

Look the Future Straight in the Eye
Generating a Transformation to a Sustainable World
Or
The 21st Century is not for Wimps

Tom Riley
jriley@charm.net
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LTFSITESustain.doc

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Summary:

Our best view to the future shows many trends towards problems of historic levels in the 21st century. We can face these problems and take powerful action toward a sustainable society. Technical people have a key part to play in this action.

By understanding how human beings take on major projects and sustain action on them, we can discern how to address our problems, even those of great size. Our understanding of this process is now well advanced and includes clearly defined concepts of transformation and buy-in.

New science is becoming available that can be directly applied to managing people in or projects to solve of major problems. Much of this science comes from our new understanding of how the human brain works. It is now time to apply these breakthroughs.

We can build a sustainable society. We can start now.

1. A View to the Future

Nothing about the future is fixed. If the future was fixed, there would be no possibility of improving it. The best we can hope for is reliable information on trends and practical tools. Our understanding of the future is limited by deep uncertainty. The one thing I can say with great certainty is that the 21st century is not for wimps.

If you want to look to the future you need a model of some sort: the best model for tomorrow is today. It is rare that things change all that much in one day. People who do not like change use this model without thinking about it and extend it to longer and longer periods of time. The problem starts if you try to use last month as a model for next month. There is a good chance that something important might happen in a month, so saying April will be like February is untrustworthy. If you try to use the last decade as a model for the next decade, your model is worse than useless. Saying the 2010's will be like the 1990's is simply a mistake.

In this day and age our best tools for looking to the future are computer models. A researcher assembles much data about a particular element of society, like energy use, devises mathematical expressions to describe it, adjusts the expressions until they match the historical data, and extrapolates the model into the near future. Such models cannot make predictions, but they do show major trends well.

The problem is that most extant computer models show trends that point toward very difficult social and economic conditions in the 21st century, problems of historic proportions. These include:

1. Hubbert's Peak ^{1,2} or the end of cheap oil, a once-in-200-years event
2. Global Warming ³, a once-in-12,000-years event
3. World Population peaking ⁴, a once-in-74,000-years event that is driving all the others

To address these problems we need robust solutions.^{5,6} We need to use the computer models as tools to provide direction while we work in a dynamic manner adjusting to the every changing situation. We need to get a large numbers of people to be in effective action. You cannot achieve this level of action by simply frightening people. Fortunately, we now have strategies to get sizable groups into powerful action on technical solutions.

Concerning our energy supplies, we are at the end of an historic free lunch: one hundred and twenty years of almost free energy of the highest quality, with little concern for environmental. Now the free lunch is over, but it is not the end of the world.

We can take this lying down, or we can get in action. We can see it as unmitigated disaster, or we can be seen as a great challenge. Such a challenge is ideal for a generation of young people trained on video games. What did they think we were training them for?

The great mass of the world's people are not yet ready to take on the new challenges. That is all right, for there is much work technical people must do to prepare the way. It will probably take a major incident for them to wake up, but when they do they will toggle over with great strength and unstoppable force. When that happens, we will all see the wisdom of the great sage Pogo the Possum, "We have met the enemy and they is us."

Technical people must now lay the ground work for this change. Our population is far too large to reinvent the family farm and move back to the land in mass. We have eaten from the fruit of the tree of technical knowledge, and now we must use that knowledge to meet the new challenges. There is no going back.

This paper will look at these challenges as grand technical projects. We will look at how the pyramids got built and how all really big jobs got done. We will take the engineering approach of applying the latest science to the solution of practical problems.

We do not need a few minor improvements. We need really big breakthroughs and we need a lot of them. In fact, we have bet the farm having big breakthroughs. New science is showing us that this can be done.

2. What we need is a good old-fashion Transformation

We need to change the way we look at the world, to generate a new vision, and to get into action based upon that new vision. This process is very common in human history and is called transformation. The human brain even has specific structures that support this effect.

