

# Change is Hard: You Go First

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## **Synopsis**

Cartoonist Scott Adams, through his character Dilbert, makes withering commentary about the difficulty people have in dealing with a rapidly changing world. How about you? Are you feeling overwhelmed with the challenge of change? Are you or your organization spinning your tires? Are you convinced that you'll never be able to help move your colleagues along the path from here to there? Why is it so difficult to change personal habits, to modify long-standing professional practices, or to help an individual or organization beyond a fixation with the here and now? And how will we possibly address the future needs of our children if we can't even get ourselves out of first gear?

This presentation explains in simple terms why so many educators are white knuckle about change, and outlines five practical strategies you can use to jump start the process of getting from where you and your organization is to where you and they need to be.

## **The lure of the familiar**

I'll admit right up front, I'm a charter member of a group known as Overusers Anonymous - I have a leather jacket that I bought many years ago while I was still in university (many, many years ago) - I LOVE that jacket and still wear it today any time I get the opportunity even though the jacket has definitely seen better days. It has rips, stains and (sigh) doesn't really fit the way it used to - but no problem, when people give me a bad time about it, I just say that the jacket has character. However, I have to acknowledge that the condition of the jacket has deteriorated to the point where recently my wife has warned me that if I ever leave the property again wearing it, she will personally burn it (with me in it I suspect).

The problem I'm having is that I've spent a long time getting that jacket the way I like it. Sure, I know that I can afford to buy a new one, but I don't really want to. The reason is that I've been rewarded through the initial efforts that were required to break the jacket in. If I bought a new one, I'd have to start all over again from scratch getting comfortable with it and this would take time. Consequently, I'm reluctant (some might say resistant) to making what my wife believes is a necessary change.

Now what gives us comfort in our lives? Really it's different things I guess. But the fundamental issue is not really just about old coats or old shoes. Think of that old couch that has certainly seen better days as it has descended down the feeding chain from the living room to the den to the basement and out into the garage. In fact, it's not just about things. It's also about different ways of doing things - new ideas - alternative worldviews - looking at things from a different perspective.

It's not that people are fundamentally opposed to change - it's just that change requires effort, and change causes discomfort to those who are asked to change. And besides, when you get right down to it, we all try to avoid discomfort if at all possible.

In much the same way, new technologies have changed how things are done - and for a large portion of the population, these changes have made them feel uncomfortable. Beyond this, many new technologies requires a great deal of effort to master. Consequently, in many sectors of the population (not the least of which is education) its use is naturally resisted. As a result, the introduction of the use of technology is often limited by a desire for personal comfort. In order to overcome this resistance, people must learn to differentiate between power of the technology and the mindsets that guide its use

### **So what's the problem.**

So, is there a problem? In education, superficially at least, it really doesn't seem like there's much of a problem - it appears that we're on track. The use of technology by educators is starting to gradually surface in the classroom and a new way of teaching is slowly appearing. But if the implementation of technology into the educational experience is limited by our desire for comfort, it also leaves room for our competitors - it's just that in education we don't understand that we have competitors or that public education might be at risk. Many educators believe that change is something that happens somewhere and to someone else - to

steelworkers, factory hands, loggers or miner - but not to us in education. However, the grim reality today is that no country is an island. There seems to be less and less time to adjust to what appears to be more changes & more power.

**So what's the answer?**

Strange as it seems, the answer is NOT technology. The key to success in the rapidly changing world of today is PEOPLE; and the key aspect of people is PARADIGM

**So what is paradigm?**

Paradigm is a mindset. Paradigm is what you value. Paradigm is the way you see things. As an example, think back to the first time that you saw this picture.



Personally, I remember becoming completely frustrated when someone said there were two pictures - that of an older woman and that of a younger woman. Try as I may, I could only see the picture of the older woman. Then suddenly, my focus changed and there they both were. Once I knew how to change my focus, it was easy to move back and forth between the two images - in fact, it was hard to imagine that there was ever a time in my life when I couldn't see them both. My paradigm had shifted. Many people have had the same kind of experience working with the new 3-Dimensional pictures that have recently appeared.

### **Paradigm and real life**

Imagine the mind-set of the farmer in 1908 who relies on horses for transportation. He is in his wagon behind reliable old Bessie, a strong mare with the ability to pull the farmer and his supplies all the way home. On the way, both are startled by the sudden appearance of a noisy motor car, chugging along on its own power. As the motor car leaves him choking in its dust, the farmer swears at the folly of such technology. If we ask him whether this automobile will have a significant impact on his life, he would not hesitate.

Absolutely not, he would tell us. Not only is there not enough gasoline around for these cursed horse-less carriages, no one knows how to fix them when they break down. More important, he says, there is not enough room on the road for both motor cars and horses. Since building separate roads for motor cars is impractical, it is likely these blasted things will be gone in a year or two.

From here, we can see his mistake. The automobile and its spin-off technologies changed everything. This new technology, at first seen as such a bizarre invention, had an impact in every part of industrialized society. But from where that farmer sat that day in his wagon, none of this was possible. His mind-set, his paradigm, would not allow him to see change even when it roared by him on the road. It's very possible to look at something and miss its true significance because your mind-set or paradigm has not equipped you to deal with this new situation.

The digital watch is another example of how paradigm can have a major impact on perception. The introduction of electronic watches in the 1970s produced one of the most startling shifts in business in the 20th Century. Before the digital watch was invented, a watch was an analog device based on gears and springs with the time displayed by continuously moving hands. Most of the world's watches were produced in Switzerland.

