

A Guide to Implementing the Theory of Constraints (TOC)

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Draft Copy

This page is “in draft” and on the internet so that I can more easily share it with a limited number of particular people. By all means feel free to read it, but be aware that I will continue to work on it, off and on, until I am happy and this draft notice disappears. Therefore at the moment there may be loose ends and disjoints that still need to be addressed.

The Misunderstanding Of The Intent Of W. Edwards Deming

So many times I have sat down and tried to encapsulate the propagation of the misunderstanding of the work of W. Edwards Deming – and failed. And so this page sat, and sat, and sat. Mid 2010 a colleague gave me some of Elliot Jaques working papers to hold for safe keeping. I had previously read his Basic Requirements for Effective Hospital Organization (Jaques 1995) and filed these new additions away in their envelope unread for some time. I guess that I knew that both Deming and Jaques had been at George Washington University and Jaques acknowledges Deming when addressing the concepts of QQT/R; the quality, quantity, and timeliness of an output for a given resource (Jaques and Clement 1991, pp 157, 181), but I was unprepared for Jaques detailed assessment that comes from his working paper on The Control of Process Variance (Jaques 1991). He understood Deming’s intent perfectly.

With respect to quality and continual improvement in North America (and let’s extend that to almost all who aspire to Anglo-American economic models) Jaques asserts that;

“... Deming’s work has in many ways been seriously distorted and at best only partially implemented ...”

Jaques gives 3 reason for this;

1. Quality/continual improvement is “separated out from and standing alongside the accountable managerial hierarchy.” Whereas in such functionality is within and part of the basic accountable managerial hierarchy.
2. Managers believe that output bonus incentives are essential for motivating people, this de-emphasizes continuous attention to quality standards and encourages everyone to push to get the “easy” job.

and perhaps most importantly

3. “Quality had become a special thing in itself, ripped out of its place as an ordinary everyday part of the work to be done.”

Now, I can't do better than that, and maybe by appealing to a higher authority such as Jaques, I hope to have proved my point. I used to find it odd that someone such as Jaques could almost totally ignore Deming, and yet clearly this was not the case, and whether using Deming in support of his own design or not, Jaques went right to the heart of the matter, demonstrating to me a consistency in understanding – be that requisite or systemic – between the two.

But this is only a skeletal assertion; that Deming's work has been seriously distorted and only partially implemented, we still need to flesh it out, to provide the broader context, so let's do that.

Deming Was A Farm Boy!

Deming was 92 when he published the first edition of The New Economics. Ninety-two year olds have seen a bit, which always made me curious as to why he included a long quote from A. Richard Seebass, the Dean of Engineering University of Colorado, on agricultural research.

“Agricultural research in the United States began with the Hatch Act in 1887, following England's success at Rothamsted. Experimental stations and agricultural extension agents in the United States began their work. They carried on research and make recommendations on what variety to plant, and when, how deep, spacing of rows, fertilization, effect of rainfall, irrigation when and how.

They carry out research on fruit, and on production of milk, meat, wool. Recommendations and technology are transferred by county agricultural agents to farmers. Farmers have always been quick to learn and to change. They have adopted without hesitation any labor saving device or machinery. They have always practiced cooperation.

Knowledge about agricultural practices has spread to developing countries. Yield has improved year by year in some of these countries, diminishing the demand for food from North America. [knowledge crosses borders without a visa.]

No such parallel exists between agriculture and industry. No spread of knowledge from America to Japan took place when Dr. Deming went there in 1950 at their request to help Japanese with quality. What he taught in Japan did not exist in America. He did not export to Japan American methods. He taught there the principle of a system. Japanese management and engineers listened and learned, put into practice what he taught. He relied on cooperation between people and between companies. Cooperation has always been in Japan a way of life.

The boundary of the system would be all Japan, Deming taught them. Companies must work together in cooperation. As you learn, teach others. The transformation in Japan must be a prairie fire covering the whole country (1).”

It wasn't an accident

Deming's early work was with the United States Department of Agriculture, but moreover; Deming was a farm boy. Deming's early boyhood experience in rural North America gave him

tacit knowledge of cooperation amongst farmers and a world-view that would later mesh, hand-in-glove, with his exposure to Japan.

That quote above was both a metaphor for what should be done in North American industry – teach cooperation (and listen and learn and put into practice), and an independent account of what Deming didn't do in Japan – if only people would listen.

Farmers “have always practiced cooperation”

“Cooperation has always been in Japan a way of life”

“As you learn, teach others”

Why did Deming mention farming? Because he wanted to use it as an analogy for...

Repeat this theme with Kaizen, why did Ohno quote about Toyoda at length. Because he wanted ...

Pull these thread back together again in Org Com.

Also mention in Org Com that it is too rich to criticise Japanese industry when American Agriculture is hugely subsidised.

Therefore it is ironic that Deming used it as an analogy. Farming in America, like Manufacturing in Japan seems to have stagnated on a higher plain.

