selected for recognition from nominations including a thousand or so people. Imagine being in a room with a thousand people, and they read the contributions of an individual, and a spotlight finds that person in the room, and he or she walks to the stage to be congratulated by the Chairman and Vice President of Research & Development. People come up with tears in their eyes. Everybody knows how important this is. "Walking the talk." There are many of these kinds of programs that really bring it alive.

A few years ago, our then Chairman Jacobson observed that we had things going along pretty well, but there was change in the air. And he said, he was sure that we can do better in terms of getting more out of our R&D investment. Several of us took six months and came back with a set of recommendations that we called the R&D imperatives. It laid out ten recommendations for enhanced R&D in the company. I will just mention six of them here. Of course Q90, which is our quality program based on the Baldrich criteria; time compression, or speed to market; and technology platforms. Understand which technology platforms are going to create your future; the 21st century for your company.

Those were identified, about ten or twelve of them, and they are having a profound impact on the new products growth in the company now; a growth portfolio. In our sector we have a very clear understanding of the 100 best opportunities in the sector. They are identified on

one sheet of paper for each group. It is a very simple approach, but effective. Some of the programs have a box around them. Those boxes designate the programs that are proprietary, differentiated, and change the basis of competition, because those are the ones that are going to create new divisions of 3M.

Part of this also was an intellectual property strategy, a much more intense intellectual property strategy than we have had in the past. It also includes environmental programs, and finally, the idea we refer to as "pacing programs." Now I am moving into "driving toward the 21st century."

The idea of pacing programs is a simple concept. We asked our business units to identify the programs that are the most important initiatives that *must* be accomplished to enhance our competitive position and provide quality growth. Most divisions have no more than three or four of these. They could be a marketing or a service initiative if you are in the retail business, or a new product, new process, or what have you. These are our pacing programs, and the staff groups love to help support these important programs. You get extra innovation, inventiveness, and size, speed, and pace of the market. We have fifty-seven of these in our sector right now; fifty-seven pacing programs. They have close to a four billion dollar market potential. When we met with the security analysts, I described eight of them very briefly. I said, these eight programs will deliver somewhere between one billion and one-and-a-half billion dollars. It is a 100 million dollar average. These are not enormous programs by world standards, but when you have fifty-seven of them, they add up.

People have asked me, what is your strategic plan all about? Well, you can have books, but most businesses can write it down on an envelope because what you really want to know is, what are you doing to upset the status quo, to really change the rules of the game in your business arena, and increase your value to the customer thereby resulting in a powerful and novel competitive advantage that is really difficult for competition to respond to? When you have that, and you understand what it takes to do it, no matter what business you are in, you have got a winner, and you have got a successful business. Tell us how you are changing the basis of competition in business. It does not matter whether you are in the auto industry, tape industry, or the chemicals industry.

One thing we find in the company these days is that we are preserving this aspect of being a technology innovation and new product-driven company, and we are becoming much more experienced toward a market channel and customer basis focus. We continue to drive the innovation aspect, but then compliment that with the element of really focusing on the customer. And this has led to the vision of the company, which was adopted last year, and it has really two themes to it.

The first point has to do with the idea of 3M as the most innovative enterprise, bar none, in the world. That is what we are saying we should be. But secondly, being the preferred supplier with the idea that every impression of 3M and its employees is a positive experience. And that means every interaction, every phone call, every product, and every shipment.

I hope that I have given you a good idea of how important innovation is to 3M, some examples of it, and how it has become woven into the culture of the company. I am going to finish by just taking a quote out of a recent book. If you have not read this book, *Built To Last*, it is probably worth your while. It is quite easy reading. The book describes the chronicle of some sixteen companies and makes comparisons and contrasts between their styles. In this book, the authors say, "If we had to bet our lives on the continued success and adaptability of any single company in our study over the next 50 to 100 years, it would be 3M." Quite a compliment, I would say, and quite a compliment to the theme of this meeting; of innovation, of culture, and of creating a commercial aspect of that by seeing, thinking, and doing.

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