This is the paradigm: watches and clocks had looked and worked the same way for literally hundreds of years. The mind-set for watches was that they looked a certain way, and they had certain capabilities. This paradigm all but killed the Swiss watch industry.

When the first digital watch was invented, the response from the Swiss and other traditional watchmakers was fascinating. They did very little, and so they lost most of the world market for watches they had held for so long. Japanese competitors

saw the potential for the digital watch, marketed it to the world, and took the world market for watches away from the Swiss.

Before we judge the Swiss, we should stop for a moment and reflect back on our experience with the graphic on the previous page. If we initially focused on one of the women, we probably had difficulty seeing the other. We might also have dismissed anyone who said they did. Our mind-set was preventing us from perceiving the entire significance of what we saw.

With this in mind, it is much easier to appreciate the response of the traditional watchmakers to this new electronic watch technology. These new devices were a radical departure from what watches had looked like for a long time. Some simply dismissed them as toys that would have little or no real impact on the industry. Besides, how could they possibly approach the quality and accuracy of fine Swiss watches? This new technology didn't even have hands! It was hard to even consider them as real watches.

By relying on their old paradigms, the Swiss were blind to the true power of the new electronic watch. This was a critical mistake for the traditional watch making industry. Within a few short years, the global watch market shifted to the orient, as sales of electronic digital watches overtook and then left behind the now old-fashioned analog watches. Swiss watchmakers hardly knew what had hit them. Unable to compete, their response had been crippled by the paradigm they held for their industry.

### **Paradigm paralysis**

Today, society as a whole in North America finds itself in a very similar situation to the Swiss watchmakers described above. Astounding developments in communications, computers, entertainment, household appliances, product design and manufacturing presents us with an enormous challenge to our mind-set for how life should unfold, a challenge with incredibly high stakes. Our economic survival depends on our ability to change our paradigms to meet the changes racing toward us.

It's like a chain of dependence. Our continuing viability depends on whether companies can adapt and keep pace with their global competitors. This adaptability depends on our educational institutions and our ability to continually equip people with the relevant skills they need for the rapidly emerging life of the 21st Century.

This chain of dependence relies on the ability of all its players to change paradigms as needed.

Incredible advances in technology are staring us in the face. We don't want to find ourselves missing or ignoring significant developments and going the way of Swiss watchmakers. We must embrace technology and use it to its fullest potential. The only way to do this is to let go of obsolete technologies and mind-sets as we move forward. If we cannot do this, we face the prospect of a drastic downward economic slide into a lower standard of living because we cannot compete. Paradigm paralysis is hindering our response as we ponder the impact of new technology. This problem is so significant it must be given full attention as we attempt to tackle this enormous challenge.

The problem is our inherent picture of the way we think life ought to unfold. More specifically, the major problem is the paradigm of people who lived their most impressionable years before the explosion of electronic technology into everyday life. The reason for this lies in the way that technological development has occurred over human history.

The number of new, more powerful developments coming at us today is astonishing. This was not always the case. In fact, for much of history, technological development was very slow. If you look at the development of computational technology over time, for example, you will see that most of our ancestors had quite a long time to get used to technology that was not particularly powerful.

People who grew to adulthood before the microcomputer came into its own understood their grandparents had seen more unbelievable change during their lifetimes than all the generations before them. They had started with horses as a major mode of transportation and lived to see man walk on the moon. Still, that rate of change is nothing compared to what is coming. The amount of change humanity witnessed during the 60-year span from 1940 to 2000 will accelerate over the next several years. Some say the change that happened during that 60 years will continue, only it will be compressed into 20, 15, 10, even five years.

People living today are experiencing a most extraordinary period of human history. The overwhelming majority of the development in the quantity and the power of computational and communications technology has occurred over the last 60 years. This has created a situation without precedent in human history.

Previously, advances in technology have first been understood and then implemented by adults, who taught their children how to use them. Now young people are better able to change their paradigm and to embrace this new age of high technology. The young grasp the potential of new technology first and the young are now teaching older people how to use it. Older people are struggling to catch up and keep up. Young people today live a substantially different paradigm than their parents. They may not be able to articulate the difference, but they know the life they are living is unlike that experienced by those who are older. A major paradigm shift has taken place, creating something much more significant than a generation gap. Most important, this situation has happened in less time than it takes to create a new generation.

Now we can begin to understand the incredible potential for paradigm paralysis that exists in North America today. Young people may be living the new paradigm for life, but who is in control of most of the world they experience? Who makes the decisions in business, government, and education? People who, for the most part, are still operating under an old paradigm for life wield the power. Most of the people in positions of control in North America were born before the early 1970s. When those people passed through their most impressionable years, life was radically different than it is today.

People born before 1970 did not experience an electronic world in their youth. Their world view, their understanding of society, their perspective on the structure of things was created in a world radically different from the world of today. The world they experienced was based on an industrial model for life. It did not teach them how to integrate "smart" electronic devices into their lives. It did not teach them how to get new information visually. They did not learn the implications of instantaneous global communication. The life they experienced did not equip them to handle the world we now see unfolding before eyes.

The paradigm paralysis we face today is a direct result of the unparalleled shift technology has created since 1970. We face the prospect that people who do not understand the full implications of the changes taking place are making decisions. It is also likely the decision-makers are resisting change in the same way some people resist buying a new coat. The old ideas that shape their worldview are comfortable and to change would bring unwelcome struggle. This is a prescription for disaster.

