

WHOLE-SYSTEM ARCHITECTURE

INTRODUCTION

No theory or method of management has had the impact that the Toyota Production System, or lean management, has had over the past fifty years. Norman Bodek first brought its architects, Taiichi Ohno and Shigeo Shingo, to the United States and translated their books to English. It was then popularized by James Womack¹, Jeffery Liker² and others as lean management or lean culture. Lean management and culture has become today's standard of management for most organizations whether in manufacturing, healthcare or other sectors of the economy. Lean management has repeatedly proven its effectiveness to improve both efficiency and customer satisfaction. But the implementation of lean management has proven to be problematic for many companies. They get the idea of lean, but don't recognize the significance of the transformation required in both behavior and organization architecture, and they lack a clear method to create that transformation. This book presents a method for transforming the entire system of the organization, its architecture and culture.

When many companies begin their lean journey they may not realize that both Honda and Toyota started their operations in the United States and other countries outside of Japan with a green-field site where they designed the plant layout, organized the equipment, aligned their suppliers, hired all of the managers and associates and trained them in their way. They created a unified *whole-system* whose parts were all aligned to the same philosophy. They were not changing a culture, overcoming resistance, or redesigning existing facilities. However, this is entirely different than the challenge facing most companies. Toyota and Honda succeeded because they had a unified, whole-system, which they

¹ Womack, James P., Jones, Daniel T., Roos, Daniel. *The Machine that Changed the World*. New York, Free Press, 1990

² Liker, Jeffrey K. *The Toyota Way*. New York, McGraw Hill, 2004.

built over time and for which they had common understanding and commitment at every level of the organization. In that sense, they had it easy.

Most companies implementing lean today are focused on tools and techniques. Too often they have disaggregated the whole-system and have focused on small pieces of it. They have implemented 5S, just-in-time, work teams or PDCA problem-solving groups. But the old culture is firmly embedded in the systems, structure and symbols that remain untouched and guarantee resistance to change. The most common cause of failure is the failure of the leadership to address the need to align the systems, structure and symbols to the desired culture.

About twenty years ago I was invited to the Merck Cherokee Pharmaceuticals plant in Danville, Pennsylvania to discuss the possibility of assisting them to create a team-based culture. I remember that first meeting very well because I drove through a blinding snow storm to get there. The meeting at the Pine Barn Inn was attended by all the senior managers of the plant as well as the union president and his senior officers. They agreed to begin a process of co-creating their future organization. The senior team, with the union, who together formed a steering team, wrote a design charter specifying the goals and boundaries. Design teams were formed and they analyzed the work flow and the social system. They then designed the teams around the work flow. But the design didn't end there. It included a competency model for team members and qualification for "star points," skills for which team members would be paid. It redefined management jobs and titles. It also included a plant wide bonus plan by which all salaried and hourly employees shared an annual bonus based on the same metrics which they tracked throughout the year. The design included training for teams at every level, including the senior management team. It included sharing of all significant information on plant performance.

A couple years ago I was asked to return to Danville and assess the state of the process and help refresh the teams, particularly for managers who were new to the plant. The team process and culture had been sustained for eighteen years, and through five changes in plant manager. The union president, Ed Vallo, enjoyed pointing out that he had to "educate" each new plant manager on the process.

The point of this story is that significant culture change can be achieved and sustained. Would this same change have been sustained over twenty years if it were merely the idea and initiative of management? Probably not. Would it have been sustained if the design had been presented by consultants and then sold to the employees, rather than facilitated and created by them? I suspect not. Would it have been sustained if it was only the formation of teams and systems of training, information and motivation were left unchanged? I doubt it. The managers and employees of the Cherokee Plant had co-created and shared ownership of the process. Together they modified the design as they experimented and learned. Most important, they understood and addressed the whole-system of the organization. They agreed on cultural values and they built the organizational system around those values. That is the process presented in this book.³

The human body is a *whole-system* comprised of separate organs or sub-systems and they fit together as a brilliantly unified architecture. The heart relies on the lungs for oxygen and they both rely on the digestive system for nourishment. And, they all rely on the nervous system for information and instructions. If you remove any of these sub-systems from the whole, it will quickly die. If one organ of the body becomes damaged or sick it will quickly impact the functioning of other organs. Our national culture operates by similarly laws. We have principles stated in a Constitution and we have laws defining the functioning of institutions. Our education system, financial system and infrastructure are all sub-systems, organs, of the body of the national culture.

In the same way, pieces of lean management most often die like fish out of water because they depend on the other organs for their survival. You cannot implement a lean management structure, with strong teams at every level, without changing the decision process, the information flow, and the reward systems. You cannot implement just-in-time work flow without changing the information flow, the decision-making process and without redefining jobs at the first level. And, you cannot implement lean culture without changing the functions and structure of management. These are all organs of the same body.

³ A number of excellent managers nurtured and helped the system evolve over the years, particularly Mike Rocci, George Santos and Justin Noll, as well as a competent team of internal consultants, including Christine Moyer.