There are a number of candidate visions currently discussed, but they are fragmentary and incomplete. These include:

1. Sustainable Development
2. Renewable Energy
3. Sustainable Economics
4. Sustainable Environment

At present these ideas seem to be in competition for resources, and this has resulted in proponents of differing agendas cutting each other's throats. This has got to stop. We need an overall vision that can function as an umbrella for all the rest. We may not yet have such a clear over-vision; perhaps it is simply waiting for a leader to speak its name. The likely umbrella term might be the "Sustainability Movement," but it seems very awkward to me. In this paper I will just call this new vision, Sustain, with a capital "S". I define this to mean a vision of a civilization that can sustain itself on Earth indefinitely.

3. Introduction to Transformation

The term "transformation" has been used at least since 1990 to cover a specific approach to handling major changes in corporate and personal life. It covers only major changes that can be described as a breakthrough and is quite distinct from day-to-day small improvements. Transformation is for big jumps that are unmistakably breakthroughs; the process is very non-linear.

3.1. Definition of transformation: "The Vision Thing"

The word "transformation" has a number of meanings. It can be used to mean a major change or even a change in visual appearance only, but to use it for managing change we need a specific technical definition: "a change in a person's world view resulting in a change in action." Transformation is about making breakthroughs happen.

For a transformation to occur, our people would accept a new view of the world and then engage in effective action to implement that view. Transformation turns out to be one of the great forces of civilization and has recent been popularly referred to as "The Vision Thing." Transformation can therefore be used as a specific tool to do the exact job we need to get done.

There have been a number of great transformations of society caused by new science. These include: the Copernican Revolution, Einstein's Theory of Relativity, Quantum Mechanics, and DNA. This type of transformation is the one most readily accepted by technical people. The Internet supported a large transformation but not quite to the level of Copernicus. Fortunately for us, we do not require a transformation of the magnitude of Copernican to generate Sustain.

We use transformation only when we specifically want to make a fresh start with a new vision. It is far beyond mundane fixing things or finding what is wrong. It is an aggressively active effort to create a major breakthrough, rather than to wait passively for one to happen. Transformation is not just the latest management buzz word du jour. The term has rich meaning.

The 21st century is not for wimps! We must face and overcome problems of historic proportions. We need breakthroughs in science and breakthroughs in engineering. Linear thinking will not do for this job. We need to master transformation as a tool for managing great change.

3.2. Philosophic Foundation

The working definition of transformation is derived from the philosophic study called Ontology, the study of states of being. We are most familiar with states of being like happy, or sad, but also we often have to deal with unproductive states of being like resignation and cynicism. Human beings can display a wide variety of states of being, but only one at a time. Your worldview strongly affects your state of being and your state of being strongly affects whether you are active or passive.

We recently saw our people at JPL during the Mars landing experiencing a state of pure ecstasy. It simply does not get any better than that for technical people. This elated state of being is one of the great rewards of project work and keeps people in action.

The only problem with a philosophic foundation, from our standpoint, is that technical people do not like philosophy. Technical people basically feel that they can out think anybody who ever lived and, besides, modern philosophers are off somewhere in never-never land. As we will see later, we now have the possibility of converting formal transformation over to a scientific base.

3.3. Personal History

I first ran across the transformation arguments in a training course I took in 1995. It is called the Landmark Forum.⁷ Their approach is based on possibility and avoiding traps like fixing things or making people wrong. I would describe this approach as aggressively positive.

I completed a dozen or so of Landmark's courses and helped produce a good number of others. I think this approach is a bit too touchie-feelie for most technical people's tastes, and Landmark's documents are proprietary commercial materials and do not come from an open academic heritage.⁸

3.3.1. The Coach from the B Team

There is a powerful way I could help our Sustain effort: to serve as a transformation coach. If you will allow a sport's metaphor, consider for a moment where the great sports coaches come from. Almost none of them were star players. They almost all come from the "B" Team. Star players are running on pure talent and do not have to pay attention to coaching. The second-string players have to listen to the coaches to have any chance of getting play time. Through this process the "B" players learn to be coaches.

The truly great players, like Tiger Woods, have both talent and take coaching. They do this despite the fact that their coach does not play the game at their super-star level. I am a transformation coach from the "B" team who is looking for a leader with raw talent.