### **But that's not me!!!**

There are others who will deny that suffer from paradigm paralysis. Because they were born in an age of technology, they feel that they must be exempt. The bottom line is that everyone has a paradigm - everyone has a comfort zone - and thus, everyone suffers from some form of PP regardless of our age. As a result, we must all face the challenge of unrelenting change.

Why? It's because the world keeps changing. We have to constantly deal with new technologies - new products - new ways of doing things - new ways of thinking. What are the old days to a 25-year-old? Before his family got its first VCR? What are the old days to a 16 year old? Before she/he got their first video game? What are the old days to a 4-year-old?

### **The challenge of change**

The challenge of change is that it confronts the established ways of doing things. What was once valued suddenly isn't valued any more. And when confronted with new development, we often defend what's familiar while criticizing what's new and invoking the Silliness Syndrome. Be careful about saying that's crazy, that's ridiculous, stupid, laughable...that it will never happen. Be careful of feeling exempt from the effects of change or becoming a Yabbut (yeah, but it won't happen because of....) - often this is just your paradigm speaking.

Be certain of this - regardless of your age, regardless of what it was like when you grew up - regardless of your comfort zone - regardless of how "informed" you feel you are - continually letting go of your existing paradigm of life - of getting beyond your comfort zone - will be your greatest personal & professional challenge as you move through the 21st Century.

### **So where did these paradigms come from?**

Our paradigms are programmed by our life experiences. This happens at an unconscious level. You see this all the time - consider where you sit in a staff room or workshop after a break. Most of us automatically return to exactly the same place we sat the last time we were there or we sat before the break. This is an unconsciously programmed action. We don't even bother to consider that there may be alternatives. That's not necessary because we have a paradigm - a comfort zone.

Everyone creates their own unique routines - consider the morning ritual we follow when we get up in the morning - what we eat - how we eat our breakfast - how we

take our coffee - the time we leave house - the route we follow to work. Many of these routines have become automated because a long time ago we decided this was the best way to do things - we became unconsciously programmed - there was little need for thought or effort.

Other routines are created by cultural or social traditions - the way we drive - the way we speak - our table manners - the hours we work - the school calendar - these and many, many more have become embedded & unconscious patterns.- our paradigm - our set of rules. They define our boundaries and tell us how we need to behave in order to be successful and to function effectively.

### **And then suddenly...**

Our world changes. And when this happens, it forces us out of our unconscious automated patterns and we are compelled to take an action that's not routine - we have to do something for first or only time - we drive new car - we take up new sport - we have to use some new device - or have to put together something that requires "some assembly."

Whether we're forced to do something differently or doing entirely different things, it's initially hard because we must think about it before proceeding. Information must be processed and decisions must be made. This requires more mental effort that we are used to which makes us feel uncomfortable or stressed. This is why we avoid change.

### **Why does it make us uncomfortable?**

Discomfort doesn't happen when things are *normal*. Predictability & programmed decisions make things manageable. Some non-programmed decisions make life interesting and acceptable as long as no life or pattern changing decisions must be made. Other unanticipated changes suddenly reveal themselves to be better or more attractive than previous ways of doing or thinking about things. Now you may be wondering how this applies to you?

### **The way things were...**

Most of us are children of the late Industrial Age. Do you remember those days? Do you remember when life was stable & predictable? Let's take a quick stroll down memory lane to a time when we all followed familiar and comfortable daily routines. Like many of my friends, my Mom stayed home primarily to raise the children and maintain the house. My Dad came home at the same time every night. We sat down

for dinner at the same time every night. Sunday was for Disney and a bath. There was an incredible steady rhythm of life - things lasted long time - change was predictable and manageable.

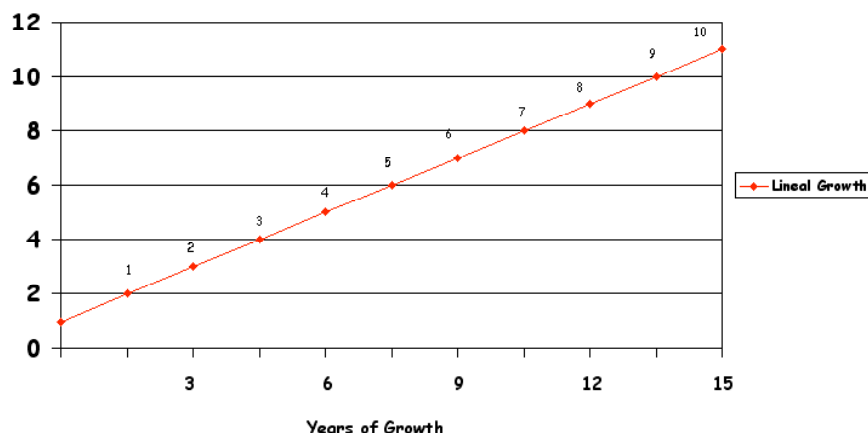
In much the same way, school was predictable. There were programmed decisions for how things worked. School was a relatively stable environment that required us to work hard and apply ourselves, but there were no sudden, life-changing events or decisions. The majority of us grew up in such an environment, but now things have changed. Life not following the same predictable patterns it once way.

This is due in large part to new technologies. Technologically driven change has led to an accelerating rate of change that has brought with it a new set of rules and new ways of doing things. For many that come from a time and place of relative stability, these changes have been bewildering & disorienting. You may not see this rapid change, but it's happening everywhere - in our businesses, in our families, in our communities...