Car Park for notes on timeliness – The market doesn't care, so long as it isn't exposed to your untimeliness. However you should be. It is highly likely that of two competitors, the one with a more timely process will be the more likely to succeed in the long-term (all else being equal)

Neave pg 42, “Problems are opportunities for improvement. And if you do not find out problems, be sure they will find you out.”

Neave pg 23 Maybe quote his interpretation of Shewhart. Then advance this in the introduction. Deming built on this his system of profound knowledge.

Neave pg 78 Control charts are a little like management accounting, they might alert us to a problem but they will not tell us what to do to identify the cause and to correct the problem. That is the job of other tools. Put this into the accounting section. Put the accounting section into here. Really SPC is a control mechanism, not an improvement mechanism. Just as buffer management is ditto. Don't forget to draw BM as a mechanical SPC operating at 2 sigma.

Neave pg 29 Quotes Deming

“Cooperation: Win-Win”

“Competition: Win-Loose”

Note how in Theory of Constraints win-win finds common expression, but the cooperation part has become implicit, not explicit. We ought to make it explicit.

Neave pg 89

“Nobody is saying that best efforts and hard work are inherently wrong; but knowledge –

Profound Knowledge – is needed to ensure that such virtues produce rewards rather than dissappointments.”

Knowledge is power, but behind knowledge lies theory, thus in reality it is theory not knowledge that is power!

Maybe near the end of this page incorporate; if the effect of variation is such that a lack of understanding of it leads to wrong decisions being taken, then a lack of understanding of interrelatedness (that is dependency and variation) has an even worse impact.

If a lack of understanding of variation leads to a worse effect than if things had been left alone, then a lack of understanding of variation and dependency causes a compounding of the problem. The compounding effect is what Theory of Constraints largely addresses.

The lack of understanding of dependency causes local optimization which only makes the system worse rather than better.

Deming understood variation, he understood dependency, but Goldratt provided a pragmatic way to address this compound error.

We tend to thing that Deming learnt a lot about cooperation from the Japanese. Several biographers think so (ref \$\$) and I don't doubt it. But read Deming's own record. He worked in the U.S. Department of Agriculture first. Agriculture was at that time, and to a certain extent even in mechanised countries still is, a communal undertaking. Even in the U.S. where small independent farms were the norm, cooperation was an essential mode of survival.

This, I will argue, is where Deming first learnt about the pervasive effects of cooperation. And it is against this background that he went to Japan and was open to a whole society in cooperation, not just the agricultural sector of a society.



This is from Out of the Crisis. Have to note the point that Deming puts job security as the end point. This is a consistent theme with Deming, we need to ask ourselves why. Because this is the only way to ensure on-going improvement. That would be the pragmatic answer. But maybe to Deming there was more than just adding value to capital. Deming was a true humanist.

Need to quote names for prior introduction of SPC to Japan. Charles Protzman and Homer Sarasohn 1948/49 are two (Neave pg 25). There are more in Bodek and more in the Deming obituary.

Confessions Of A Constraints Practitioner

What to do with Deming? That was a problem that I faced after considerable effort to put forward the ideas of Theory of Constraints without confusing or diluting it with other management philosophies. In part I was able to do this by ignoring Deming to some extent. I was fairly certain that statistical process control (SPC) was non-systemic but acutely aware that Deming's Theory of Profound Knowledge probably was. I knew that I had to address that issue but other matters also brought the subject to a head.

Firstly, in the section on paradigms there is a small section on quality and timeliness. This developed quite naturally, but it seemed that here was a basic dichotomy between quality and something else – timeliness; the something else that Theory of Constraints addresses much more fully than quality does although neither is mutually exclusive to the other. The commonality of course is that both quality and timeliness are a consequence of variation.

Secondly, in an attempt to maintain focus I had avoided reading much on Critical Chain Project Management book. However Leaches book on Critical Chain addresses in a rather specific way the function of project buffers as a defence against common cause variation in task completion. Once again a strong pointer towards the treatment of variation. The term “common cause” of course is a hallmark term of Deming's. The buffer's job of protecting against variation is so much clearer in the case of project management compared to production. In production, work-in-process already performs this function, and if anything initial efforts are aimed at reducing totally unnecessary excess protection - thus the buffer's job of protecting against variation is less clear, at least initially, in production applications.

Thirdly, I needed to go back in order to understand the interrelationships between Total Quality Control, Total Quality Management and Kaizen as I had used them to suggest a developmental pathway between reductionism and systemism. That job was made infinitely easier by Bodek's

timely book “Kaikaku.” Slowly the strands of relationships and interaction between Japan and the United States seemed a little less tangled – and incidentally this really was a tale of two countries – and for all intents and purposes still is.