That we have a transformation coach among technical people is truly a million-to-one shot. I don't think you should pass on this opportunity. If you think you may have the talent to lead Sustain and would be open to coaching; let me hear from you.

3.4. Schools of Transformation

There a number of schools of transformation used by different groups, with different literature, and taught by different companies. Some are formal; others are simply alternative ideas.

1. Possibility – This is the one I have studied; it focuses on the great things that are always possible and it is based on Ontology.
2. Department of Defense – This is the major change called for by Secretary Rumsfeld to meet the needs of the American military at the end of the cold war. I do not know the base of this program or if that information is public.
3. Appreciative Inquiry⁹ -- This approach focuses on what the organization does well and it has an academic ancestry with the best public documentation. This looks like Ontology to me.
4. Natural Language – This is the default situation that occurs if you take no special action on transformation, but one just happens to you anyway. You simply go with the flow of history and do not waste a lot of time in an expecting-one’s-naval exercise like defining terms. It is based on linguistics; we talk change into existence.
5. Other – There are probably others I do not know about.

3.5. Key example for us: Formal Buy-In

Technical people are project people. We can start work on a project in a single meeting and keep working on it for a decade. We have an intuitive understanding of this process and call it buy-in. Buy-in is the enabling principle of all project work, from the building of the pyramids to the Apollo flights to the moon. The study of transformation provides a detailed explanation and model of buy-in, while most other approaches do not.

Under buy-in, we hear about a new project, we envision ourselves succeeding with the project, we get in action on the project, and we stay in action on the project.¹⁰ President Kennedy’s “We choose to go to the Moon” speech is one of the strongest examples of buy-in in the 20th century. We listened, we envisioned success as a nation, we got into action, we went to the Moon. Most technical people can think of examples in their lives in which they bought into a project and worked on it for a very long time. Buy-in is very effective in moving us from a state of inaction, like cynicism, to a state of effective action and great energy.

3.5.1. Key Steps

If you are a doer of projects, the following explanation of buy-in generation should be easy for you to relate to your personal experience. While reading it, think back to the start of your best project. How did you get roped into it? What vision of success kept you going through hard periods? How did being in action on a project make you feel?

To enable people to effectively generate and accept buy-in requires a step-by-step process, a formal version of buy-in.⁴ Here are the specific steps in the process for inviting people to buy into your idea, as they might occur at a project kickoff meeting:

1. **Paying attention** – When people arrive at a presentation, they are often distracted by things that happened to them just getting there: the traffic is horrible; the weather is worse, here is my excuse for being late. None of this is really important but we do need to get it out of the way. The best way to do this is through language. Get people to talk among themselves before the presentation starts. Work the crowd a little. Do not bother to take notes on what is said; just get them to say anything about whatever is in the way. It does not have to make much sense. Like excuses, once spoken the distracting stuff will fade into the background.

2. **This is important to you** – Get the audience to start thinking about how your idea could make them successful in their lives. This starts the Vision of Success process. Be sure they see the presentation as unusual enough to be interesting, but not so unusual as to be dangerous. In this process, connect personally with the audience. Make sure they know that you are inviting them to contribute to the project and become part of it.
3. **Present the idea** – Here you may use any form of media that the audience will find interesting. These days everything is flashy pictures, which is okay, but they will not do your job for you. The presentation must be inspiring and show your personal commitment. Here is where the skill of being a presenter and, to some extent, the skill of generating inspiration, come to the fore. They are crafts to be learned and practiced.

Examples of how the idea has affected your personal life are usually accepted as important human-to-human communications, but they must be sincere. Over-rehearsed testimonials will put an audience off. Canned jokes and cynical quips can definitely break the development of the idea. If you sound like a TV pitchman or a preacher, then you will be heard as such.

The presentation must have content. It must have information of real value to the audience. Whiz-bang and flash are not enough. Lack of real content was one of the major problems in the Dot-Com boom and bust. In that boom, technical people demonstrated simultaneously that you can build Visions of Success on pure whiz-bang and that a boom built on this foundation of sand will not last.

The presentation must have integrity. Human beings have a specific brain module for spotting phonies; this module is hardwired to an anxiety center. Done poorly, a formal buy-in presentation comes across as a hidden hard sell, and it will then upset people.