Organizations, whether public or private, are living and changing bodies. Most will fail, sooner or later. The cause of failure is rarely the external threat, the attack of the barbarian or the fierce economic competitor. The cause is most often an act of suicide, self-inflicted by one's own hand. Civilizations most often decline when there is an internal loss of unity, of common vision and a faith in the future – companies do the same. *Whole-system architecture* is designed to create unity of purpose, values and alignment of systems and structure to strategy.

DISRUPTIVE ENVIRONMENTS REQUIRE TRANSFORMATIONAL CHANGE

Sustainable organizations adapt to their environment and when that environment changes, they too must change.

Bureaucratic organizations can only survive in a world in which the external environment is slow to change. Fifty years ago that was possible. It is no longer. Most industries are affected by disruptive technologies or markets. Many of those technologies are clustered around the Internet and related marketing channels. But there are also disruptive technologies that impact how things are made and designed. Print-on-demand technology, for example, has enabled ordering a book on Amazon one day; the very book you ordered being printed that night; and shipped out the next day, to arrive at your door the following day. That has enabled a revolution in marketing channels, not to mention the impact of e-readers. Borders, Brentanos and other book chains have disappeared and the only remain chain of bookstores, Barnes & Noble, at the time of this writing appears headed toward a sad end. In almost every industry companies are confronted by disruptive technologies. Those disruptions require dramatic changes in internal processes and organization. Most lean efforts fail to meet that requirement. What is required is transformative and holistic change. The whole-system architecture methodology presented in this book is exactly that.

LIFE-CYCLES, BUREAUCRACY, AND TRANSFORMATION

All living things go through transformations from one stage of life to the next. Organizations, like people, are not robotic or predetermined in their transitions. However, just as one can predict behavioral tendencies of a two year-old or thirteen year-old, one can also predict that an organization will go through life-cycle stages. Each stage requires transformations in the design of the organization's systems and structure,

just as different human life stages require different structures to our own lives.

As the American automobile industry aged and grew too comfortable in the middle of the last century it developed increasingly complex structure, with increasing levels of management and increasing divisions across functions. The silos and rigidity of the walls between silos, like the hardening of the human arteries, is a natural result of aging. In *The Machine that Changed the World*⁴ the authors tell the story of a door lock engineers worked designing door locks for twenty-seven years. At the same time, across town, in the manufacturing engineering department there was an engineer who worked on door lock manufacturing process for twenty years. How often did they meet? Never! That is an astounding feat of organization design!

In the same book the authors describe the process by which General Motors and Honda designed similar cars, the GM10 platform and the Honda Accord. In both cases “*A number of functional departments – marketing, power train engineering, body engineering, chassis engineering, process engineering, and factory operations – must collaborate intensively over an extended period of time to develop the new car successfully.*”⁵ But how this was accomplished at GM and Honda were entirely different. In both cases a cross functional team was assembled comprised of individuals from each of the functional organizations. But there the similarity ended. In the GM case each employee was concerned with his career ladder in his functional organization. The team leader had the power of persuasion, but not the authority and decision making power to bring the work of the functional groups in line with the needs of the design of the new car. After many delays the team leader quit in frustration. It took two more team leaders and several years to bring the car to market. During that time Honda had produced two generations of Accords and both sold well. The sales of the GM 10 were disappointing.

At Honda the team leader of the Accord design team reported directly to the CEO. It was clear to all that there was no more important executive and no more important group in the company than the team designing the new Accord. This team leader had the power of authority, to make decisions, and it was the job of the functional organizations to meet the needs of this team. At GM the team leader was a coordinator. At Honda the team leader had decision making authority and control. The roles and the

⁴ Womack, James; Jones, Daniel T; and Roos, Daniel. *The Machine that Changed the World*. Free Press, New York, 1990.

⁵ Ibid. p. 106.

understanding of the teams were entirely different. One represented the classic problems of bureaucracy and the other the understanding of lean.

In an independent study Professor Kim Clark at Harvard did a comparative analysis of Japanese, European and American auto product development.⁶ He found that a totally new Japanese car required 1.7 million hours of engineering and forty-six months on average. In contrast, U.S. and European companies required 3 million hours and sixty months.

The differences cannot simply be explained by pointing to a PDCA or continuous improvement cycle. Nor can it be loosely attributed to culture. It is more than that. It is the design of the process, the organization around the process, and the decision making authority and process. In other words, it is the real stuff of organizations and that must be deliberately designed! And that is particularly true if your company has developed the normal rigidity of bureaucracy.

FROM BIRTH TO DEATH AND REVOLUTION

It is obvious that an early entrepreneurial company has a very fluid and flexible organization, if it has any organization at all. With growth comes the requirement of specialization both in core functions such as research and engineering, manufacturing and marketing; and, with that specialization comes increasing administrative processes, accounting and recording, human resource and information systems, with increasing definition and complexity. And, with the growth of those administrative systems comes the risk and burden of bureaucracy.⁷

Thomas Jefferson said that *"I hold that a little rebellion, now and then, is a good thing, and as necessary in the political world as storms in the physical."* What did he mean by this? He meant that from time to time we need to rethink how we do things; rethink our system and organization and question whether it meets the needs of the time in which we live. This is as true for every company as it is true for a nation. The development of rigid bureaucracy is a natural result of aging, whether in government or business.

