

UNDERSTANDING AND APPLICATION OF DEMING'S SYSTEM OF PROFOUND KNOWLEDGE IN HEALTHCARE

Experiences of and Lessons Learned by the Healthcare Value Network's "Acceleration & Assessment Team"

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Abstract:

It is uncommon to find a healthcare organization's management that will state that they are following Dr. W. Edwards Deming's management philosophy. It is more common to find organizations that are pursuing the application of what is being called "lean". Starting in 1950, Dr. Deming brought new knowledge to Japanese managers and engineers, many of who then used this knowledge to design their management systems. In 1988, The Shingo Model for Operational Excellence was created based on the study of results and behaviors of companies demonstrating superior performance, as well as the principles of thought-leaders like Dr. Deming who helped shape the thinking behind their management systems. In the early 2000's, healthcare organizations (including ThedaCare) began looking to Toyota and other companies for methods to improve quality while also decreasing cost. The ThedaCare Center for Healthcare Value, created in 2008, and the Healthcare Value Network (HVN) created the following year, selected the Shingo model as a way to provide guidance and to help the member organizations assess their progress on the lean journey. This paper discusses the HVN's Shingo-based assessment process (which has Deming-based principles) and provides examples of application from some of the HVN member organizations.

The Prevailing Style of Healthcare Management:

The prevailing style of management in healthcare is the same as the style described of Western management by Dr. Deming.^(1,2) It is based on a short-term view, where management sees their job as achieving results by any means necessary. Committees and management batch problems for solving long after the problems have occurred, and the causes are commonly traced back to people. Management spends most of their time in boardrooms or conference rooms without any real understanding of the day-to-day operations, far removed from where the value is added (by the caregivers). Healthcare managers have been led to believe that if they manage the parts of their organization well, then the parts will add up to a well-run organization. This reductionist view may work well for simple systems, but it produces poor quality, high costs, and a lack of cooperation when applied to complex systems like healthcare delivery.

Dr. Deming and Japanese Industry:

Dr. Deming's contributions to management in Japan have been well documented.^(3,4,5) He brought new knowledge to Japan over several visits, beginning in 1949 and on through the 1960's. The Deming Prize, established in 1951 in commemoration of Dr. Deming, was originally designed to acknowledge Japanese companies for major advancements in quality improvement.⁽⁶⁾ The foundation of Japanese management seems to be consistent with Dr. Deming's teachings and was influential⁽⁷⁾ in his 1986 book, *Out of the Crisis*. In it, Dr. Deming wrote:

"It was vital not to repeat in Japan in 1950 the mistakes made in America. Management must understand their responsibilities. The problem was how to reach top management in Japan. This hurdle was accomplished through the offices of Mr. Ichiro Ishikawa, president of the great Kei-dan-ren (Federated Economic Societies) and president of JUSE⁽⁸⁾ who in July 1950, brought together the 21 men in top management. Further conferences with top management were held that summer of 1950 and still more on two trips to Japan in 1951, again in 1952, more in subsequent years."⁽³⁾

While there is evidence of Dr. Deming's influence on Japanese management, it is not possible to demonstrate cause and effect. Dr. Deming's early teachings in Japan in the 1950's and 1960's were simpler than his messages of the 1980's and 1990's. He was known to state later that, "I didn't teach the 14 Points in Japan, I learned them there."⁽⁷⁾

Toyota, TPS, and its Introduction to Healthcare:

The Toyota Motor Company was one of the companies that learned from Dr. Deming's teachings and built a way of thinking and managing that produced noticeably different results than other companies. Shoichiro Toyoda, Honorary Chairman and Director of Toyota stated, "There is not a day I don't think about what Dr. Deming meant to us. Deming is the core of our management."⁽⁹⁾ The Toyota management approach is now commonly referred to

as “lean,” a term that was first used to describe the Toyota methodology in 1987 by John Krafcik, working with Womack and others,⁽¹⁰⁾ and described more completely by Womack, Jones, and Roos in 1990.⁽¹¹⁾

Healthcare organizations began exploring the use of lean methods in the late 1990’s. Some examples include ThedaCare⁽¹²⁾ in Appleton, Wisconsin, Virginia Mason⁽¹³⁾ in Seattle, and Seattle Children’s Hospital.⁽¹⁴⁾ In 2008, The ThedaCare Center for Healthcare Value (The Center) was founded by Dr. John Toussaint, CEO Emeritus at ThedaCare, as a separate, not-for-profit 501(c)3 organization with the mission to build on the success of the application of lean at ThedaCare, and foster the redesign of three interdependent components⁽¹⁵⁾ of the healthcare industry in order to provide improved value for patients.