Most of our integrity problems come from our saying one thing and doing another. It is very important to be up front about what you are doing and to hide nothing. Early on, you need to find a good way to say that you are intentionally trying to get people into action on your great idea.

4. **Invitation to Buy-in** – Don't use fancy graphics here; you can leave something on the screen, but it must not be very interesting, and it certainly must not be moving around or flashing. The next step must be done in language only. It can be written in text, but is most often spoken. You must assist the people of the audience in envisioning themselves succeeding with your idea. You should then see at least a few eyes light up.

Make it perfectly clear that it is completely all right if they choose not to buy into your idea, but invite them to do so just the same. They must have free choice or will later angrily reject the idea.

5. **Opportunity for language** – Give everyone in the audience a chance to be moved to language. This usually means at least some time for questions and answers. But if the audience is large, you may need to get them talking among themselves for five minutes or send them to dinner in groups. With young people, it can be as simple as the word “cool.”
6. **Short-term actions** – Make sure that there is some opportunity for short-term action, something they can do this week without actually committing to changing their lives. Reference lists to

take home and Web sites to surf are great here. It is not necessary that they be able to contact you personally, but a contact possibility with an appropriate organization or discussion group will be most helpful. If they have bought in, they need to have a clear next step to take.

7. **Long-term action** – Make doubly sure that there is an opportunity for long-term action available. They need to know how they can make a real contribution to the project. These are the actions that get the job done.
8. **Vision of Success in memory** – You should suggest that they recall their vision of success from time to time. This can take the form of describing your personal practices in this area.

Do not expect this process to be 100% successful. A 5% improvement over having no plan and just prattling on is great. The results compound like interest. The key to our success is to get each person to envision a positive personal vision of success to keep them in action.

The buy-in process is now well understood. We could hold our first buy-in meeting tomorrow. Technical people are such suckers for a good buy-in that it makes the entire transformation process possible.

3.6. Key Insights:

The transformation approach has a number of important insights that can be directly applied to our efforts.

3.6.1. It's all right

Whatever happens is all right. Whatever happened in the past cannot be changed, so the past is all right. We must not waste our time wishing we could change the past. The way things are right now is where we must be to be in action, so the present is all right. We must start our action from the truth we find on the ground. And, however much we accomplish tomorrow will be for the positive good, so the future is all right too. Don't sweat the small stuff; we will get there.

3.6.2. The process is 95% language

The faculties of the human mind that are used in transformation have evolved since we evolved language. This means that a great effort is needed to be precise in the language we use and great care taken that everybody is using the same meanings.

3.6.3. Fear does not generate transformation

Fear only generates action toward a quick fix. Most of our actions to date have been designed into scaring people into waking up. This approach will not work!

3.6.4. By invitation only

People can be forced into a transformation, for example at Boot Camp, but it requires powerful control of their entire environment. It will serve our purpose much better to honestly invite people to participate and then provide the leadership. Generating buy-in is a powerful form of leadership.

3.6.5. Logic Not Required

There is no requirement that a vision be logical for it to be used in a transformation or buy-in, quite the opposite. Was there a real need for the pyramids? What is important is that the idea be logically consistent and generate visions of success. Ideas that contradict themselves fare badly.

3.6.6. Filters and blinders, or the last renaissance man

The last time a human being was on top of every field of knowledge in Western culture was probably in the mid 1500's. Someone about that time was the last Renaissance man.

Since then, every human being has had to specialize. This means that we all are not looking at everything. We simply cannot be all things to all people all the time. We are all wearing blinders on our vision and filters on our hearing. In an organization or movement this can become "group think." As a result, we are all subject to completely missing important events (like 9/11) coming at us from our blindside, and we miss important positive breakthroughs for the same reason.

When we accept a new vision through transformation, we change the blinders we are wearing. This produces the great exhilaration of a new vision. The word "hip" refers specifically to this effect.

Having people on your team who are wearing different blinders is a very good way to watch your back. Diversity of thought is critical in difficult times, but not always valued on calm days. Who is watching your back?