Northrup (@) presented Deming’s 14 points in a treatment of modern operations management for accountants and it occurred to me for the first time that here was not a list of points for Western management per se but rather a list of points that only had relevance for Western management with reference to Oriental management. Deming had had a message to tell and I wondered how many working inside of the US could have understood it. Well, I reread The New Economics for the first time since becoming interested in Theory of Constraints and was overwhelmed by the congruence between the two approaches. Now it is well that I did this after writing this website, else I might have more easily just referred people to Deming.

Deming’s Theory of Profound Knowledge and Goldratt’s Theory of Constraints are hugely congruent but complementary pair. If you can interlace the fingers of both hands you will understand what I mean. The commonality between the two Theories at the highest level suggests that both have converged via different pathways towards several fundamental aspects of systems.

Certainly some Theory of Constraint practitioners use Deming’s Theory of Profound Knowledge as a framework or a context with which to present Theory of Constraints – evidence of the congruent but complimentary relationship. Lepore and Cohen have meshed the two approaches together (\$). Further evidence of the complementary nature of the approaches.

Let’s look at this commonality.

Systems

Characteristic	Goldratt	Deming
Whole System	System	System
Whole System	Goal	Aim
Whole System	Necessary Conditions	Facts of life
Whole System	Optimize	Optimize
Constraint Entities	Exploit	Exploit
Non-constraint Entities	Subordinate	Obligation of a component

(When did the System of Profound Knowledge become the Theory of Profound Knowledge? I don’t know – but Lepore and Cohen use it page 159-160).

No, no, no.

We should evaluate Deming with reference to the rules of engagement. Thus;

Define the system.

Define the goal of the system.

Define the necessary conditions.

Define the fundamental measurements.

Define the role of the constraints.

Define the role of the non-constraints.

Then we can address in text; aims and constancy of purpose, facts of life, and obligation of a component.

Also subordination in terms of long-term for individuals should be congruent with long-term for the system (MAYBE this is the paradox of communalism – not the failure to recognize a few key leverage points (a spatial local/global issue or policy issue) – but rather a reluctance to substitute short-term pain for long-term good (a temporal issue). (Yippy!!) This goes back to Hurst's crisis and renewal. Use New Zealand or Britain as examples. So again a subordination issue.

Where the emphasis is on co-operation rather than competition the avoidance of short-term pain may become acute. In more competitive societies it can be explained away as efficiency of the markets or some social-Darwinian argument about fitness (what ever that corrupt and circular argument means).

Lets run a language check (Goldratt and Deming vs. The Rest)

Characteristic	Reductionist View (The Rest)	Systemic View Deming/Goldratt
	Part	System
	Cost	Throughput
	Competition	Cooperation
	Individual	Group
	Short-term (quarterly)	Long-term (decades)
	Shareholders	Stakeholders
	Capital	Expertise
	Efficiency	Effectiveness
	Local	Global
	Independence	Interdependence
	Invariant	Variable
	Optimization	Subordination/obligation
	Deterministic	Stochastic
	Resources	People
	Machine	Culture
	Hierarchy	Relationships
	Management	Leadership
	Analysis	Synthesis
	Induction/Deduction	Abduction
	Explicit	Tacit
	Kaizen	Kaikaku
	80:20	99:1

	Detail	Dynamic
	Extrinsic	Intrinsic
	Equivalent & Similar	Equivalent & Dissimilar
	Discrete (safety)	Aggregate (safety)
	Common Practice	Common Sense
	Capacity	Flow
	Activation	Utilization

Cooperation and Competition is context specific. Deming helped frame this in Japan in terms of nation/state.

Learning From Japan

Bodek (2004) pg 238 “Deming is generally credited with the post-war introduction of quality concepts to Japan, although the reality is much more complicated, and there is considerable evidence that he learned as much from Japanese thinkers like Kaoru Ishikawa and Taiichi Ohno as he taught them.”

Lepore & Cohen (1999) pg 155 “... the writer reported Deming’s reply to the question of how he would like to be remembered in his native land: ‘Well, maybe ... as someone who spent his life trying to keep America from committing suicide.’”

Obligation of a component (subordination) pg 97 TNE

Constancy of purpose = the goal pg 51

The goal being for everyone to gain – “stockholders, employees, suppliers, customers, community, the environment – over the long term.” Goldratts more recent strategic goal is much closer to this ideal than his earlier one for publicly traded companies.

Doing Our Best

Deming has SO much on the aim (pp 50-56) that it would be best to quote extensively here and make a reference from Measurements.

“It is not enough to do your best;
you must know what to do,
and THEN do your best.”

W. Edwards Deming quoted by Bodek pg 236. We can extend this somewhat. In order to know what to do, we must know which the constraints are and which the non-constraints are.

We examined the same problem early on, it was the central theme that we needed to overcome in order to truly appreciate the power of Theory of Constraints. We wrote;

Conflict arises not because people are failing to do their best, but because everyone is doing their best.

Resources are to be utilized in the creation or protection of throughput, and not merely activated.