One of the initial components of The Center was the establishment of the Healthcare Value Network as a peer-to-peer learning system for healthcare organizations in North America.⁽¹⁶⁾ The mission of the Network is threefold:

- * Identify and spread current better practices among all member organizations.
- * Accelerate the transformation journey for each member organization.
- * Drive change in the larger healthcare system.

The Healthcare Value Network and The Shingo Model for Operational Excellence:

In 2009, Network members desired a common definition of the term “lean” as well as a common assessment method to help member organizations to gauge their maturity along their lean journey. The Center began collaborating with the Shingo Institute⁽¹⁷⁾ to learn how The Shingo Model for Operational Excellence and the associated assessment process would apply in healthcare organizations. The Center published a White Paper on this initial work in 2011, describing the work of one of the HVN affinity groups – the “Acceleration and Assessment Team” in learning and applying the Shingo model and using the Shingo-based assessment process.⁽¹⁸⁾

The Shingo Institute is a not-for-profit organization named after Japanese industrial engineer Shigeo Shingo, PhD, an expert on the concepts, management systems, and improvement techniques of the Toyota Business System from which lean thinking evolved. Dr. Shingo was Taiichi Ohno’s mentor (Ohno has been described as the “father of the Toyota Production System”). For more than 20 years The Shingo Institute, based at Utah State University, has studied and recognized organizations that demonstrate a culture in which the principles of operational excellence are thoroughly embedded into the thinking and behavior of leaders, managers, and associates.

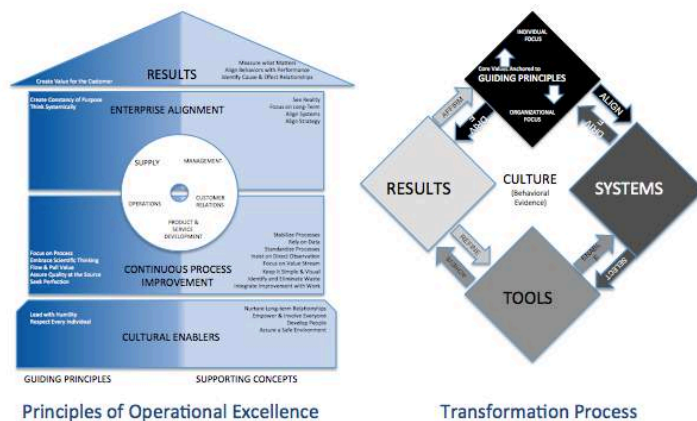
The Shingo assessment process and Shingo model provide the basis for powerful and focused improvement strategies. Through years of application, Shingo assessments have repeatedly confirmed that:

- * Business and management systems drive behavior and must be aligned with correct principles.
- * Operational excellence requires focus on both behaviors and results.
- * There is a relationship between principles, systems, and tools.

The Shingo model is comprised of two elements, shown in Figure 1. An organization that is interested in pursuing a cultural transformation using lean principles uses the four dimensions of the “Principles of Operational Excellence” (the left-hand side of the model) to understand the ideal behavior, and to assess if systems are producing these desired behaviors at all levels of the organization, and in all areas of operations and support functions. The “Transformation Process” (the right-hand side of the model) describes how organizations adjust systems to drive ideal behavior.