3.6.7. Use your mavens

The words "geek" and "nerd" are extremely derogatory and should no more be used in polite company than the "N" word. There is a perfectly good English word that covers the exactly meaning we are looking for. It is "maven" and comes to us from ancient Hebrew by way of Yiddish. A maven is an extreme expert whom you need to consult from time to time. Unfortunately, ten minutes after starting a conversation with one, all you want to do is make a quick exit. The maven knows more than anyone ought to know about some narrow field of study.

Out-of-box thinkers can play a critical part in a major change, but only if the leadership is serious about things really changing. Mavens are hard to manage, but they are a powerful resource. How can they be used to further the transformation process? (These notes were clearly prepared by one.)

3.6.8. Stay out of fixing things

We have a tendency to get stuck in the mode of fixing things. This turns out to be an unproductive way to work, because you merely end up with a complex system with patches on top of patches. What we need is for our team to be in aggressively positive modes as much as possible; coming up with new ideas not just fixing things. We need to study what we do really well rather than what we have failed at.

3.6.9. Avoid big make wrongs

You do not want to get into a situation where half the workers are reacting to the other half as if everything they say is a major insult that was meant to make them wrong. This is a major pitfall and can be avoided only by due diligence.

3.6.10. Them versus us

Avoid dividing your people up into competing groups and setting them against each other, wind versus solar, for example. Human beings are strongly inclined to run competitions. This makes change a zero sum game. Transformation can only be played as a the-sky's-the-limit game where the sum is much greater than the parts.

3.6.11. You don't have to like it

You don't like it? That's all right. You do not have to like change; you only have to deal with it.

4. Transformation as a Engineering Discipline

Formal transformation and buy-in clearly can be used as engineering management tools.

4.1. Who built the pyramids?

The pyramids, and all the great monuments of antiquity, were not erected by slaves. They were built by dedicated teams of civil servants who had powerfully bought into the project. The vision for the project was provided by a major leader who could command the necessary resources.

4.2. Definition of engineering

We need to start from a standard definition of engineering. **Engineering is the application of mathematics and science to the solution of practical problems.**

4.2.1. Is engineering management engineering?

Does engineering management meet the formal definition of engineering, or is it primarily management? Is it based on science or on philosophy?

4.2.2. Managing Innovative Engineering

If we do not take positive action to develop new processes for managing our technical projects, we will be stuck forever in 1965 and Sustain will surely fail.

Technical innovations can come from following new math and science down whatever path they suggest and hoping there will be something of value at the end. This approach is called Whiz Bang. It can be great fun, but it is an inefficient process that nevertheless can produce unforeseen breakthroughs, like the Internet. We need some of our people doing Whiz Bang.

Alternatively, we can start with a problem and apply new science and math to find new solutions. This direct approach is more efficient and focused, but less serendipitous. This approach is often applied to merely fixing things, but at other times it opens up the possibility of a new vision on known problems. In this paper, I am proposing to use the second approach, with the problem of generating Sustain.

4.2.3. “Not Invented Here” versus “Only worth what you paid for it”

On the one hand, we tend not to want to use processes we did not invent by our group. We reject things that are not invented here. On the other hand, if we do not pay a contractor good money for the process, what value could it have? What I am proposing is to invent a transformation for Sustain within our own group. This will be a great challenge for technical people, but should generate a great deal of invented-here buy-in.

4.3. Why find a new base for Transformation?

Technical people do not generally like philosophical approaches and they have strong blinders against any management technique so based. They disdain them as today’s management buzz word. I think the Sustain team is unlikely to accept a transformation process based solely on philosophy, but might better accept one based on science.

It is not at first obvious that new science can serve as a basis for engineering management. Knowledge of the old philosophic base is a big help in identifying the critical breakthroughs. We can start by replacing the old procedures one step at a time.

5. Introduction to Evolutionary Psychology

The 1990’s were the decade of the brain. Our understanding of the workings of the human brain advanced with one breakthrough after another. The new information was then organized into a field called Evolutionary Psychology.¹¹

5.1. Modeling the brain

One key idea of evolutionary psychology is that the human brain can be modeled as a network of modules. Each module achieved its function through Darwinian evolution in a time long before the advent of civilization. In the nature vs. nurture debate, evolutionary psychology answers powerfully, “all of the above!”