### Incremental vs. Exponential Growth

To understand incremental change, consider for a moment the nature of linear growth. When things grow in a linear fashion, the growth is very predictable. If something were growing in a linear fashion, by a factor of one every 18 months, the linear progression would be 1-2-3-4-5-6. . Over 15 years this means that something would be 10 times as big, 10 times as fast. 10 times as powerful ...

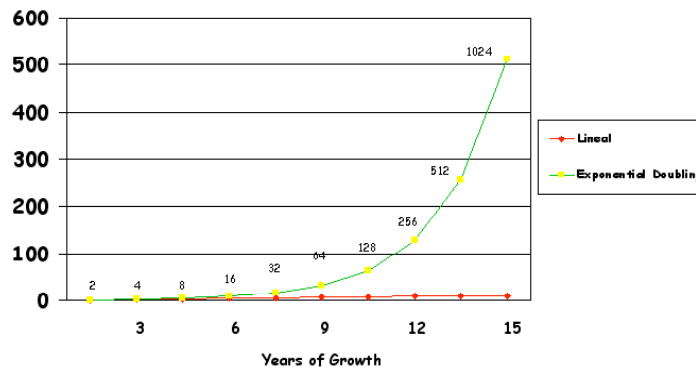
#### Lineal Growth



### Understanding exponential growth

Now consider linear growth versus exponential doubling. If something were doubling in size exponentially every 18 months, the exponential progression would be 1-2-4-8-16-32... Over 15 years, this means that something would be 1000 times as big, 1000 times as fast, 1000 times as powerful ... an amazing amount of growth, a larger and larger amount of this happens as the power of the doubling kicked in.

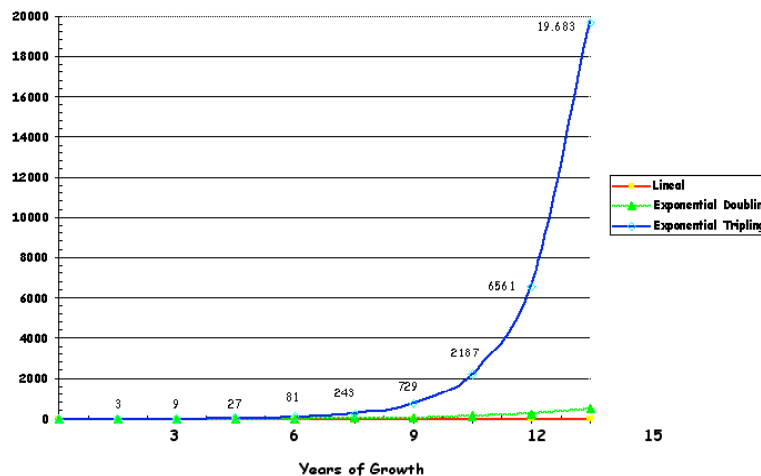
Lineal vs. Exponential Doubling



### Exponential tripling

Now consider linear growth versus exponential tripling. If something were tripling in size exponentially every 18 months, the exponential progression would be 1-3-9-27-81-243. Over 15 years, this means that something would be almost 20,000 times as big, 20,000 times as fast, 20,000 times as powerful ... and once again, a larger and larger amount of this happens as the power of the tripling kicked in.

Lineal vs. Exponential Tripling



### Why is this important?

Exponential growth just hints of things to come. Let's examine five exponential trends that no one can ignore.

#### Trend #1: Moore's Law

Gordon Moore was the co-founder and chief research scientist of Intel Corporation, the leading manufacturer of microchips for computers in the world today. In 1965, for years before Intel was created, in Electronics magazine, he proposed Moore's Law. The law suggested that the processing power and speed of any electronic calculating device doubled every 18 months, while at the same time that the price for that technology declined by about 50% relative to the power during that time frame. This is exponential (as opposed to lineal) growth. So far, Moore's prediction has been uncannily accurate, but it's very hard to grasp the significance of Moore's Law because the mind simply can't keep up. Let's take a look at how Moore's Law has impacted on the power of technologies. Take a close look at the table, below, first developed by David Thornburg:

## Hang on!!!

<b>Twice the power for half the price every 18 months</b>				
Year	1979	1984	2001	2013
RAM	16k	128k	128mb	32,768 mb
Hard drive	128k	400k	12gb	3,072 gb
Speed	2mhz	10mhz	600mhz	153,600mhz
Cost	\$5000	\$3900	\$1000	\$14

Some people look at the figures for 2013 and shut down - they just can't believe that this will happen. It's the same for us - sometimes we don't believe us. But think about it for a moment - anyone remember the first calculators that came out in 1973 - they had four functions - add, subtract, multiply and divide - and they worked pretty well as long as you didn't have to carry. They were also pretty large - you almost had to use a wheelbarrow to move them around.

Recently while traveling through an airport, Ted saw a Lloyds, full function, solar powered calculator for 95 cents. You see, in exponential times you cannot view new technologies for what they are. You have to understand them as part of a continuum from where they have come from to where they are going.

Then take Moore's Law and combine it with trend #2...

### **Trend #2: The Law of the Photon**

Consider for a moment - how fast is fast? Does anyone remember using a 2400 or 9600 baud modem (please - no one laugh hysterically)? When you jump to 28.8 or 56 K modems, the speed increase is pretty incredible. Anyone experienced a cable modem - whew!!! Blows back the hair.

Or how about a cable modems chugging along at 10 megabits per second -that's a CD-ROM in 60 seconds. A CD-ROM represents a secretary typing at 100 words a minute, 60 minutes and hour (we know, we know - this is fantasy!), 8 hours a day, 5 days a week, 52 weeks a year, for more than 12 years (Lucent commercial).