Figure 1

Two Elements of the Shingo Model



Principles, Guiding Principles, and A System Of Profound Knowledge:

To reiterate a point made previously, Dr. Deming did not teach his “14 Points For Western Management,” in or to Japan.⁽⁷⁾ They were first described by him in the early 1980’s and published in 1982,⁽¹⁹⁾ and again in his 1986 book,

Out of the Crisis, where he referred to them as the “Principles for Transformation of Western Management.”⁽²⁰⁾ These are summarized in Table 2 below, along with lean principles described by other authors. Womack and Jones described five principles of lean thinking.⁽²¹⁾ Jeffrey Liker described 14 principles in his 2004 book, *The Toyota Way*.⁽²²⁾ Toussaint and Berry described six principles that constitute the essential dynamic of lean management.⁽²³⁾

The Shingo Institute describes “10 Guiding Principles,” in the Shingo model in four categories (Cultural Enablers, Continuous Process Improvement, Enterprise Alignment, and Results.)⁽²⁴⁾ These ten principles are called “guiding principles” because they have the attributes described in Table 1 below.⁽²⁵⁾ Principles are not the same as “values.” For instance, many organizations have stated values such as: innovation, teamwork, loyalty, precision, and collaboration. The attributes that distinguish values from principles are also described in Table 1.

Table 1

Principles	Values
Universal – Principles are based on fundamental scientific, logical truths arising from observation and experimentation. The empirical evidence solidifies the principle as a natural law that is self-evident and self-enforcing – regardless of the environment.	Localized – Our personal values are shaped by our economic, social, and environmental circumstances. Based on these three factors, we develop our core beliefs and philosophies that we hold about life, its purpose, and our own purpose.
Objective – Principles are not persuaded by emotion. Principles do not depend on the beliefs or feelings of any person or group of persons – they are resistant of change with shifts of opinions.	Subjective – Because values are unique to the person or a group, their interpretive view of the world varies. For example, thieves and leaders can both value teamwork, but their interpretive view of the value might not have the same outcome.
Govern Consequences - Regardless of our personal understanding or belief in the principle, it still enforces a predictable outcome or consequence (positive or negative).	Govern Behavior – Values are our guidelines for living and govern how we respond to our environment, or how we behave.
Predictable - By understanding the consequence of the principle, we can accurately predict the logical outcome.	Unpredictable – Because our values are shaped by personal factors, they become interpretive to how we see our world. This makes it difficult to accurately predict a consistent outcome.

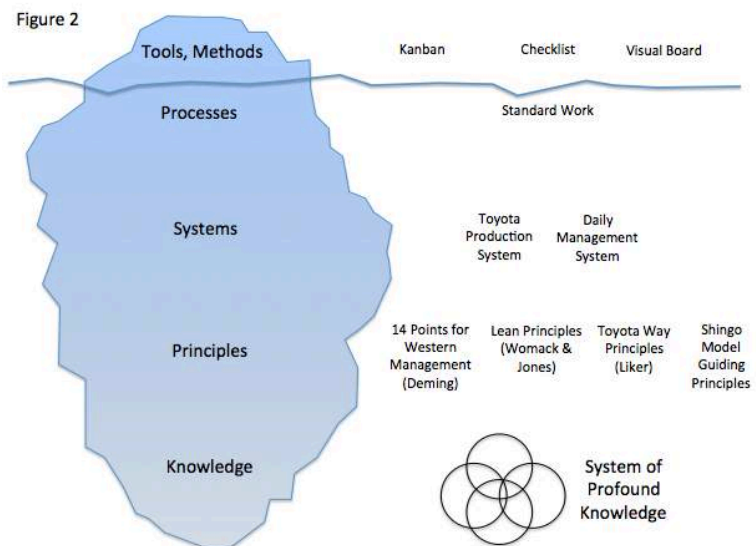
In addition to the “10 Guiding Principles,” the Shingo model includes 20 “supporting concepts” which are critical to pay attention to, but may not stand up to the rigor of being universal, timeless, and self-evident.

Considering and applying all of these principles and supporting concepts would require remembering many elements. Dr. Deming provided us with a solution to this challenge in what he described as “The System of Profound Knowledge” in his 1993 book, *The New Economics*.