The specific pieces of brain tissue that function as modules can now often be identified using functional Magnetic Resonate Imaging (fMRI). There is nothing technical people like better than a big instrument spewing out mountains of science data that can be visually represented.

Evolutionary psychology has many sub-disciplines. These include specific application of the fields of normal psychology, evolutionary theory, cognitive information technology, archeology, sociology, anthropology, and the physiology of the brain. We need only concern ourselves with a select few.

Technical people are most familiar with evolutionary cognitive psychology concepts.¹² These cover the theoretical relationship between the human brain and computers, along with the computational

aspects of evolution theory. This is a predominately mathematics branch with many computer applications, such as neural networks and robotics.

The brain module studies have, so far, only been of general interest because there was no obvious way they were tied to our problem solving. We do sometimes take notice of the identification of modules like eureka¹³, which we know instinctively and use habitually. How many times have you solved a puzzle and experienced a quick, definable high? That was the Eureka module going off.

The brain modules became more interesting when they started to match specific sections of the philosophical basis of our actual practices, such as buy-in. These could actually be of practical use in our work. That they match makes good sense because the two fields are detailed studies of the same phenomena.

5.1.1. Old “Blank Slate” completely out of date

Evolutionary psychology has now advanced to the point that it has rendered its predecessor obsolete.¹⁶ That predecessor was behavior modification, which modeled the human brain as a blank slate that the environment wrote upon. It assumed that the nature vs. nurture balance was powerfully on the nurture side and was taught widely during the time that most of our technical people were in school.

Behavior modification was also used in certain management schools in the form of the carrots-and-sticks approach. If people do what you want, reward them with something good, a carrot. If not, hit them with something. This approach reliably produced small positive results, but never lived up to its own hype. It is now decades out of date, but refuses to die.

Trying to scar people into a sustainable lifestyle is a behavior modification approach. We must stop using it. Using behavior modification on a highly educated group of people is teaching pigs to sing. It does no good and it makes the pigs very angry.

5.2. Modular brain theory

The human brain may be modeled as a network of modules. Each module evolved for a specific purpose and the modules are organized into networks of increasing size. Many modules are used by multiple networks. Some capabilities of the human brain, like awareness, appear to emerge from the highest level of the network and are not dependent on any one module or sub network. This network organization allows us to apply new mathematical concepts from complexity and network theory.

A significant number of modules have now been associated with specific brain tissue using an fMRI.^{15, 17} This match-up has become a great science game over the last few years. In these images the modules look like crumpled postage stamps caught in a week-old spider web.

The latest modules evolved back when we were roaming the savannas of Africa. We have not lived under civilization long enough to evolve new ones.

5.2.1. Typical module: the face recognition group

The primary means of recognizing individuals in humans and chimpanzees is the face. For comparison, dogs use scent and whales use ultra-sound. You have three small modules in your head

that deal exclusively with faces. The first is in the vision center at the back of the head and recognizes a face. The second is in an emotional center and adds an emotional tag, particularly to relatives. The third is in the language center and adds the name. There are probably others in this small network that add hierarchical information and gauge sexual attractiveness.

These modules are scattered and are therefore subject to isolated damage of a single member of the network. There are people who can identify every part of the face (nose, mouth, etc.) but do not understand what a face is. There are people who can recognize and name a person by their face but do not have the expected emotional attraction. The latter conclude that the identified person has been replaced by a pod person.

5.2.2. Key module example: the mirror neurons

One important set of two good sized modules with known positions are the Mirror Neurons.¹³ The first three steps of our buy-in process are intended specifically to match the needs of these modules.

Think about a time when you got personal instruction to do something with your hands. A woodworking show is a good example. If you were interested and followed closely, you were probably in a mental state where you were mentally practicing every move, even to the point of almost moving your arms. The mirror neurons generate this effect. They organize the practice of all the brain activity needed to do a task while you are only watching the task, but they disconnect the muscle drivers for this practice period. When you subsequently try the activity yourself, your brain is already well practiced.