Most entrepreneurial companies are born with the inspiration of an idea and faith in that idea. And, that idea is generally a response to a

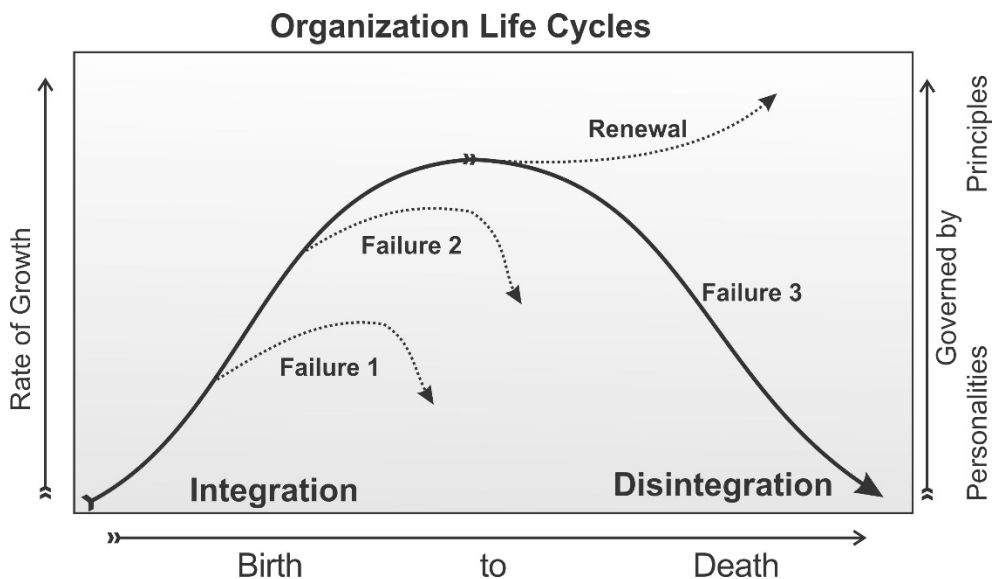
⁶ Kim B. Clark, W. Bruce Chew and Takahiro Fujimoto, "Product Development in the World Auto Industry," Brookings Papers on Economic Activity, No.3, 1987.

⁷ I have described the process of rise and fall, integration and disintegration in more detail in *Barbarians to Bureaucrats – Corporate Life Cycle Strategies*. New York, Fawcett Columbine. 1990.

challenge, large or small. That person, like the founders of civilizations, are most often better at spreading “the Word” than they are at organizing people and processes. The entrepreneurial stage is when the organization is creatively responding to the challenges from its environment. The process of growth in companies, like in civilizations, is one of creative response, followed by a success, and then a higher level challenge requiring a higher level response.⁸ Neither companies nor civilizations emerge in the absence of challenge and the failure to recognize a challenge may be the cause of collapse. As Arnold Toynbee said, *“We have rejected the view that civilizations are apt to be generated in environments – physical or human – which offer unusually easy conditions of life to Man.” “We have now perhaps established decisively the truth that ease is inimical to civilization. The results of our investigation warrant the proposition that, the greater the ease of the environment, the weaker the stimulus towards civilization which that environment administers to Man.”*⁹

It is this mechanism of challenge-response that leads to success stages of growth in organizations and each stage requires some degree of redesign of the organization’s architecture.

As organizations grow, the dominance of the personality who founded the organization must give way to the dominance of principles and process. All great companies and countries are dominated by principle rather than personality. It is an immature country or company in which



⁸ Toynbee, Arnold. *A Study of History*. Cambridge University Press, London. 1934.

⁹ Ibid, Volume 2, page 31.

the personality of leaders is more important than the principles and processes that govern the behavior of its members.

The first point of failure is the failure of this transition – establishing principles that will outlive the personality and form firmer ground upon which the structure of specialized functions and defined processes can be built.

The second most common failure point is when those systems of specialization, both in core and enabling processes, become dominant in the life of the organization and its members owe their loyalty to the marketing or manufacturing organization and not to the whole. This is when the organization becomes focused on making legs, rather than making chairs and the processes of disintegration sets in prematurely.

Assuming the leadership of the organization achieves integration of these specialized functions, the organization will progress toward maturity. But, maturity has its own risks. With maturity comes security, wealth, and what Arnold Toynbee called “*a condition of ease*” or the failure of the mechanism of “*challenge and creative response*”¹⁰ and it is then that the leaders fail to recognize new challenges on the landscape and lose their creativity, relying on yesterday’s successful response but now in the presence of new challenges, and mechanically pull the same lever faster and harder but with decreasing effect. It is the failure of creativity, the worship of heroes of the past rather than the present that signals the death of a culture and the beginning of disintegration. It is this loss of creativity and will, the internal act of suicide, which is the most frequent cause of disintegration and death.