And in order to do that we must know which are the constraint activities and which are the non-constraint activities. This is the central difference between Deming and Goldratt. Well not quite but almost. (See quality is concerned ... below).

Wheeler uses the term “numerical naiveté” to describe our often imperfect understanding of variation. Maybe we should extend that term to also embrace our often imperfect understanding of dependency and independency.

There are many things in life that are essentially dependent or interdependent upon one another. Dynamic complexity is an expression of this dependency or interdependency albeit that a lead or lag in time or space exists between the events. A large part of the systems thinking approach is to do with the recognition of the lead/lag times between events. Detail complexity in contrast is an expression of independency between events.

Quality is concerned with independent outcomes – detail complexity. Timeliness is concerned with dependent or interdependent outcomes – dynamic complexity.

Subordination

Subordination was no mystery to Deming; “The secret is cooperation between components toward the aim of the organization. We can not afford the destructive effect of competition (&).”

Here is a perfect description of subordination from Wheeler – one of Deming’s students. Look for the same description from Deming himself.

Wheeler, J. D., (2000) Understanding variation: the key to managing chaos, pg 99

The optimization of each department will always result in a plant which is suboptimal. The optimization of the whole system will require that some departments be operated suboptimally. However, by encouraging competition between managers, most organizations make it impossible for departments to cooperate for the good of the company.

Myth Of Selfishness & Efficiency Liker’s long quote here; Liker, R., (2004) The Toyota Way, pg 71

“In the last few decades, the world has been moving in the direction of capitalism as the dominant socio-economic system. The prevailing belief is that if individuals and companies pursue their, self-interests, supply and demand will magically lead to innovation, economic growth, and overall economic well-being for humanity. While it is comforting to think we can all simply do what is best for our short-term economic interests and all will be well in the world, there is a dark side to the pursuit of self-interest as the engine for economic growth. We see it with Enron and other scandals and the aftermath of extreme distrust of large corporations and the morality of corporate executives.. We see it when there is an economic downturn and millions of people are thrown out of their jobs and fend for themselves.”

Followed by Deming pp 50-51

“What is a system?. A system is a network of interdependent components that work together to try and accomplish the aim of the system.

A system must have an aim. Without an aim, there is no system. The aim of the system must

be clear to everyone in the system. The aim must include plans for the future. The aim is a value judgment. (We are of course talking here about a man-made system).

The components need not all be clearly defined and documented: people may merely do what needs to be done. Management of a system therefore requires knowledge of the interrelationships between all the components within the system and of the people that work in it.

A system must be managed. It will not manage itself. Left to themselves in the Western world, components become selfish, competitive, independent profit centers, and thus destroy the system.

The secret is cooperation between components toward the aim of the organization. We can not afford the destructive effect of competition.

Management's job. It is management's job to direct the efforts of all components toward the aim of the system. The first step is clarification: everyone in the organization must understand the aim of the system, and how to direct his efforts toward it. Everyone must understand the danger and loss to the whole organization from a team that seeks to become a selfish, independent, profit centre.

Recommended aim. The aim proposed here for any organization is for everybody to gain - stockholders, employees, suppliers, customers, community, the environment - over the long term. For example, with respect to employees, the aim might be to provide for them good management, opportunities for training and education for further growth, plus other contributions to joy in work and quality of life."

What we see in Deming is; (1) there must be a goal, (2) there must be knowledge of the interrelationships, (3) there must be subordination, (3) everybody must gain.

Knowledge of the interrelationships means knowing what is best (constraint vs. non-constraint). More directly (pg 52) "Anything less than direction of best efforts of everyone toward achievement of the aim or aims of the whole organization is a directed verdict toward failure to achieve best overall results."

Cooperation – Not Competition

There is a very long quote from Richard Seebass in Deming's The New Economics (pp 61-62). Clearly Deming is trying to set the record straight of his own involvement in Japan;

"No spread of knowledge from America to Japan took place when Dr. Deming went there in 1950 at their request to help Japanese with quality. What he taught in Japan did not exist in America. He did not export to Japan American methods. He taught there the principle of a system. Japanese management and engineers listened and learned, put into practice what he taught. He relied on cooperation between people and between companies. Cooperation has always been in Japan a way of life."

Timeliness & Quality

Quality and variation are different sides of a coin. As variation decreases quality increases. Timeliness and variation are also different of a coin. As variation decreases timeliness

increases. Variation is common to both quality and timeliness considerations, but are they the same coin?

Variation in timeliness can be protected against by aggregation and buffering. Variation in quality can't. Quality is so much closer to the local and reductionist in nature while timeliness is so much closer to the systemic and global in nature.

Quality depends upon analysis, timeliness depends upon synthesis.

This helps to explain the relative ease with which product quality improvement initiatives are introduced (Lean and TQM), but the relative difficulty when timeliness improvement initiatives are introduced. Timeliness can be improved as a consequence of reductionist quality initiatives, but never as well as if timeliness is approached from an aggregate or buffering perspective. It goes back to the summing of independent events vs. the summing of dependent events. Product quality improvements (and consequent timeliness improvements) are largely independent events. Timeliness improvements per se are largely an application of dependent events.