Is that fast? What about fiber optics - 10 gigabytes per second traveling down a single strand of glass fiber - 16 CDs per second - that's everything that Shakespeare has ever written (he hasn't written a lot lately has he?) translated into 200 languages and sent from New York to Los Angeles in .0043 seconds. (Lucent commercial) Is that fast? Well, at the Lucent Bell Labs in New Jersey, they are pushing speeds in excess of 5 trillion bits per second or 1000 CDs per second down one single strand of third generation hollow glass fiber.

But if you think that this is fast, you need to get over it. George Gilder, a widely respected and quoted futurist from New England says in his latest book *Telecosm* that we need to deal with the Law of the Photon. The Law of the Photon tells us that since 1983 when the first fiber line was installed between New York and Washington, DC, bandwidth speed and capacity per dollar has been tripling every 12 months. Gilder further asserts that this tripling will continue for at least another 20 years. If it does this, bandwidth speed will increase during that span by in excess of 1 billion times. If this is the case (and there is little reason to doubt that it isn't) this means that today we are literally in the Stone Ages of optical communications.

Then add to the equation the recent emergence of wireless access. While it's still relatively slow, within the next few years we will see the emergence of Ultra

Wideband - close to fiber speeds wirelessly through the ether. This has profound implications for all of us.

Fiber, wireless and coaxial cable are truly the concrete and steel of the information highway and the near and distant future of global information economy. And while things are changing rapidly, it is safe to suggest that the technological and informational transformations of the past 10,000 years will be absolutely dwarfed by the transformations we will experience in the next 3 to 5 years of our lives. These changes will have a profound effect upon the way we work, the way we play, the way we communicate and particularly, the way we learn. This pushes and will continue to push our mindsets.

### **Trend #3: The Internet Revolution!**

It's hard enough just having to deal with Moore's Law and the Law of the Photon. But then combine this with the subsequent emergence of the Web as a commercial force in our lives. Do you remember when you could actually look at a newspaper or magazine and NOT see some gee whiz articles about the amazing potential of the Web? Do you remember when surfing was done outdoors? When Java was something you drank with milk and sugar? When you didn't have to know what the @ sign was for? When you could actually turn on a show or watch a movie and not see <http://www.spend.money>? It's hard to believe that our world was a simpler place a little more than 5 years ago.

But then, everything changed in the summer of '95, when using the Web went from something done by geeks to a sign of being cool.

Overnight, it went from being a specialized thing done by propeller heads who spent their time waxing their modems to get higher speeds to something deeply embedded in the public consciousness. In '93, there were no users of Web - this was mainly because Marc Andreessen, the creator of Mosaic, which eventually became Netscape and then was bought out by AOL, had just graduated from high school. Now, according to the latest statistics (February 2001) use is just exploding. First, the existing Web continues to expand at a phenomenal pace. In just the past 24 hours, 3 million new Web pages, 196,000 new Internet-access devices and 147,000 new Web users were added. By 2002, there will be more Web pages than people on the planet. There are estimated to be more than 300 million users in 170 countries. And it's projected that there will 1 billion regular users by the year 2005.

Conservatively, in terms of pages of content and Internet traffic, it's estimated that the Web is doubling in size every 120 days, which means that conservatively it is doubling in size 3 times per year! If this is the case, more than 80% of the sites that will exist a year from now don't exist today. This is absolutely stupendous, biological growth - like bacteria or disease.

Things are growing and changing so quickly, that we have to start viewing developments in dog years. One year of Web development is the same as seven in almost any other medium. If we measure Web development by this standard, it's been more than 2 centuries since the Internet was born, more than 60 years since the emergence of the Web; and by the year 2002 (5 staff development days away) the Web will have undergone another decade of growth & development

Then combine this with the explosion of E-mail. Current estimates (June 2000) are that more than 15 billion e-mail messages are sent daily in the US alone -this figure is anticipated to reach 17 billion e-mail messages daily by the year 2003. Email use is estimated (Oracle ad) growing at 1000 times the rate of conventional mail. Access to the Web combined with use of e-mail has lead to a fundamentally new mindset for many people. Until recently, cyberspace was only for propeller heads who spent their lives sitting in the ethereal glow of a computer screen getting a great tan while drinking Jolt Cola and eating Hostess Twinkies while waxing their modems for higher speed. Now, it's a middle class suburb. And the amazing thing is that this has happened in a world where it's till going to cost you \$1000 by the time you've bought your computer, modem, software and service access and where downloading files is, as Jim Hargreaves, David Thornburg and others suggest, literally like trying to suck peanut butter up a straw.

But stand back for a moment and consider where things will go tomorrow when we see the appearance of little \$500 network and handheld devices in combination with new products and services, and growing awareness of the power and potential of on-line communications. Where's do you think that usage is going to go? Is it going to go down or is it going to go up?

Look, we still aren't there yet. There's lots of criticism about slowness, security, under/over regulation, and system overload. But we need to get over it. These things will eventually be resolved. Just like the early telephone system, things aren't perfect yet, not all have the necessary access, it's not always easy to use...but despite all of the "Yeah buts", this thing is coming at us like a freight

train. In just more than 6 years, it has reached full-fledged status as a commercial medium. It is probably the dominant communications medium for next century - as MIT's Nicholas Negroponte suggests, a veritable 10.5 on Richter scale of social significance - and so, it's almost impossible to overstate its importance of what's happening.

But it doesn't stop there. Taking Moore's Law, the Law of the Photon, the emergence of the Internet together and you get...

