

Can You Imagine? Would You Believe!

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Opening the Show!

My wife and I recently went to see the movie, "I Walk the Line" the life story of the legendary Johnny Cash. Taking in the movie brought back memories of a time long ago when we went to see "The Johnny Cash Show" in person. It was a classic example of "show business", the auditorium was packed, the crowd was robust, and you could literally feel the excitement and anticipation for the show to go on. The then young, and unheralded, Reba McEntire was brought in to warm up the crowd. Reba was great in her own right and is now a mega-star herself, but back then the fans were waiting for the "Man in Black"!

It is common in show business, when a major concert comes to town, to bring in a budding star to open the show, to generate some additional excitement, and to set the stage for the "Main Act". That is what we see happening now throughout our economic world as new technology of the first order is ready to come on stage.

Some might say, "I have already seen enough, stop the world, I want to get off", However, the show will go on and opportunities for building our future economy will focus on the ideas of today being translated into products and services of tomorrow.

Don't Ever Become a Commodity.

There is something extra special in show business when a new sound, a new look, or a fresh approach is presented to the customer. So, too, in the business world customers continuously look for products and services that better meet their needs. Hence, there is a constant drive to improve what we do. If we do the same thing over, and over, and over, it becomes a commodity and once a commodity it invariably ends up being supplied by the lowest priced provider.

William Hickey, CEO of Sealed Air Corporation, states that innovation is a preventive medicine for the deadly disease: commoditization. Their company believes that there is no such thing as a commodity. Their goal is to continue to find ways to make their products non-commodities through added value, differentiation, and innovation.

Sold out events in show business or in sports happen because the customer is excited about what they are to experience. Yogi Berra states "if people don't want to come to the ballpark, you can't stop them!" So in our industry if we are constantly providing new and fresh ideas through value added design and engineering our customers will continue to beat a path to our door.

Change Like We have Not Seen Before.

The late Harry Quadracci, founder of Quad Graphics, once stated, “change is our bread and butter, doing it better than everyone else is our job security.” How true this is. Too often, we see change as instability and it threatens us. When in fact, we ought to be threatened when there is no change going on as that is when competitors swoop in and eat our lunch.

It is not just new and enhanced products. It is also incredibly improved processes and cost savings that keep you in the game. Gary Hegstrom, manager of the Nortech Corporation’s Bemidji operation, stated to a Rotary group that they “have had to reduce their costs of products ten to fifteen percent a year in order to keep their customers. If they are not able to do it the vendor will go somewhere else where they can.” Gary relates that once you meet these needs that you actually become more competitive and your capability and capacity continue to increase!

Similarly, Pat Bonnie, General Manager of the Seagate Technology operation in Bloomington, shared with us when we were touring their state-of-the-art facility, (this facility manufactures the recording heads that go into hard drives), that “they have reduced their costs of production one percent a week... for fifteen years!” With 52 weeks in a year and over a period of fifteen years you might logically ask yourself, “how in the world can they still be in business?” The answer is, that the fact that they did it is why they are still in business!

Smaller, Faster, and Unimaginable Quality.

Yet, what we have seen to date is just the warm up to what is going to be presented on the “main technology stage” of tomorrow! Those who are tracking the breakthroughs propose that we will experience 17 of them every minute of every day. That projects to about 25,000 new ideas a day and close to 9 million that we will have next year that we don’t have today! Two professors in California summed up all the new knowledge generated in the year 2002 and found that it would take one half million “Libraries of Congress” to hold it. Or, they state that if every person living on Earth today contributed their share, 6.4 billion of us, each one would have to generate a “book shelf” 30 feet long!

Just to give us a tiny peek at some of the breakthroughs that are arriving on the horizon we can take a look at what is on the “program”.

-Carbon Nanotubes. (CNTs) These materials have long held great promise as building blocks for the next generation materials and electronic devices. Lighter and stronger than steel, CNTs can also conduct electricity well. Scientists in Texas and Australia have recently outlined a process to spin CNTs into sheets.

This ultra light material, an acre’s worth would weight as little as 4oz, has potential uses in everything from space sails to light-emitting displays, and artificial muscles to transparent radio antennas.

-Solid Smoke. Aerogels come out of NASA research and are incredible insulators. Billed as “solid smoke” because of its light weight and enormous surface quality, it could keep your coffee hot in a thermos bottle after being in the deep freeze for days. A piece of aerogel the size of a grape has the same surface area as two gymnasium floors!

-Not a Hemi. TECHNOTrends, (7-04) reports that Berkley labs have constructed what may be the world's smallest motor. The synthetic rotational nanomotor is about 300 times smaller than the diameter of a human hair and future versions may be up to five times smaller. The carbon bonds that connect the components are virtually frictionless, so the parts never wear out. The tiny motor can hold up under extreme environments and is unaffected by radiation. Developers have measured its speed at 33,000 cycles per second and believe it is capable of reaching up to a billion cycles per second!