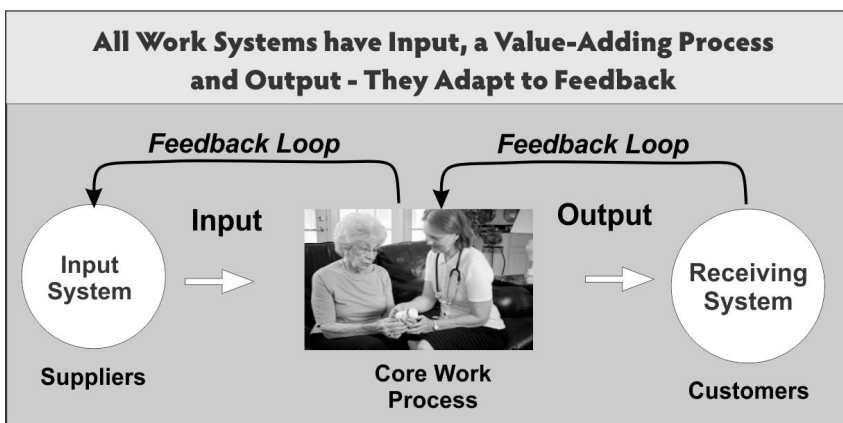
Unlike in human life, death of organizations is not inevitable, only likely. There is free will. The natural process of aging in organizations can only be averted by the willingness to conduct your own internal revolution from time to time. Whole-system architecture is about conducting your own controlled internal revolution. It is about instituting a creative response to the challenges of this day.

ORGANIZATIONS AS SYSTEMS

All systems must become aligned to their environment if they are to survive. Adaptation is critical for survival of every species. With the increasing speed of change in both technology and social behavior, organizations must increase their speed of adaptation.

¹⁰ Ibid. Vol. 2, page 271.

Every system whether an ocean or forest, a school, hospital or business, all have the same elements: First, there is input into the system from a supplier or input system; then there are processes that transform input to output. That transformation, in the case of a business, must add economic value to the customer who is the receiving system. Every business must create more value than the cost of the work system, otherwise it is not sustainable. And, every system adjusts to its environment by processing feedback. The design of organizational systems must incorporate an understanding of the landscape, the external environment, and how that environment is changing.



SOCIO-TECHNICAL SYSTEMS

When I first read an article on socio-technical systems (STS) it was one of those “ah-ha” moments when something becomes obvious and useful. The theory of STS is simple and elegant. In every organization there are work or technical systems (the work process or “value-stream”) and there are social systems, the “people” systems or culture that surrounds the work process. In most organizations these have been designed independently and are misaligned, producing sub-optimal performance. Socio-technical system¹¹ design, or what I chose to call *whole-system architecture*, is a change methodology as well as a way of looking at the nature of the organization. STS or whole-system design is based on a process of co-creation, in which the stakeholders in the process together

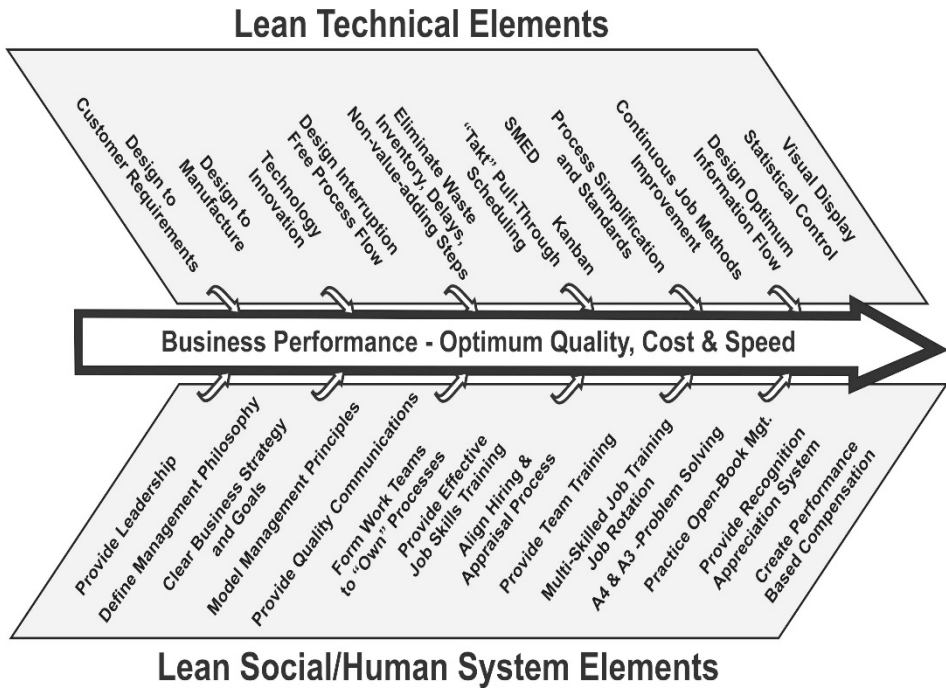
¹¹ Pasmore, William A. *Designing Effective Organizations: The Sociotechnical Systems Perspective*. New York; John Wiley & Sons, 1988.

analyze the current state and design a future ideal state.¹² The theory is that by having managers and employees who work in the system, customers, suppliers and anyone else who *knows, cares* or must *act* on the system engaged together, not only will the future design be more effective for all, it will also gain their ownership and commitment which will lead to successful implementation. This is the principle of co-creation and it is a key element in successful change management.