#### **Trend #4: The Age of InfoWhelm**

Directly because of computers, growing bandwidth and networks, the number of words, terms, concepts generated are doing at an absolutely exponential rate. Looking at this in real terms, there are estimated to be about 540,000 words in the English language, which is about 5 times as many as there were in Shakespeare's time. As a result today we are dealing with a raging torrent of information. It's estimated that there was more new data produced last years than in the previous 5,000 years. More than 3,000 books published daily which explains why we feel so inadequate when someone asks us if we've read a new book and we haven't even heard of the writer.

Futurist Richard Saul Wurman, in his book *Information Anxiety*, stated that a weekly edition of the *New York Time* contains more information that a person was likely to come across in a lifetime in the 18<sup>th</sup> Century. He estimated that in one year a person will read or complete 3,000 notices & forms, read newspapers & magazines for 234 hours, watch 1571 hours of television, listen to 1056 hours of radio, listen to 269 hours of recorded music, talk on the phone for 361 hrs, go online 43 hours read books for 96 hours and spend 15 years of their life talking. In essence, we spend most of our lives working & exchanging information in some form. Michael Crichton, author of *Jurassic Park* suggests that the average adult today spends more money on food for thought than on food for the body.

A recent study from the University of California at Berkeley states that the amount of unique information being generated is beyond our ability to comprehend. It estimates that 1.5 exabytes of unique new information is generated worldwide each year - an exabyte is a 1 followed by 18 zeroes - 1,000,000,000,000,000,000 bytes of information. If this were stored on floppy disks, storing the information would require a stack of floppy disks 2 million miles high.

That translates into a library of 250 books, 250 MB of data or half a compact disc for every man, woman & child on the planet. It's estimated that 93% of this information is stored digitally and then anyone connected to the Internet will be able to gain access to virtually all of it within next two years

George Gilder says that we live in an age of disposable information. He says that the amount of unique new technical information is doubling every 2 years (and he further asserts that this will shrink to every 2 weeks by the year 2005). This has led to a fundamental depreciation in the value of technical information to the point where he suggests that if you were to consider a student who just graduated from high school and had started a four year technical degree or college - that half of what they learned in their first year of study would be outdated, obsolete, or just plain wrong by the beginning of their third year of school. Under such circumstances, what's your personal rate of depreciation?

#### **Trend #5: Technological convergence**

Technological convergence happens when what have previously been separate technologies fuse together to create powerful and unique new devices. What's happening right now is the fusion of four powerful and distinct technologies. These devices are television, interactive real-time communications devices, computers, and networks. This is a fusion that is so powerful that we've been compelled to give it a name...synercation.

#### **What implications does all this hold for education?**

It's time to rethink things because we are at a great crossroads. These developments have profound implications for the future of learning - classrooms - the curriculum - courses - what it means to be a teacher - to teach - the role of technology in learning - how we assess learning - and for that matter why kids need to come to school at all?

#### **So what do you think about all of this?**

Do you feel unsettled? Are you disoriented? Frightened? Challenged? Excited? In denial? Do you think that this will never happen? Do you think I'm crazy? Do you think that I have drinking problem? Stand back for a few minutes.

### **Rapid change creates pressure...**

And when it does that, it pushes us out of our comfort zone and puts extraordinary pressure on our existing paradigm. In particular, new ways put everyone practicing old ways of doing/viewing things at risk. As Ted McCain points out, the better you are - the more time you've invested in an old paradigm, the more you have to lose by changing. This is because change confronts our desire to be comfortable. Discomfort hinders ability to grasp the need for change - and this results in paradigm paralysis. When our desire for comfort combines with a number of programmed decisions, it can prevent you from seeing things properly. At times such as these, you need to be careful of *Yabbut* or "*that will never happen*"

### **Why education is particularly vulnerable**

The relative long-term stability in education has led to a remarkable resistance to change. Many educators have a big comfort zone that comes from what Bill Spady calls our "*eduentrism*" - from the fact that most educators, as a student, student teacher, or teacher, have spent their entire life in the school system. As a result, the way schools are has become our native language. Consequently, many teachers are running on autopilot - acting on programmed decisions. But while educators continue to invoke TTWWADI (that's the way we've always done it) the world keeps changing.

As this happens, the pressure on education is building. There's a growing gap between where things are & where things need to be if schools are to reflect the realities of this changing world - between what learners are leaving our schools with and what they need to cope with this changing world.

Rest assured this gap won't continue for long. If what's happening in the rest of the world is any indicator, we can expect corrections that will be swift & devastating - we can assume that the new directions will extensively use technology - and we can guarantee that the solutions will go outside the public school system.

### **How do you deal with the changing horizon?**

How do you deal with tomorrow. Futurist James Crupi tells us that there are 3 kinds of people - those people who make things happen - those people who watch things happen - and those who suddenly say "what just happened?" We have no choice but to be people who participate in the change - who deal with the future - because everything else is the past. So how do we do this? What we're going to suggest is four strategies:

### **Looking For Your Sacred Cows.**

Author Robert Kriegel has written a marvelous book entitled "Sacred Cows Make the Best Burgers." Sacred cows are those things that are accepted without question in our lives exactly for what they are. What are our sacred cows? Our sacred cows are the programmed decisions we cling to because they make life easier for us. They're the things that define our comfort zone - the things we feel can't be touched because, on a personal level, they define who we are.

The problem with sacred cows is that they can bite back. The programmed decisions can hinder our personal & professional growth because they are accepted without much thought. As Kriegel points out, we have to be careful because our sacred cows can prevent us from seeing things from a different perspective, which can lead to paradigm paralysis.