“The layout of profound knowledge appears here in four parts, all related to each other:

- Appreciation for a system
- Knowledge about variation
- Theory of knowledge
- Psychology

One need not be eminent in any part nor in all four parts in order to understand it and to apply it. The 14 points for management (*Out of the Crisis*, Ch. 2) in industry, education, and government follow naturally as application of this outside knowledge, for transformation from the present style of



Western management to one of optimization.”⁽²⁶⁾

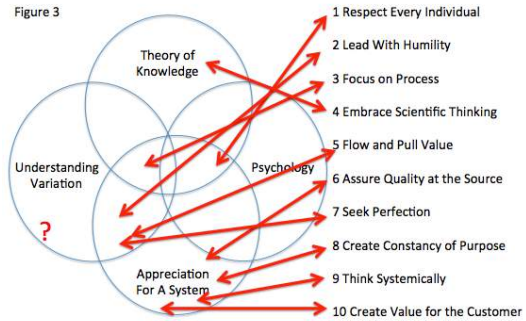
Figure 2 (above) is one way to represent the relationship between Deming’s principles and his “System of Profound Knowledge” and the Shingo model’s systems, processes, and tools. Using the metaphor of the “iceberg” (described by Barbara Lawton, PhD,⁽²⁷⁾ then by Mike Stoecklein)⁽²⁸⁾ what you might see on the surface in any organization are the visible tools and other artifacts. Just under the surface, less visible, are the processes in which the tools are embedded. Deeper still are the systems, which contain the processes. If you go deeper still, you would discover the principles upon which the systems are based. Looking still deeper, you might find the knowledge that is the source of the principles.

Table 2, below is an attempt to place the aforementioned principles from various authors and thought-leaders (rows) in association with the category of the “System of Profound Knowledge” (columns) where each principle seems to primarily match.

Table 2		Dr. Deming's System of Profound Knowledge				
		Appreciation For a System	Psychology	Theory of Knowledge	Knowledge About Variation	
Principles as Described by Various Authors & Thought Leaders	Toussaint & Barry	6 Flexible regimentation				
		5 Visual				
		3 Unity of purpose				
		2 Value creating	4 Respect for people who do the work	1 Attitude of continuous improvement		
	Liker (Toyota Way)	11 Respect the extended network				8 Reliable, tested technology
		7 Visual controls			14 Become a learning organization	6 Standardized tasks foundation for improvement
		3 Use pull systems				5 Culture of stopping to fix problems
		2 Continuous process flow	13 Make decisions slowly by consensus	12 Go and see for yourself		
		1 Decisions based on the long term	10 Develop people & teams	9 Grow leaders who understand & teach		4 Level out the workload
	Womack & Jones (Lean Thinking)	4 Pull				
		3 Flow				
		2 The value stream				
		1 Value				5 Perfection
	Deming (14 Points)			13 Education and self improvement		
		14 Put everyone to work on the transformation		7 Institute leadership		
		9 Break down barriers		6 Institute training		3 Cease dependence on mass inspection
		4 Move toward single supplier	12 Remove barriers to joy In work	5 Continual improvement		11 Eliminate quotas
		1 Constancy of purpose	8 Drive out fear	2 Adopt the new philosophy		10 Eliminate slogans and exhortations
	Shingo (Operational Excellence)			13 Institute and share learning		
				12 Learn continuously		11 Understand and manage variation
10 Create value for the customer						
9 Think systemically						
8 Create constancy of purpose						
4 Flow and pull value		2 Lead with humility			5 Assure quality at the source	
3 Focus on process		1 Respect every individual	6 Embrace scientific thinking		7 Seek perfection	
	Appreciation For a System	Psychology	Theory of Knowledge	Knowledge About Variation		
					Raymer & Stoecklein (Enterprise Excellence)	

What Ever Happened to “Knowledge About Variation”?

Through study of the “10 Guiding Principles” of the Shingo model, and Dr. Deming’s “System of Profound Knowledge,” the author (Stoecklein) discovered strong compatibility and alignment, however it was not readily apparent that “knowledge about variation” had been explicitly described in the Shingo guiding principles. ⁽²⁹⁾ See Figure 3 (right).