About a month after I read the Lou Davis article¹³ I was presenting a consulting proposal to Moody's Investor Services in New York and I couldn't help myself. I proposed that we do an STS intervention to redesign their work system. They bought it and miraculously it worked. After that my consultants and I did more than one hundred STS or whole-system architecture projects over a thirty year period. When I became involved at Honda it was very obvious that their system was a dramatically different technical and social system than those I was used to. They did not use that language, but they didn't use "lean" language either. I simply incorporated the lessons from Honda (see Appendix: The Honda Way) into our whole-system architecture projects as a model of what an alternative system might look like.

¹² Cherns, A. (1976). The principles of sociotechnical design. *Human Relations*, 29(8), 783-792.

¹³ Davis, L.E. Evolving Alternative Organization Designs: Their Sociotechnical Bases, *Human Relations*, 39 (3), 261-273.



Most things that are useful are essentially simple. Socio-technical systems are simple. The tractor, car, airplane, telephone, the cell phone, the Internet, are all technical things that have altered the prevailing technical work systems. And, they all have dramatically altered social relationships. They have altered how children learn their ABC's, how we communicate with family, how we find dates and life partners, and how we buy or sell houses and cars. People change with technology and technology changes to meet the needs of people – it is all one big socio-technical-economic system. And, every factory, office, or hospital is a socio-technical-economic system. It's that simple. But, within our organizations changes often result in misaligned social and technical systems.

In writing this book I am drawing on two primary strains of knowledge. The first is previous systems thinking. The second is lean management and the study of the Toyota Production System (TPS). Proponents of TPS/lean are too often focused on tools and too infrequently focused on the system. My purpose is to bring the best of these knowledge streams together to help you redesign your whole-system to lean standards.

Let me be clear about the theory and method presented in this book. Every book on management, although the author attempts to present new ideas, is built on a stream of learning and the work of previous thinkers. This book incorporates, and is built on the previous methods and concepts from all of the following change management methods:

- Socio-technical system design.¹⁴
- Systems-thinking.¹⁵
- Idealized design.¹⁶
- Interactive planning¹⁷
- Re-engineering¹⁸
- Appreciative inquiry¹⁹
- High-performance organization design²⁰
- Behavior Management or Behavior Analysis^{21 22}

All of the above theories and change management models have the following in common: First, they all seek to achieve significant, transformational change in the culture and capability of an organization. Second, they all view the organization as a dynamic open-system interacting with its environment and engaged in adaptation to that environment. Third, they all view the organization not only as a mechanical system, but as a human or social system, that performs best when the psychology of humans is taken into account in the design of the system.

¹⁴ Trist, E. (1981). The Evolution of Socio-Technical Systems. In A. a. Van de Ven, *Perspectives on Organizational Design and Behavior*. New York: Wiley Interscience.

¹⁵ Senge, Peter M. *The Fifth Discipline*., New York: Doubleday, 1990.

¹⁶ Ackoff, R. L., Magidson, J., & Addison, H. J. *Idealized Design*. Upper Saddle River, NJ: Prentice Hall. 2006.

¹⁷ Ackoff, Russell L. *Re-Creating the Corporation: A Design of Organizations for the 21st century*. New York:Oxford University Press, 1999.

¹⁸ Hammer, M. and Champy, J. A.: *Reengineering the Corporation: A Manifesto for Business Revolution*, New York: Harper Business Books, 1993.

¹⁹ Cooperrider, David L. *Appreciative Inquiry: Rethinking Human Organization Toward a Positive Theory of Change*. Champaign, IL: Stipes Publishing, 2000.

²⁰ Lytle, William O. *Designing a High-Performance Organization*. Clark, NJ: Block, Petrella, Weisbord, 1998.

²¹ Miller, Lawrence M. *Behavior Management: The New Science of Managing People at Work*. New York: John Wiley Interscience, 1978.

²² Daniels, Aubrey & Daniels, James E. *Performance Management: Changing Behavior that Drives Organizational Effectiveness*. Atlanta: Performance Management Publications, 2004.

What I am attempting in this book is to incorporate the lessons of all of these theories into a methodology I call Whole-System Architecture (WSA) focused on creating the lean organization and system.

THE FIRST PRINCIPLE OF CHANGE MANAGEMENT

Whole-system architecture is a change management methodology that recognizes the organization as a living, organic whole that must change in a coordinated way; and to do so in a way that will maximize the commitment and ownership of those who live within the organization. The first principle of managing change is that *we are committed to that which we help to create*. Conversely, we will not be committed to something that is imposed on or sold to us, no matter how good the sales pitch.

There is what I call the Habitat for Humanity principle. Habitat for Humanity builds homes for the disadvantaged. They learned an important lesson about sustainability. They do not just build a home and give it to a family. It is a requirement that members of the family must participate in the building of the house. They hammer nails, carry wood and use the paint brush. By doing this they are far more likely to care for and maintain that home. Their participation makes the home and the community more sustainable. The exact same thing is true of change within organizations. Habitats mission statement says *"We view our work as successful when it transforms lives and promotes positive and lasting social, economic and spiritual change within a community; when it is based on mutual trust and fully shared accomplishment; and when it demonstrates responsible stewardship of all resources entrusted to us."*²³ This would be a good mission statement for almost any corporate change process. It must not only move equipment around and speed a production process. It must transform the lives of those within the organization. It must promote positive and lasting social, as well as economic change. And, those who live in the house, the organization, must participate in creating that design. Then you will have commitment.