To recast this in one more way, the dependency in time through a process is much greater than the dependency of various quality details in a product.

Deming And Japan

Six Sigma

You can have a go at six sigma if you like. There is Liker's paragraph about GE and analysts, there is Deming's jibe on America/Japan pg 49 Out of the Crisis, "We in America have worried about specifications. In contrast, the Japanese have worried about uniformity, working for less and less variation about the nominal value."

Thus if America is worried about specifications it does not seem so strange that Six Sigma should be modelled on the capability limit specification of six standard deviations. The capability index itself being a measure of whether the natural variability in the process can match the specifications of the customer.

"Conformance to specifications, Zero Defects, Six Sigma Quality, and other nostrums, all miss the point (so stated by Donald J. Wheeler, 1992).

Superficiality of ISO 9000

Deming once commented on an unrelated matter "Haven't we a right to expect something better from a Committee? But they are only doing their best." Well, he was referring to a Senate committee but it might as well have been an ISO committee.

Ever been associated with ISO 9000? Ever seen your quality go up, your productivity improve, or your profit increase as a consequence? Didn't think so. Because it can't.

ISO 9000 must be the ultimate reductionists' decimation of a systemic approach. Sure it generates auditors fees – but little else. It is the ultimate in the need to convert tacit experience

into explicit knowledge - “manuals.” In doing so it robs employees of their pride of workmanship. Now someone from outside the firm (usually) wants employees to state explicitly everything that they have learnt (both explicitly and tacitly) since they were apprentices to craftsman. Well they can't. How do you commit to an ISO manual that when the belt sander starts to sound in a particular way, it is working too hard, or when the look of the cutting edge of new end mill looks a particular way that the grinding lathe is running too fast. You don't. But the poor sods who write ISO manuals are undeterred by such detail. About all it really illustrates is the gulf that exists between Western corporate management (and academics) and real work.

Paradox of Communalism

There is a paradox in the way organizations behave as communities. In this page we have highlighted some of the short-comings where different systems interact and have different goals and measures. But even within a system there is a paradox – they should work so well when we know the system and the goal but most often they don't. So what is this paradox of an organization as a community – the paradox of communalism?

Well Deming's cooperation/competition dichotomy is the expression of this paradox. In the paradox of systemism we noted that even when the role of the constraints and the role of the non-constraints is known – the systemic/global optimum paradigm – it is too easy to slip back in the mode of the reductionist/local optima paradigm. To grant equivalence to all parts of the system. So too with the paradox of communalism; except maybe more so.

The more so arises because currently there are two cases;

Those that don't understand at all.

Those that understand and revert.

In the reductionist/local optima case there is general equivalence. All parts of the system are considered to have an equal contribution to the system as a whole. In this case it is only possible to have every part competing against every other part (profit centres by another name) or fully cooperating with one another. The first is the capitalistic system, the second is the communistic system.

START AGAIN

Just as in the paradox of systemism there is a difficulty in making the transition from the reductionist/local optima paradigm to the systemic/global optimum paradigm. So that even those that say they are working under the later often revert to the former.

Again the central point is the failure to move from the recognition of all parts having generalized equivalence to parts have generalized inequivalence. Although we will refine this notion of inequivalence in a moment.

In the paradox of systemism we recognize some few entities as constraints and all other entities as non-constraints. Let's change the wording for a moment to remove the notion of inequivalence. In an organization as a community we will have leverage points and we will have non-leverage points.

UP TO HERE

We can express this as a quasi formula.

The paradox of communalism can be described as

Success = Co-operation / Competition

we can redraw it as follows.

Actions under adversity

Why is it that under adversity – domestic, military, or economic, we cooperate so much more easily. Is it because the system is suddenly so well defined? Is it that the goal and necessary conditions, either implicit or explicit are so well understood? Is it that the leverage points are quite clear? And is that once the leverage points are known that the other parts of the system can cooperate fully for once?

The adversity is external to the system. The adversity defines the system by default. The system must then compete against (and prevail over) the external adversity, and in order to do so the system must cooperate internally.

By default we have leverage points and non-leverage points.

Central Tendency.

Simons wrote about central tendency, it is not a central tendency but a local tendency. A localization in time and space. It is infinitely more easy to compete than to cooperate – that doesn't indicate validation of economics "selfish individual" it only validates that people, currently, when faced with a dynamic situation, in absence of a well defined system and a goal, will form and orient about a more localized one, one within our span of control.

Simons pg 24, A Theory once placed in practice becomes normative.

Why have we persisted so long with this notion that competition is good, that the sum of the local self-ish short-run steps is coincident with the long-run global good of the system? The answer is clear in science. It is the mis-understanding and mis-appropriation of something mis-understood that is largely responsible for the current position and that is the Darwinian revolution.