Knowledge about variation and how to manage variability is one of the core concepts that Dr. Deming introduced to the world. Without an understanding of variation, people are likely to tamper with systems and processes only making matters (outcomes) worse. The higher a person resides in an organization’s hierarchy, the broader the implications. Dr. Deming saw the most important application of knowledge of variation in the management of people, when there were no figures to observe or to plot on a chart. ⁽³⁰⁾

Some potential reasons this principle has been “lost in translation,” are as follows:

1. Toyota managers developed a deep understanding of how to handle variation over many decades. They developed systems and tools to react to variation, but those who have tried to copy Toyota may not fully understand the thinking behind the creation of these systems. For instance, Toyota and lean discussions of variation can be seen in the concepts of mura (unevenness), muri (overburden), muda (waste), and heijunka. Middle managers especially deal with mura. Heijunka (flexible and smoothed production) is a system-level response to “variation.” Toyota manufacturing and engineering people used extensive statistical process control (SPC) in the 1960’s based on teachings of Deming (at a high level, more philosophical), Juran (more detailed, techniques of QC), and Shingo (training in IE tools for plant floor supervisors). ⁽⁷⁾
2. Knowledge about variation was not fully understood (especially as it relates to the management of people), so it was not taught.
3. It was placed in a “container” (a “six-sigma thing”), separated from lean.
4. The teachers did not fully understand the knowledge behind the systems, so it was not taught (Dr. Deming might call this an example of “rule 4 of the funnel”). ⁽³¹⁾
5. The way we think (intuitive system) causes us to see patterns, which we think require our immediate action. ⁽³²⁾

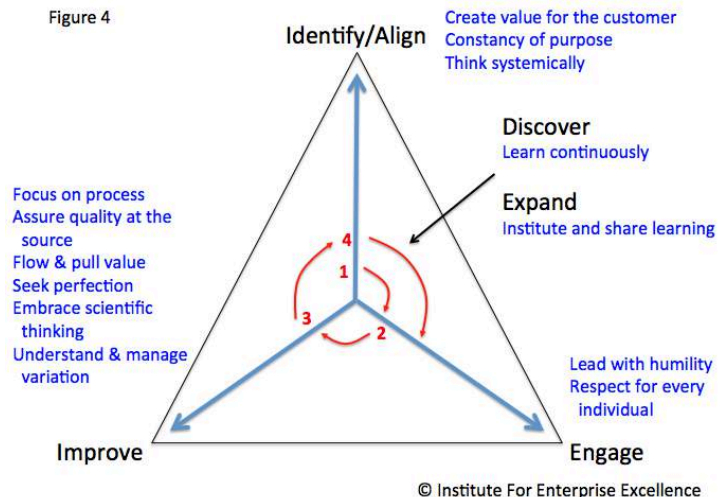
The case for including “understand and manage variation” as a guiding principle is as follows:

1. It is a universal principle. Variation exists and has always existed regardless of business or industry.
2. It is objective. Emotions do not influence this principle. There are established methods to study and react appropriately.
3. It governs consequences. Dr. Deming described the hazards of taking the incorrect action (tampering).
4. It is predictable. All processes produce variation, and when people do not understand how to distinguish between common causes and special causes of variation, they are likely to make matters worse. ⁽³⁰⁾

Enterprise Excellence:

Jacob Raymer, former Education Director at the Shingo Institute, founded the Institute for Enterprise Excellence in 2013. In addition to the four categorical elements of the Shingo model (Results, Enterprise Alignment, Continuous Process Improvement, and Cultural Enablers), Raymer identified two additional critical elements: 1.) Discover (learn continuously) and 2.) Expand (institute and share learning). ⁽²⁵⁾

One pathway for learning and applying the principles is shown in Figure 4 (right). This figure shows the 13 guiding principles (from Table 2) in the six categories.



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(1) would be in the design or redesign of systems that help identify the key performance indicators (KPI's) for the organization that matter to the customer (identify and align) as well as the key behavior indicators (KBI's). Christie Clinic leadership in the "Case Studies" section of this paper describes one example of this. Some organizations call these "true north" measures. These systems would also begin to help to align all parts of the organization toward these measures. Figure 4 illustrates that the initial steps need to be simple and meaningful, near the middle of the triangle, and then gradually expand outwardly (to more complex systems). Ideally, the organization has an even balance of the three categories (identify/align, engage, and improve). Organizations that try to create overly complex systems too soon can find their progress short-lived or stalled. The rationale for starting with strategies in the "identify and align" category is that while "engagement" and "improvement" strategies are important; they need to be directed toward the meaningful goals of the organization. Focus on "engagement" without a common goal (identify/align), or without a methodology (improvement), runs the risk of empowering people to action, but in any direction and by any method. Focus on "improvement" without a common goal (identify/align), and without engaging the workforce, can lead to the proliferation of tools and methods without any direction and separated from the engagement of the workforce. Starting here tends to create "event-based" improvement and a culture that focuses more on solving a problem rather than problem-solving.