Consultants may be useful to guide the process and to ask questions that can help your people think creatively. However, it must never be the consultant's design. He or she must never own it. It must be owned by those who will then implement it. It is their house and they will live in it.

Whole-system architecture presents a useful metaphor. When you walk into a great cathedral your head goes back and you look up into the

²³ See Habitat for Humanity web site.

heavens of stained glass and flying buttresses. You marvel at the construction. And your first impulse is to focus on the physical thing of the structure. But, the architect had an end in mind. The architect understood that the nature of physical space, the interior structure of the cathedral, has an effect on the human spirit, emotions, and possibly behavior. You feel that effect when you walk into the cathedral, regardless of your religious views. The structure of your organization also has an effect on your spirit, emotions and behavior. But in most cases the effect is unintentional and often stifling, rather than uplifting of the human spirit. Our organizations need more than engineering; they need architecture.

STS AND LEAN SYSTEMS - THE MISSING LINK

STS theory and methodology was the basis for all of the early self-directed team plants in the United States. The Gaines Topeka pet food plant was one of the first. Proctor and Gamble and Corning designed many of their plants using STS methods and the team process became the norm. For the most part these plants were successful; but, not in all cases. Similarly, many lean implementations fall far short of expectations or even completely fail. There is a common cause and it has to do with understanding the “whole-system.”

As my associates and I implemented projects we increasingly recognized the complexity of organizational systems. For example, we designed Shell Oil Company’s deep water operations in the Gulf of Mexico, Corning’s Fiber Optics manufacturing, several airline operations, and several banks. These were not simple operations. They were complex systems that included a great deal of information processing, relationships with contractors, high levels of uncertainty and risks. We realized that they were not only social and technical systems; they were economic or financial systems. That should be obvious, but it is not always taken into account in change management. It became apparent that the failure to take into account the flow of money into and out of the system may make the design of the social or technical system fail or not be sustainable.

One of the most well-known cases of STS was Volvo’s very progressive work system at their Uddevalla plant in western Sweden.²⁴ The plant was designed by joint union-management committees and they designed the system for small teams of eight workers to assemble an entire car. The moving assembly line that determined work speed in a traditional

²⁴ Sandberg, Ake, Editor. *Enriching Production –Perspectives on Volvo’s Uddevalla Plant as an Alternative to Lean Production*. Digital Edition. Avebury, Stockholm, 2007.

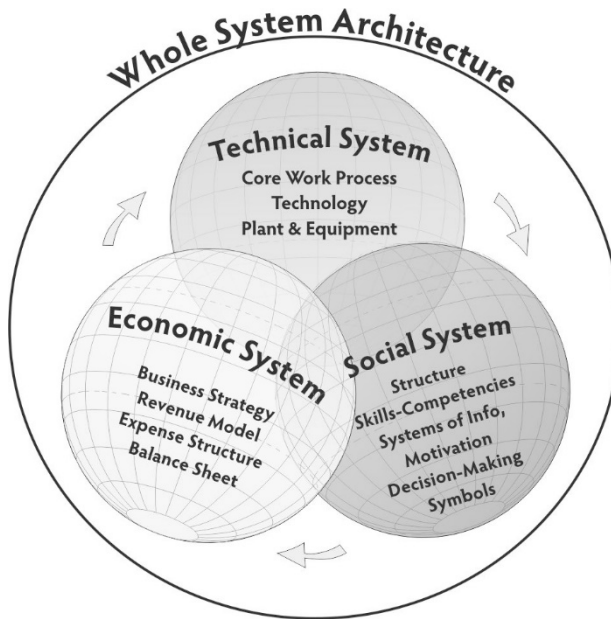
assembly plant was abandoned. In the Volvo system a work team controlled their own pace of work; they were all trained to do all jobs on the team and they could decide when to rotate jobs within the team. According to STS theory, this was ideal. They assembled four cars per day per work team. That amounted to a productivity rate of about twenty work hours per car. The problem was that Honda and Toyota were assembling cars in less than twelve work hours per car and every other auto company was rushing to adopt the lean model that enabled this rate of production. And, unfortunately, the Volvos being produced at that time were not of high quality. Their quality ratings were significantly below those of Honda or Toyota. After four years of operating this production system Volvo closed the plant in 1994. It is now a warehouse.

ENTER THE ECONOMIC SYSTEM

Does this mean that STS is a bogus theory, or that developing a work system that is humane and provides for an enriched work experience is a bad theory? Or, that the method of high participation design is not workable? Absolutely NOT! I have done this successfully many times. What it does mean is that if you focus only on the work system and social system it is possible to design a system that is not economically viable.

Every business enterprise is an economic system. Hospitals and non-profit organizations are also economic systems. Money comes into the system first as capital, and then revenues. Money goes out in the form of expenses and goods produced. The revenue must exceed the expenses and input value of the goods produced. In other words, the system must add value in economic terms. This is no news to anyone running a business. But it is news to some who implement both lean and STS systems. In both cases they can be designed without regard to the economics of that system.