-Bio engineered materials...bio steel, Early research at the University of Wyoming resulted in the ability to genetically engineer “spider fiber”. This material is the “dragline” that the spider excretes when dropping from a surface and begins spinning a web. It is 5 times stronger than steel, 30% more elastic than nylon and absorbs more energy than Kevlar. This bio-engineered material is being produced in larger quantities now by inserting the gene of the spider into the embryo of a goat. When the new goat is born, matures and produces milk they spin the spider gene protein out of the milk and put the product into numerous new products.

-Nano-stethoscopes. The Jet Propulsion Laboratory at NASA has developed a super-sensitive “nano-stethoscope” that can pick up the metabolic sound of individual cells. Following the pioneering work of Nobel Prize winner Ivar Giaever, scientists can now fingerprint various cell conditions, growth, internal movement, repositioning of the medium, all producing unique electrical flows and thus their own sound pattern. Researchers believe that they can hear a sound for a primary tumor cell and from one that has spread from elsewhere. Dr. Luong of the National Research Council's biotech lab in Montreal and in collaboration of the Robarts Research Institute in London, Ontario, expect to have the beginnings of a sound library in six months.

-Programmable tattoos. Interval Research Corporation has patented a process called by some as a “programmable tattoo”. The first use would be a “watchless watch” but with biosensors to monitor body temperature, heart rate, blood pressure, other devices will follow closely behind.

Speed to Market

John Chambers, CEO of Cisco Systems relates that in our current marketplace, changes that once took place over a decade now take place in one or two years.

Chambers elaborates this point by stating that the first wave will occur and you might have an advantage for three to five years. But your competition will copy you, and as they copy your things will be bundled, commoditized and then be offered free. So you had better be on your second wave before the first wave disappears. If you are looking to get paid back in five to ten years in what you are doing, you're going to get killed.

Exquisite Design/Build on the Fly.

In order to meet the demands of the customer we have to not only exceed their expectations but we have to also offer exquisite design and we must build it on the fly. This concept has been in the construction industry for decades. When a skyscraper is to be built there is not time to have the full design in place prior to starting construction as it would take five or more years to do so and inflation would eat up the project. So the major design and engineering decisions are made & approved, contracts signed, and the project commences. Then, as the skyscraper towers into the sky the designs are continuously taking place to direct the contractors and meet the needs of the customer.

Today, in the manufacturing sector, this concept is becoming more of the norm as partnerships are formed, designs are approved and prototypes are being engineered on the fly as companies work in concert with their suppliers to bring products to the marketplace in previously unthinkable timelines.

Ideas, Ideas, Ideas.

It has been proposed that the economy in the first hundred years of this nation was driven by who had the biggest farm. (The agrarian era). The second hundred years relied on who had the biggest factory. (The industrial era). The next hundred years will be led by who have the best ideas! So it is with ideas, we see the ad in our business journals by the Accenture Corporation where a rear view mirror of a car is shown and printed in the mirror is the statement: I AM YOUR IDEA....COMPETITORS MAY BE CLOSER THAN THEY APPEAR!

Colleges, universities, research organizations, governments and industry all know that good ideas are priceless! With that in mind the Ingenuity Frontier initiative is underway in northwest Minnesota. This is a collaborative partnership by the Northwest Minnesota Foundation, Bemidji State University, Headwaters Regional Development Commission, Northland College, and the Minnesota Department of Employment and Economic Development. It has brought together a dozen companies, three foundations, several higher education institutions, five school systems, two new engineering degrees and the new building housing the Center for Advanced and Emerging Technology. The top floor of this new facility focuses on "Imagination & Ideas", the second floor on "Invention & Innovation", and the bottom floor is on "Implementation"...get it out the door. It is an exciting concept for preparing talent for tomorrow and has recently named in the Governor's Centers of Excellence!

Educating the next generation of change agents.

A world class talent pool must start early in our k-12 schools. This calls for much more than a renewed emphasis on math and science but also requires a strong focus on technology. Note that technology is much more than computers, (a single machine), it is acquiring technological literacy at the early level of learning and then takes on the role of “know-how” in such fields as manufacturing, construction, communications, transportation, etc., in high school. We need dynamic technology & engineering programs at the k-12 level that carrying into two year and four year higher education levels and advanced technical graduate education for some. Learning will be continuous as we see more and more people with baccalaureate degrees back in technical colleges gaining applied expertise throughout their careers.

Standing applause, and untold encores!

Once the “grand technology show” comes on stage it will perform in such a way that we will be literally “wowed” in our seats and periodically we will leap to our feet and give the performers a standing ovation! And, when done well, there will be no limit to the encores that we will find ourselves doing!

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