Some examples of simple systems in Step 1 (Identify & Align) might be:

- * A "strategy A3" for the organization, not a full-blown policy deployment, but some scientific thinking regarding the true north and path to get there for the organization.
- * Visual boards at the work unit levels, a system that connects local measures to the organization's goals and objectives.
- * A communication system that describes the organization's purpose (true north measures) and how the work of each department contributes to the goals. This system might include: newsletters, meetings, and visual boards.
- * A catch ball process that translates goals up, down, and back up through the organization in order to identify the most important activities. This often means "de-selecting" activities at the top of the organization.
- * Measurement systems, including performance and behavior data, as well as targets.

How these system elements work together in a structured process to deliver a unique outcome IS the system.

Step 2 (Engagement) illustrates the design and redesign of systems that help to engage the energy and creativity of everyone in the organization. Some examples of simple systems in Step 2 might be:

- * Problem-solving teams (to help everyone in the organization to become problem identifiers and problem solvers, focused on the strategies for the organization).
- * A system of education for senior management about the guiding principles.
- * A system of education, training, and coaching for areas selected to be "model cell" areas. This would include education about principles, but also skills and methods for design and redesign of systems and processes. This might be an approach like Training Within Industry (TWI).³³⁾
- * A cross-training system for important skills.
- * A system for assessing and developing competencies.
- * Alignment of incentive systems focused on both behaviors and performance.

Step 3 is the design or redesign of systems that improve the work processes. This phase is the one that is most often associated with the tools of lean (e.g. value stream mapping, A3's, 5S, problem-solving, waste identification and removal). Some examples of simple systems in Step 3 might be:

- * Problem-solving teams (see Step 2).
- * Process mapping.
- * Standard work connected to important processes.
- * Waste identification and elimination (waste walks).
- * Idea generation systems.

Step 4 returns to the "Identify and Align" element which means the organization is now ready for more complex systems for identifying the organization's desired results and aligning those results up and down the organization. This process continues to spiral outward (and upward) as management matures in their understanding of the principles (thus the "Discover" and "Expand" elements mentioned previously).

This approach seems to be similar to observations about lean in healthcare made by John Shook, CEO of the Lean Enterprise Institute. "Three innovations we've seen in healthcare as it relates to the application of lean principles: a)

huddles, b) use of white boards, and c) checklists. These may seem simple compared to other innovations, but for healthcare it's a radical and powerful departure from previous practice.”⁽³⁴⁾

In practice, an organization's path is not always so straightforward. Many organizations begin their journey in the “tools” category (lower, left-hand side of Figure 4). While the use of tools can and does achieve results, the effort is difficult to maintain and often can become one of many “flavors of the month.” Some organizations may begin education and training programs for many people (lower, right-hand side of Figure 4). While education systems are necessary to learn the new philosophy, large-scale education efforts without immediate opportunities for practice can result in wasted efforts and a false start.⁽³⁵⁾

Case Studies – Healthcare Value Network Member Organizations (and Sponsor Member Organizations) pursuing a Principle-Driven Cultural Transformation:

Some Healthcare Value Network member organizations are using this principle-based framework to guide and accelerate their cultural transformation efforts through design and redesign of systems. The principles are founded on the new knowledge outlined by Dr. W. Edwards Deming as summarized in Table 3 below.