Consider for a moment. Are there programmed decisions you hold sacred? Why do you hold them sacred? Is it because of a deeply held conviction...or is it just the continued desire for comfort? Let's go looking for educational sacred cows! Would they include: chalk & talk instruction; full frontal lecturing; seeing the teacher as the expert; a dependence on content-based written/multiple choice tests; a reliance on textbooks & worksheets; clinging to favorite lessons; seeing it as the teacher's role to do all evaluation; how we assess students?

What about our educational structures? How about the length of school day/year? Attendance policies? Teaching credentials? Working conditions? Major changes to a particular program? The elimination/combination of traditional disciplines or areas of study?

Why are we asking this? Why is this important? It's important to find out our automatic, unconsciously held and strong views of what should be. It's important to examine the thinking behind your programmed decisions, because it's the only way to find out how much comfort lies behind what you do as this will give you clues as to where future stress may originate from and how flexible you will be when, as inevitably will happen, you are asked to change?

### **Becoming Teflon**

Many people hold on tightly to their habits and stubbornly cling to old ways. This leads to resistance to change & inflexibility which inevitably leads to increased stress with pressure to change. We must all learn to let go before things stick. A

deeply, unexamined attachment to something can be extremely dangerous.

Urban anthropologist Jennifer James tells us that to cope with rapid change, you have to think in future tense - to understand that the present is nothing more than the past of the future. In several of our presentations, we use the term "Living Life Like a Quarterback" - simply put, understanding that the quarterback must throw the ball to where the receiver will be, rather than where the receiver is.

Quarterbacks understand that in a time of constant, exponential change, the world is a moving target - that there is an increased role of intuition - because today is only as useful as a pointer for tomorrow. As educators, we must acknowledge world is changing- has already changed - and use this to consider the implications of a world on move. The problem is that most people get totally hung up with the here and now - getting ready for the next day, the next week, the next month. That's completely understandable - but at the same time, we have to try to be split screen - not just dealing with the here and now - but also visualizing where the future might take us. Making a reasoned extrapolation of that future based on the emergent trends of today and trying to anticipate where the change will come from.

So where to begin? Start by considering the rationale behind your programmed decisions. Are you willing to let go of outdated thinking? At all costs, be careful about unconsciously invoking TTWWADI, Yabbut, "that won't work", "that's impossible", "it can't be done", or "I don't like this", because each and every one of these may be nothing more than your paradigm talking.

More than anything, it's about learning to become Teflon - of being willing to let go of things before they stick (what we call organized abandonment) - it's about applying the principles of composition/decomposition (for everything you add, being willing to let go of something.), organized abandonment, and composition/decomposition - it's about a willingness to let go of your existing paradigm of life.

It's important that you accept this principle, because, like it or not, obsolescence of your existing paradigm is guaranteed. The reality is that we must all be willing to constantly reconsider, undo & reinvent our thinking. It's no longer just about doing a good job - in a rapidly changing world, it's also about doing relevant job. No one wants to be in the position of doing the wrong thing well because there is no interest or market for obsolete excellence. In this environment, all of us, no matter how much experience we have - how "informed" we are, how "enlightened" we are -

we all must be ready to continuously change & learn - to become Teflon - or run the risk of becoming irrelevant.

### **Focusing on the Process of Learning, Not Just the Product of Learning**

Products come & go - only processes remain in times of radical change - this is a direct result of exponential growth. Understanding processes is the power behind modern thinking - processes empower - it's the difference between fishing for someone and teaching someone how to fish.

When I think back to my days as a classroom teacher, I realize that in the beginning, I was far more interested in learners getting the right answer (the product) than I was with them understanding the process. Remember, "invert and multiply" - no explanation why, just do it. It was only years later that I finally understood that kids need to develop process skills, not just final product of their or their teachers' thinking.

But many educators continue to focus on products, essays, reports, and tests, often to the exclusion of teaching the processes that underpin them all. It's been our experience that many librarians want to teach the process of doing research whereas many teachers, driven by the tyranny of time, the curriculum guide, state standards, and their existing paradigms, just want to get the materials and get on with it, because they've just gotta get it covered - just gotta get the kids ready for the next, topic, grade, level of education while dealing with parental expectations, traditional evaluation models and multiple levels of multiple-choice tests - the test on Monday; the test at the end of unit, the term, the year; state & national exams, university entrance exams...

Processes rise above all of this - a focus on the process of writing, reading, problem solving, decision-making, research plus individual and team processes. It is a deep understanding of processes that will help the Millennium Generation become searchers, implementers, performers, problem framers, problem solvers, innovators, designers, producers, and contributors - self-directed learners who can perceive, comprehend, learn, reason, analyze, assess, interpret, organize, plan, predict, design, intuit, create, invent, perform, produce, construct, mentor, partner, teach, communicate, and value. You see content comes and goes; only processes remain the same even as technologies & procedures change in this time of radical change.

### **Viewing success as an enemy**

Huh??!!! I'm sure you're wondering what the heck we're talking about. The bottom line is that success tends to breed complacency, stifle creativity and as a result makes us less competitive. Think back to Stanley Kubrick's movie 2001, A Space Odyssey, which came out in the late 60's - what airline was the one used to get passengers from the Earth to the Moon - why it was Pan Am of course - flown with them lately? Of course not, they've been out of business for some time now - but back in 1969 they were the biggest in the world - that's why it made sense for the producers of 2001 A Space Odyssey to use them. When was the last time you shopped at a Woolworths? How about bought a computer from Commodore? At one time, each of these companies was at or near the top of their field - but not anymore. In fact, if you were to take a list of the Fortune 500 from December, 1985 and compare it with the Fortune 500 list for today, you would discover that more than 300 of the companies on that original list are no longer on the list - in fact, many of them no longer exist.