5.2.3. Other key modules

There are a number of well-identified modules that we will need to deal with to achieve our task. These include:

5.2.3.1. Eureka¹¹

This is the one that gives you the little high when you solve a problem. Technical people just love it. It provides a series of sustaining rewards for doing complex mental effort. Its brain position is now known.

5.2.3.2. Being tricked

If you are fooled, or conned, or robbed, you probably recognize the problem suddenly and react with strong emotions. We must work very hard to avoid even the impression that we are tricking anyone. Our current scare tactics appear to trip this module.

5.2.3.3. The meaning of hydrogen

The periodic table gives a number of important parameters about each of the elements, but it does not give their meaning. If you think about it for a minute, it is very easy to propose meanings for each of the elements: for example, hydrogen means lightness and simplicity. Why don't we devise a test for meaning and add this parameter to the periodic table?

The answer is simple, but the ramifications of that answer are immense. All meanings are produced by a specific module in the language center of human brains, and no where else! We can come up with a meaning for anything in a second and keep doing it all day long.

Most of our problems with managing change can be traced to people making up a meaning for something and insisting that that meaning is the real meaning. Most of these meanings serve neither the person nor the process well. Most such meanings are action killers.

The key insight here is that when you find yourself stuck with a meaning that is holding you back, simply drop it and make up a new meaning. If you are making change mean “the movement is doomed,” then try “these changes will give rebirth to the movement.” You made up the first meaning. You can make up the second just as easily. You have brain tissue dedicated to this specific task.

6. Direct Application to Sustain

We could use any or all of the following ideas from transformation theory to initiate Sustain and build continuing support.

6.1. Transformation is a language process

The only path in the human brain that supports transformation goes through the language section of the brain. We must get each person to envision themselves succeeding with the idea and to do that their vision system must not be in use at that moment. They cannot watch your visuals and envision themselves succeeding at the same time. You can provide information in any visual format, but at the critical moment you must stop the visuals and use only language. This makes language the key to the whole process.

6.2. Building a vision of success for every individual person

Generating buy-in is not cheerleading. We are not trying to produce general excitement about the project. We specifically need to get each person to envision themselves succeeding with the project. We now have a detailed model for the buy-in process and can therefore proceed more effectively.

Currently, technical people show high levels of resignation and cynicism about effective change. This often leads to them working only on the whiz-bang approach and refusing to take a stand on key issues. These are simple states of being that can be successfully addressed by generating buy-in.

6.3. Bureaucratic inertia

To make Sustain work we will have to change many enormous bureaucracies both public and corporate. For most technical people, bureaucracy means “just something we have to live with.” This leads us to be resigned about it ever changing. In truth, bureaucracy is the most productive way that the human race has ever invented for doing major projects. It has a history of at least 15 thousand years. It is as old as civilization itself and probably nearly as old as language.

Bureaucracy is powerfully supported by specific brain modules for language, hierarchies, and status identification. It is in our heads. Several of these key modules have even been identified in monkeys and chimps, others even in birds. Some are very old indeed.

We need a powerful definition for bureaucracy detailing what can and cannot be done. If we do not develop one, bureaucracy will mean for most members of the team either that nothing can be done, or that catastrophe and change are the same thing.

Bureaucracies make their own rules to do things very efficiently. One large class of rules keeps the bureaucracy in existence. After about ten years of life, any bureaucracy that doesn't have this powerful set of rules simply expires.

Transformational change in a bureaucracy does not require that everything change, but it does require that a good proportion of the rules that keep the bureaucracy in existence be discarded. Change can then occur, and a new set of locking rules will develop. In aerospace terms this can be seen as an orbital change maneuver in which you must first undock, expend a great deal of energy to create a delta-V, and then redock in a different orbit. Out-of-box ideas, like the ones in these notes, are absolutely critical to the first step, unlocking from our present state.

One of our tasks, then, is to identify the rules that keep energy bureaucracies in existence and unlatch some of them. Many of them have to do with language. This is a very scary thing to do and will be widely resisted.