Darwin was writing about organic evolution, some people at the time abducted the Theory to explain non-organic/non-inherited (Lamarkian) development, these were the social Darwinists. We need to examine this movement to really understand the source of our confusion and continued confusion.

The Myth of Social Darwinism

Well you are really going to have to read up on this now. Now you have a social reason based in a mis-application of science to explain so many things that no others have brought together in the same place.

Industrial Dynamics – Crisis and Renewal

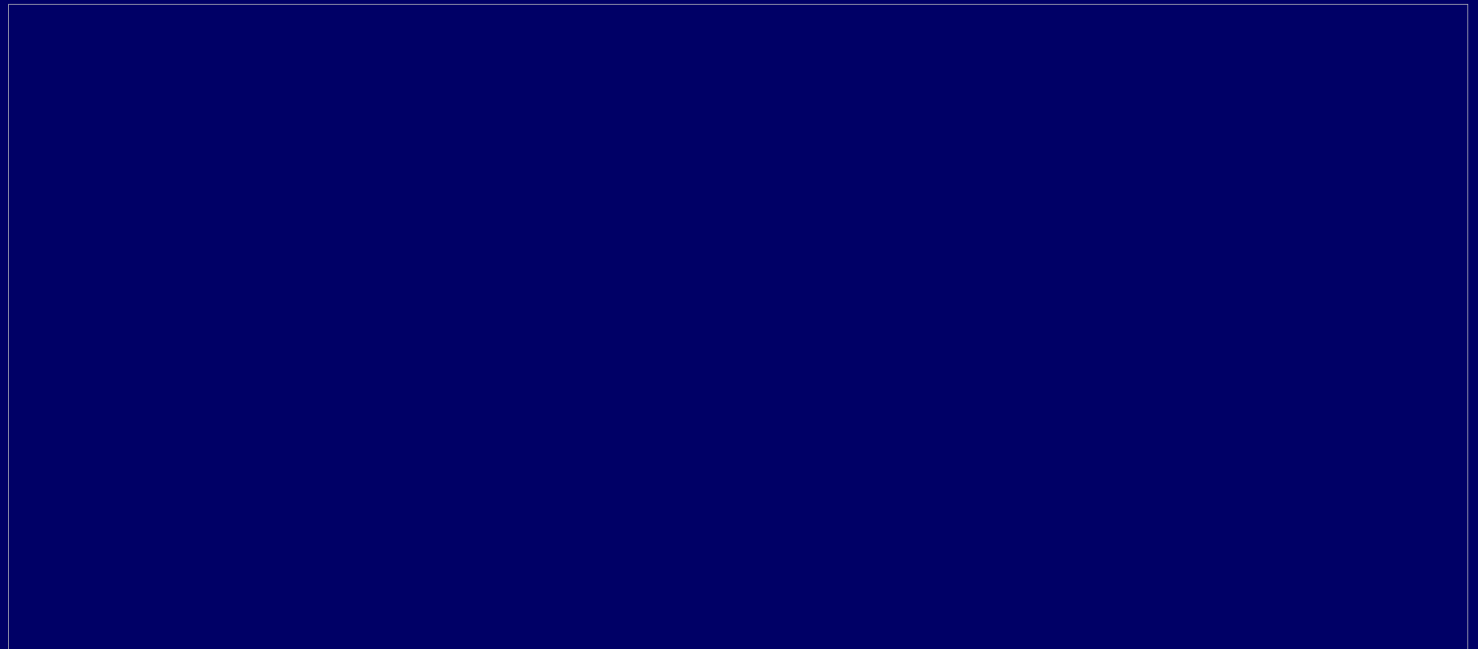
From some notes I handwrote but sounds quite close to Hurst's views; maybe boom and bust cycles aren't due to lead and lag times (as suggested by industrial dynamics) but maybe they are related more to a series of short-run decisions, one after another, each time making the

disparity between the short-run and the underlying or fundamental long-run trend greater and greater. Until such time as there is a short-run correction back to the fundamental trend.

This is what David Hurst was essentially suggesting in *Crisis and Renewal*. The dynamic tension between short-run trend increases until there is a crisis – a breaking point – at which time the short-run correction is a sharp return to the long-run trend.

Maybe the mechanistic model of feedback loops is too simple. It suggests that we can't know the long term feedback until some time into the future. I believe however, what we chose to notice, is more important. We chose to notice the incremental difference between successive short-run decisions and we chose not to notice the sum of the differences between the short-run and the long run. We can view this as follows;

We have a long-term historic trend and its future prediction.



Along comes a short-run benefit, we go for it.



Someone comes up with another short-run solution that has a similar effect to the previous one, well we go for that one too. We have to maximize our return to the shareholder after all.

Actually we must be damn clever, the market is quite buoyant and we see another short-run gain.

So some companies are just plain lucky, but ours is driven by skill.