Viewing success as the enemy is the basis for considering who really won WW II? Whose economies were we chasing through most of the 80s and 90s? Germany and Japan. How could this have happened?

At the end of the war, Americans returned home to an economic infrastructure that was completely intact and took up basically where they had left off. Meanwhile in Europe and parts of Asia, where little of the pre-war economic infrastructure remained, we saw widespread destruction and the related desperation that tends to accompany devastation.

In order to survive, these countries were forced to start thinking outside the box in order to reinvent themselves. At first, at least on the surface, very little happened - as an example, in the early years, most of the products made in Japan were little more than cheap, imitation junk ... but that's certainly not the case anymore. Suddenly in the 70's we stopped buying American built cars, refrigerators, stereos, TV and other manufactured goods, and started buying Japanese products - was it because the American products were cheaper and better made? Obviously this was not the case. Complacency had set in for many American industries and it finally caught up with them.

In Tom Peters book Circle of Innovation, he describes the strategy for the 90's as "change direction & run like hell". More and more people are beginning to realize

that it's almost impossible to make huge changes in short period of time. As Tom Peters says, "you can't leap a chasm in two bounds" - you either leap it all at once or down you go.

More and more institutions choose not to operate from the "all or nothing" mentality and instead focus on the "kaizen" or CANI (constant and never-ending improvement model.) This model stresses that the way to bring about meaningful change is to try and change one thing in our daily practices every day or week, and to compound them - keep doing the things you changed differently, while changing one more thing in our practice - when compounded over a course of weeks, months and years, this can bring about profound, systemic changes.

The golden rule of the future is that change is the only constant. Whether we like it or not, change makes us feel uncomfortable (in fact the only people who don't experience stress are dead people) so you have to view discomfort as friend? If you're comfortable with where you're at, you're just not moving. All of us must learn to accept the looming affront of change. It's like a wave, we must learn to get up on top of it and ride or run risk of becoming permanently embedded as part of the beach as the wave sweeps over us.

To do this, we must persistently work to become continuous learners who welcome failure. In these times of radical change it's been our experience that we learn more from our failures and mistakes than from our successes. Outside of education this is widely understood. Management guru Tom Peters says that "the essence of innovation is the pursuit of failure" - that failing is good. Success can lead to sacred cows. We must learn to focus on our failures, because failure is strong indication that you are trying something new and different - that you're moving - that you understand the principles of productive/useful failure and the poorly rule, which states that anything worth doing is worth doing poorly in the beginning...as long as you learn something in the process.

No matter where you are, never, never stop - when success is reached, take a moment to congratulate yourself, and then start over. Robert Kriegel says it best - "if ain't broke, ...break it!

Stop and consider for a moment when the last time was you failed at something? Remember that the only thing worse than aiming too high & missing mark is aiming too low & hitting mark every time.

Two wonderful things happen when you open yourself to embracing change. First, you avoid paradigm paralysis and in doing so, you become a role model for your students. As you begin to practice this, students start picking up the new basic skills needed to survive in this wildly changing world. This is all because you're managing change in you life and moving from talking to walking change.

**So what's stopping us from moving ourselves & our schools there?**

This is not about money or time - it's about vision, choices & priorities. The challenge of change is more of poverty of attitude than it is a poverty of dollars. As Bernajean Porter says, it's a myth that change takes time; rather it's the decision to change that takes time.

But in order to get there, all educators must get beyond victim myopia - that they can't change because they don't get enough staff development time, that they don't have state of art resources to put in the hands of every child & teacher, that they can't do anything because the state dictates the curriculum, that they have to prepare students for college entrance requirements, that it's the school board's responsibility, or that they don't want to change because they only have two years, 6 months, 5 days, 3 hours and 23 minutes until retirement

Yes, change is hard!! Yes, it's easy to have a sense of complete overwhelm & hopelessness with the magnitude of the task

So how do you overcome it? By taking one step at a time. No matter how hard you work at it, how well you are prepared, how enlightened you are, discomfort is guaranteed. But we must persist - our children's futures (and our pension plans) depend on it. Overnight successes are years in making

**Where do we begin?**

It doesn't start with rhetoric. Rhetoric is not the language of change. Rhetoric in and of itself will not work. Rhetoric alone can't reform schools.

Consider for a moment the definition of insanity... "Doing the same thing we've always done, but expecting or needing completely different results. Well, if we continue to do what we've always done, we'll continue to get what we've always got, and in doing so we will fail ourselves by failing our children.

So understand, this all starts with you and me - it all starts here and now. We want to issue you a personal challenge - be people who make change happen - and remember that the longest journey begins with a single step - the greatest movement starts with a single individual - if it's going to be...it's up to me (and you)

There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things, because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new.

*Machiavelli, The Prince*

In times of radical change, the learners inherit the earth, while the learned find themselves perfectly equipped for a world that no longer exists

*Eric Hoffer*

Change is the law of life. Those who look only to the past or the present are certain to miss the future

*John F. Kennedy*

If I hadn't believed it, I'd never have seen it

*Buckminster Fuller*

You see things that are and say why, but I dream things that never were and say why not?

*George Bernard Shaw*

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