6.4. Nixon goes to China

People who don't like change, and that includes most technical people, have a problem. In stable times making many little improvements will keep you up with changes. Processes using the tried-and-true will work very well. In difficult, rapidly changing times this approach cannot keep up. When things look like they might get out of control, even the most reluctant of us are forced to try for a big breakthrough and then "Nixon goes to China."

President Nixon had impeccable credentials as an anticommunist. In his second term, communist China was a politically isolated nation with nuclear warheads and the missiles to deliver them. President Nixon decided the only way to handle the situation was to bring them into the community of nations and Nixon went to China. It turned out to be one of his greatest legacies.

Even though our old change management systems are based on philosophy which our technical people do not like, and the new system uses evolutionary theory that conservative people do not like, sooner or later, we all will be looking for breakthrough ideas. If by then we have this new science applied to transformation at a practical level, we will have a road map ready so that Nixon will at least be able to find China when he needs to.

7. Follow-on Action

The simplest model of the 21st century is simply the 20th century, complete with all its breakdowns and break thoughts. We can do better than do its breakdowns, including two world wars, a depression, and a long cold war. We can even generate more breakthroughs; we now have the engine of technology running in high gear.

There is much work to be done and we have no choice but to do the work. Much of it must be done by technical people. Where we need new tools; we will build new tools. We need to build a dynamic vision of a sustainable society; we will build that vision. To see the history scope of this effort, we need only note that one a small part is to rebuild the energy infrastructure for the entire world. Sounds like fun to me; it is certainly not going to be boring.

If our computer models have any value at all, within a few years the world will experience significant breakdowns that will change the way the majority of people see the future. They are likely to be very upset and will demand a new vision. We can have that new vision ready.

For the United States, the most likely cathartic breakdown will be the energy sector after Hubbert's Peak in global oil production. We will likely have 1970's style gas rationing with no means of ever going back to our old energy consuming habits. The associated balance of payment problem will force severe conservation measures. We can have a new vision ready for renewable energy.

For the world, the most likely cathartic breakdown is around global warming. One bad summer will make it very clear to the majority of the world's people that the Earth's climate has changed. We can have a new vision ready for this too.

We can build a vision of a sustainable society and a sustainable world. We can use that vision to be in personal action. We can use that vision to generate buy-in for the necessary technical projects. We can do.

We can make our visions dynamic so that they adapt to both to new data and understanding and to the very changes we are creating. We are up to this challenge.

7.1. Personal actions

I will support this movement with a number of personal actions:

1. Coaching – I am looking at coaching technical transformation to generate retirement income.
2. Writing – I will continue writing.
3. Speaking – I am a trained and energetic public speaker.
4. Web Master – I will support my personal actions from a Web site.

Thank you for considering my ideas.

8. References:

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These books define our problem. It is time to get into action.

5. Steven W. Popper, Robert J. Lempert and Steven C. Bankes, "Shaping the Future", *Scientific American*, April 2005, pp 66.
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These articles show our present state of knowledge in using computer models as tools to solve future problems. They show how to use such models as management tools for robust solutions.

7. Landmark Education Corporation, Internet: <http://www.landmarkeducation.com>
8. Rosamund Stone Zander, Benjamin Zander, *The Art of Possibility* (Penguin Books, 2004)
9. Sue Annis Hammond, *The Thin Book of Appreciative Inquiry* (Thin Book Publishing, 1996)

These references talk about taking on problems in an aggressively positive manner.

10. Tom Riley, *Look the Future Straight In the Eye* (Publish America, 2004)

The author's book that providing more details on buy-in and other positive approaches.

11. David M. Buss, *Evolutionary Psychology* (Pearson, 2004)
12. Eric B, Baum, *What is Thought?* (MIT Press, 2004)
13. Mark Jung-Beeman, et al, "Neural Activity When People Solved Verbal Problems with Insight," *BloS Biology* <http://biology.plosjournals.org>, April 2004, Volume 2, Issue 4, Page 0500
14. Steven Pinker, *The Blank Slate, The Modern Denial of Human Nature* (Viking, 2002)
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These are just a sample of thousands of books and articles on our new understanding of how the human brain works.