Ah, that's nothing, just a short-term market correction

The market continues to correct and we find ourselves at about the position of the long-run trend. Oh darn.

What would have happened if that first increment had been a long-run change instead? Let's see.

Bears thinking about, doesn't it?

References

(@) Northrup, C. L., (2004) Dynamics of profit-focused accounting: attaining sustained value and bottom-line improvement. J. Ross Publishing, 272 pp.

(&) Deming, W. E., (1994) The new economics: for industry, government, education. Second Edition. MIT Press, pg 50.

(%) Lepore, D., and Cohen, O., (1999) Deming and Goldratt: the theory of constraints and the system of profound knowledge. The North River Press, 179pp.

To place Deming in perspective he was a part of the generation of statisticians who learnt from and then succeeded Shewhart. Other contemporaries from MIT were Juran and Feigenbaum. Wheeler today represents the 3rd generation in this lineage from Shewhart. And what existed prior to Shewhart's work in the 1920's. Well the mathematical treatment of product variation wasn't an issue prior to the 1920's because mass production made-to-tolerance had hardly began.

A Note to myself – which is probably already done;

Somehow incorporate Deming's what is best for everyone long term is also best for the system into Deming page and link back to subordination solves most cloud conflicts.

Here is another cloud based on the above but ported from Liker;



TOC - Theory of Constraints, Quality

Lepore D., and Cohen, O. (1999) Deming and Goldratt, pg 54

For Walter Shewhart, Deming's great teacher, Quality is defined as "On target with minimum variance."

Anyone For Irony?

Want to see how pervasive the system is that we are immersed in. Consider then that Deming taught the Japanese the value of systems (before anyone coined the word "systems thinking" mind you), he recognized the value coming from a reductionist environment.

Look at the Japanese, or at least the TQM and kaizen material, purely reductionist, they recognized the value coming from a systemic environment.

But what of the transfer. Well Deming's work was absorbed naturally into Japan's collective society. Born by exception in the west and assimilated by familiarity in the east. And Shigeo, and companies work was absorbed naturally into America's competitive society. Born by exception in the east and assimilated by familiarity in the west.

Stranger things may have happened.

The reiteration at the end of this page must be;

“It is not enough to do your best;
you must know what to do,
and THEN do your best.”

In modern serial processes that are either internally constrained or externally constrained with and internal control point then best means;

Resources are to be utilized in the creation or protection of throughput, and not merely activated.

In other words what is best depends upon the viewpoint of whether we are addressing a constraint or a non-constraint.

That is the critical difference. That is what moved Theory of Constraints one step further than the Theory of Profound Knowledge.

Deming said that 90% of the problems in a system are beyond the control of the employees and are a consequence of management.

Can part of the reason be that for serial systems we haven't really given management a clear enough understanding of how to manage when dependencies are so high?

Robert Greenleaf raises this very problem – if most of the problems are caused by management and management are people.

(My manuscript notes, Covey page 3. Deming said that 90% of the problems are due to the bad system not bad people. Greenleaf says, yes but, people are the programmers of the system. To which we might invoke Deming's comment that it is not enough to do your best, you must know what is best and then do it.

Thus we can account for the programming problem by the people that cause 90% of the problems. It is the failure to know what is best, it is a failure to move from the successful paradigm of localized departments/sections to the whole system, be that the firm, the company, or the corporation.

Our mental model is incorrect, or insufficient to date, but we know what to do now. Many firms have reported the rapid and substantial results that accrue (%)

Update – Natural Process Charts

Detail some of the arguments of Wheeler's here; including new nomenclature and also describe numerical naivety.

Johnson, H. T., (1992) *Relevance Regained*, pg 49

In any plant striving to achieve manufacturing excellence, standard cost performance systems are anathema - especially if incentive compensation is geared to controlling standard-to-actual variances. Those systems encourage waste (excess production), delay (longer lead times), and imbalance (end-of-period) production spurts to reach "efficiency" targets). Moreover, they do not provide motivation for continual change and improvement in the methods and parameters of production.

Johnson, H. T., (1992) *Relevance Regained*, pg 50

I don't believe any management accounting textbook or any management accountant has ever pointed out that adjustments people make to reduce standard cost variances destabilize processes and add to the costs of doing business.

See also numerical naiveté (pages 49-50 are on this although they don't call it so).

Quote Longmuir (pg 51 Johnson and Kaplan) who used Taylor's work standards concept extended to cost standards. With any deviation from a trend line termed good or bad. Thus we can see the idea of lack of process variation goes back to the inception of cost accounting.

(pg 52) Interestingly the first formalized approach to variance costing recognizes what Shewhart and Deming would come to call assignable cause and ... or common cause and special cause.

Shigeo Shingo

Mention that Shingo does away with process charts whenever he can (and that we will cover this) and that is certainly a feasible and desirable thing wherever a discrete tangible product is involved. However, for measuring other kinds of processes – outcomes if you like, we must still rely on this very useful technique to filter the useful data from the accompanying "noise."