In order to design the organization one must design and align the technical, social and economic systems together. If either of the three is not aligned with the others it is not a sustainable system.



The same model can be applied to any institution and even a country. The whole-system architecture process must begin with an analysis of the current state: work system (cycle time, eliminating waste, variances, etc.); an analysis of the culture or social system (the empowerment, decision-making, competencies, motivation, etc.); and an analysis of the money flow. Based on that analysis, design teams then design the future.

WHEN TO USE WHOLE-SYSTEM ARCHITECTURE:

We have been introduced to many problem-solving models as the solution to all ills. Whether it is Six-Sigma's DCMAIC, or the Shewart Cycle of PDCA or PDSA, or the A3 problem solving model, they are all predicated on the idea that there is a specific problem to be solved. Why do you think there are so many problems? Could it be that there is something more fundamentally wrong?

Maybe there is something wrong with the nature of the system. In healthcare we know that if the basic diet and patterns of exercise, the basic system of managing input into the body, is deficient, solving each illness is not the real solution. It is masking the problem.

Whole-system architecture is about pro-actively creating the future organization and system. It asks, “Given the future environment, the technology, the market and social changes, what do we need to be like in the future and how do we create that future?” It is designing a fundamentally different house than the one we are living in. Yes, there is a “problem” but you won’t find the problem by fixing every rash and headache. The problem is that the design of the organization and its capabilities is not suited to its current or future needs.

Paths to Lean Implementation	
Whole-System Architecture	Continuous Improvement
<ul style="list-style-type: none"> ✓ Focused on Strategy ✓ Rethinking the Whole-System ✓ Big System Change ✓ Questioning why we do everything ✓ Changes in both work systems and social systems ✓ Involves all stakeholders including the customer ✓ Design with the changing landscape in mind ✓ Rethinking Organization Structure 	<ul style="list-style-type: none"> ✓ Focused on Problem-Solving ✓ Change within a stable system ✓ Gradual & small improvements ✓ Questioning how we can best do something. ✓ Focused on a Work Process ✓ Done by those doing the work at every level ✓ Process owners experiment and improve ✓ How to improve work within the current structure

Whole-system architecture is a process designed to create significant change in the culture and work processes of an organization and produce significant improvement in performance. If your organization has a relatively traditional culture, you need WSA to engage your people, gain understanding and commitment to change. If you only need to make small improvements, to engage people in continuous improvement, you do not need WSA. If you need to align your organization and culture to your strategy, you need WSA. If the organization creates walls and barriers to the flow of work, you need WSA. If the market place is changing significantly and your organization needs to respond to changing technologies, customer demands, or regulation, you need WSA. And, if you

have had difficulty implementing change, gaining commitment from your own managers and employees, you need WSA.

WSA and CI are both good! The question is do you have a platform, the culture, structure, systems and processes upon which you can build the gradual continuous improvement process? If you do, proceed to that process.²⁵ If not, please keep reading.

LEAN ORGANIZATIONAL STRATEGY

The essence of strategy is recognizing the threats and opportunities presented by the external environment; and, then responding to those in a way that aligns the organizational systems to meet those challenges. In other words, if the future of marketing our products is going to be through the Internet and social media, with single day response and overnight delivery to customers, virtually every system in the organization needs to be aligned to achieve the success of that process. The old system will likely not have that capability. Continuous improvement will not get you there. Intentional redesign will.

Many lean initiatives begin with 5S and visual display in the production area. These have become common starting points because they are highly visual and we are motivated by visual stimuli. And, to be honest, they are relatively easy and place few demands on managers. We may be blind to even more significant forms of waste that are not so easily visualized. You may not see the waste in the process of designing a car, for example. You may not see the waste in failing to recognize new marketing channels or in the loss of creativity from a system that discourages creative thinking. And, you may not see the waste when your systems are not aligned internally. You might consider this the difference between strategic lean and operational lean.

There are two words that are keys to strategic thinking: these are *adaptation* and *alignment*. The failure of organizations to adapt to the dynamics of the external landscape and the failure to align internal systems and behavior both result in wasted energy. They both cause friction - friction between the organization and the environment; and, friction between members of the organization. Whether it is in a mechanical system or in a human system, friction is wasted energy.

²⁵ See *The Team Guide to Continuous Improvement*. Miller, Lawrence M. Miller Management Press, 2013.

ADAPTATION

All living things adapt or die. It matters little whether the living thing is a plant, a bug, or a company. As the environment changes they must change with it. Each living thing is a sub-system of a larger system and the larger system demands adaptation. Humans living in northern climates developed the engineering and construction skills they needed to survive in cold winters, while those close to the equator didn't waste their energy in that pursuit. As the environment changes, you will adapt or die. Too many companies are too slow to adapt.