Reductionist Versus Systemic Problem Solving

Our whole experience is so strongly focused on reductionist problem solving that we sometimes fail to understand how to solve systemically.

All of the reductionist methodologies used in Kaizen can, are, and should be used within the systemic paradigm of Theory of Constraints. There are many local problems with system-wide impact that can not be solved in any other way. We know how to solve by reduction, we seek to break the problem down into smaller and smaller units until a solution is found. How then do we solve by systemism?

We solve by systemism by expanding out and away from our initial position. This doesn't seem so obvious, how can this actually help solve the problem? It solves the problem in the end by placing it in an expanded context where it either dissolves as a problem entirely or if not entirely

then through compromise at worst, or subordination at best until it is bearable.

Each time we expand the system out (the very opposite of reductionism) we must check to see if the problem still exists, and if it does whether new and previously inaccessible relationships can be brought to bear on the problem. Part of the skill must be in reframing the problem in the larger context, without being able to do that we can't begin to check for new previously inaccessible relationships.

In a way it looks like this;



In reductionism we may solve the problem with a specific change of some sort to a part, or a part of a part – but often times that solution will have negative ramifications to other parts that were not taken into account.

In systemism we may also solve the problem with a specific change of some sort to a part, or a part of a part, but taking into account the interrelationships of the whole. Moreover we may solve the problem by reframing until the existing problem is not changed but simply becomes subordinated to the whole, and in that context the original conflict is resolved.

The crux of the matter is that we can't stand still with our initial problem, we must either begin to analyze, or synthesis (or abduct).

Summary – Necessary But Insufficient

Knowing what is best is necessary but it is insufficient. Having access to and familiarity with the correct mental model is knowing, we still need doing. There are two basic ideals that we must satisfy first – if we are to have a true process of on-going improvement rather than a short burst of enthusiasm (and a long period of soul searching afterwards).

To properly understand these two basic ideas we have to be mindful of the contingent nature of our recent industrial past and the experience of more than one culture in isolation.

Let's do that by retracing our steps as part of the modern industrial world first in the West at the turn of the twentieth century, and then in the East from the 1950's to the present, before seeking to synthesize the lessons for modern industrial organizations.

Deming and the System of Profound Knowledge

Probably from Leach. Uncertainty isn't the problem – but maybe the way that we handle it is the problem.

“Principles for the transformation of Western management” only makes proper sense if we add “compared to Eastern Management.”

I picked out the relevant parts of the 14 points that illustrate this to me.

... and to provide jobs

Western management must awaken to the challenge

... on a long-term relationship of loyalty and trust

The aim of supervision should be to help people and machines and gadgets to do a better job (Liker labors a point about the differences between supervisors at Toyota/GM NUMMI and GM std factories).

Substitute leadership

abolishment of annual or merit rating and of management by objectives

the transformation is everybody's job.

Systems Thinking

Where is the uncertainty in systems thinking? We know already that there is no concept of subordination, but look hard and see whether you can find information on uncertainty or common cause variation. There is none, because systems thinking is essentially mechanistic in its approach.

Toyota Way

We know where uncertainty is in TPS, Ohno tried to remove it or reduce it with SPC and kaizen

Subordination

Here is a perfect description of subordination from Wheeler – one of Deming's students. Look for the same description from Deming himself.

Wheeler, J. D., (2000) Understanding variation: the key to managing chaos, pg 99

The optimization of each department will always result in a plant which is suboptimal. The optimization of the whole system will require that some departments be operated suboptimally. However, by encouraging competition between managers, most organizations make it impossible for departments to cooperate for the good of the company

Car Park

(Summary) They Changed The Economy Of The World

They changed the economy of the world – quote from Kilian pg 58. Deming was a systemist. Since at least 1950 he was teaching a whole system approach. It is very much likely that he was doing this since meeting Walter Shewhart in the 1920's. How come then, that

The following quotation comes from Deming; "The system is such that almost nobody can do his best. You have to know what to do, *then* do your best (Walton pg 32). It comes from his lectures in the mid-1980's, thirty years after his work in Japan, 40 years after his work with the American defence department and 50 years after his exposure to the thinking of Shewhart. How peculiar, how incredible sad. Was no one listening that no one understood how quality had improved in Japan.

And here now, 20 years on, the localized focus of six sigma reigns supreme because once again we have forgotten that the system is such that almost nobody can do his best. Yet we continue to try.

He continues;

"With respect to Deming, one additional point calls for comment. He is intensely opposed to the 'merit system and traditional performance appraisal.' What he is opposed to, of course, is merit award based upon the crude concept of performance as a simple statement of the extent to which a person achieved a given targeted output. He is rightly (and passionately) against all mechanistic approaches of this kind, and against the managerial mentality that confuses merit with output – for as he argues so trenchantly, output may be influenced by all kinds of circumstances that are more under the control of managers than of the subordinates whose merit they are evaluating."

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