Henry Ford's model of simplification of production started with the assumption that you could have the Model T *"in any color you want, as long as it is black."* That worked for a while. But then other companies offered cars at equal quality and cost in multiple colors. Ford's business declined until he adapted to the changing demands of the market place. Steve Jobs, in one of his numerous mistakes, believed that there was no reason for personal computers to display images in color or to have a hard drive. That worked for a while... and then he chose to adapt rather than die. The history of business is the history of companies adapting to changes in the external landscape or dying. As Dr. Deming said *"You don't have to change. Survival is not mandatory."*

The marketplace is a vast ecosystem, a jungle, if you like, in which new organisms (companies) are born every day and others die off. There are numerous reasons for the decline of companies but the most common is the failure to recognize the need for adaptation. The longer it takes for a company to adapt to external changes the more wasted energy and effort.

Too often, lean implementations are too slow to address significant issues of adaptation to customer preferences. Many lean consultants assume that using the PDCA cycle on the factory floor is the answer to becoming lean. But, often they are working on processes that should be eliminated entirely or need to be restructured, re-organized, or changed in large and rapid ways.

In the ideal system adaptation would be instantaneous. The moment a new healthcare technology or treatment was developed it would be instantaneously adopted by every healthcare provider. But, of course that doesn't happen. We suffer from the law of inertia (a property of matter by which it remains at rest or in uniform motion in the same straight line unless acted upon by some external force). The law of inertia applies to human behavior just as it does to physical objects. We tend to stay in our current place or state because it requires less energy than change. The

path of least resistance is the path that we are on, even if that path ignores external realities and leads to a cliff. However, the degree to which we are on a path that diverges from the needs of our customers, that degree represents wasted energy. Every measure of energy spent diverging from the demands external realities, whether technologies or customer preferences, is wasted energy.

The purpose of WSA is to provide a process of adaptation and alignment.

THE LAW OF ADAPTATION:

Organizations progress and are sustainable to the degree that they are capable of sensing shifts on the landscape and then developing those capabilities that will satisfy the market on the future landscape.

Corollaries to the Law of Adaptation:

- It is natural for organizations to remain on their current path and this inevitably leads to wasted energy and market dissatisfaction.
- The speed of changes on the landscape (technology, etc.) defines the necessary capacity to transform the internal capabilities of the organization.
- Transformation toward future capabilities requires transformational leadership, the impulse to foresee external changes and to drive internal adaptation by overcoming inertia.

ALIGNMENT

Principles or values have the power to create alignment and alignment creates unity of energy and effort and reduces friction in a system. The failure to seek alignment to principles is a failure of leadership.

Some years ago I was about to begin a project to design self-directed teams in a Corning Fiber Optics plant. As I toured the plant with the plant manager we were discussing the needs of the plant and the objectives of the design project we were about to initiate. I asked how the hourly employees were compensated. He immediately told me not to concern myself with that; he had another consultant who came in every year to

adjust the hourly compensation model. They were paid on a piece work incentive. I immediately stopped him and said “So, you want us to develop great self-motivated teams, but they are paid on individual piece-work incentives?” He said, “Yes, that’s right.” I immediately told him that was impossible. You can’t have one system of motivation pointing people in one direction, and a structure that asks people to behave in a different way. The systems and structure must be aligned. Along with the design of the team process we aligned the compensation system, information flow, job titles and every other element that would reinforce its success. The process proved to be sustainable over many years. It was sustainable because we reduced friction by aligning systems and structure.

I am confident in stating that the majority of lean implementations are crippled by the misalignment of systems, structure, symbols and skills. Lean management is a “whole-system” and each sub-system (HR, IT, etc.) must be aligned to reinforce the same behavior.

Alignment does not happen by accident. When Honda came to the United States they carefully designed all their internal systems to be aligned to the same principles. For example, one of their principles was the Unity Principle. It is not an accident that everyone wears the same uniform, indistinguishable by rank or work assignment. It is not an accident that everyone is referred to as an *Associate*. And, it is not an accident that there are no private offices. These were all intentionally designed as components of the social system of the organization to create alignment with their principles.

Friction is the result of misalignment. If you are told that the front-line team is to be an empowered, self-directed team, but the job definition and title of the supervisor hasn’t changed, you have created a state of misalignment. If are asking management teams to take responsibility for business performance, but those management teams do not receive the financial and other reporting that would engage them in the business game, you have created misalignment. If the process of hiring and on-boarding are not aligned with the principle of respect for people you are most likely creating misalignment and friction.

THE LAW OF ALIGNMENT

The degree to which all of the systems, structure, skills, style and symbols of the organization are aligned to the same principles and purpose, they are aligned with each other, and friction is minimized and sustainability is enhanced. The degree to which there is

misalignment there is wasted energy and the organization is less sustainable.

Corollaries to the Law of Alignment:

- Different functions operating within their own structure tend to create processes and systems that are misaligned from those created by other functions and operations.
- Those working within a function or operation will tend to believe that other functions and operations should be aligned to their function or operation and not the reverse.
- Therefore, alignment is only created as an act of intentional leadership and system design.

These principles and laws are neither complicated; nor are they obvious to those working within organizations. Yet, a large percent of time, particularly management time, is wasted energy, a direct result of both the failure of adaptation to the external realities and the failure of internal alignment. Whole-system architecture is intended to eliminate the waste of misalignment.