Table 3

<i>HVN Assessment Model Category</i>	<i>Systems Elements (tools)</i>	<i>System</i>	<i>Connection to Dr. Deming's Philosophy & Guiding Principles</i>
Identify organization priorities & align throughout the organization	Strategic A3, True North Goals, Visual Boards, Communication, Measurement	<ul style="list-style-type: none"> • Strategy Deployment 	Appreciation For a System, Constancy of Purpose, Think Systemically
Engage and involve everyone in providing value to patients	Problem-solving teams, education for management curriculum, education modules, cross-training matrix, aligned incentives	<ul style="list-style-type: none"> • Education/Training • Coaching • Leadership Development • Reward & Recognition 	Theory of Knowledge, Psychology, Institute Leadership and Training, Education and Self-Improvement, Lead with Humility, Respect for Every Individual
Continuous improvement of the work processes	Problem-solving teams, process maps, standard work sheets, waste identification and elimination, idea generation cards	<ul style="list-style-type: none"> • Problem Solving • Value Analysis • Standard Work • Idea Generation 	Appreciation for a System, Knowledge About Variation, Theory of Knowledge, Focus on Process, Embrace Scientific Thinking, Assure Quality at the Source, Flow & Pull Value, Seek Perfection
Discover (Learn Continuously) and Expand (Institute and Share Learning)	Huddles, Visual boards, Individual development plans, Horizontal value streams across departments, divisions, and companies	<ul style="list-style-type: none"> • Idea Sharing • People Development • Communication • Best Practice Sharing 	Theory of Knowledge, Appreciation For a System, Lead with Humility, Think Systemically, Focus on Process, Respect Every Individual

HVN member organizations have been introduced to the Shingo model primarily through a two-day “discovery” course where participants learn about the guiding principles and what a principle-driven cultural transformation would look like. They learn about observing behaviors, which provide clues about the systems that are in place in an organization. Through practicing to ask questions and describing the maturity level of the behaviors they see, they provide impressions of the maturity of the systems that are in place in the categories of: cultural enablers, continuous process improvement, and enterprise alignment. This education and training is one way of preparing “peer assessors” who will travel to other HVN member organizations to provide assessments and deliver feedback to the host organizations.

After exposure to education and training, participants return to their home organizations and begin to apply the use

of the model in their work. Some of this application is by individuals or small groups. In some organizations the efforts include internal assessments. Managers begin to design and redesign the purposes of various systems to achieve improved and sustained performance (results) through ideal behaviors that are grounded in the guiding principles. HVN organizations are now being exposed to the pathway shown in Figure 4, which serves as a framework for helping organizations learn and apply the principles. This is the primary work of the HVN Acceleration and Assessment Team.

Organizations that wish to obtain a current state assessment of their lean journey can receive an HVN Shingo-based assessment which is designed to accomplish three goals:

- 1) Help HVN member organizations understand where they are on their lean journey (their current reality),
- 2) Pinpoint gaps to the desired state (the ideal organization), and
- 3) Provide feedback for addressing the gaps between current reality and the desired future state, and accelerate the progress of their lean transformation.

HVN assessments are focused on education and feedback, not a score or a prize. The work to date has confirmed that focusing on scores actually drives the incorrect behaviors (the goal becomes the number, not the learning).

Some examples of the model's impact in HVN organizations is described as follows:

Akron Children's Hospital, Akron, OH – Akron Children's Hospital is utilizing strategy deployment, primarily in the form of X-matrices, down through the director level. One of the strongest systems in place is the tiered huddle system, which connects frontline staff, managers, and executive leaders in the daily improvement work. Huddles incorporate simple white boards to facilitate visual management. In addition, there has been increased familiarity throughout the organization with tools such as 5S and Standard Work instructions, as well as concepts including kaizen, waste reduction, and value-added time. Optimizing the physical space to encourage flow has led to a number of space design and redesign projects, including the design and building of a new patient tower. Some areas for future work include:

* Propagating the Shingo model and integrating it with other models currently in place (e.g., Magnet, organizational development, quality, and culture of safety).

* Furthering the philosophy of "Process Improvement Through People Development."™⁽³⁶⁾

BJC HealthCare, St. Louis, MO – BJC HealthCare is in the process of experimenting with Shingo-based internal assessments to gauge observation capabilities and test hospital acceptance. Approximately twenty Performance Improvement representatives (PI) from across the system attended the two-day Shingo assessor training offered through the HVN. Assessment teams, along with an assigned coach, were deployed to nine different hospitals or service organizations (HSO) to pilot the process. The process was introduced as an opportunity for PI representatives to practice observation techniques. Measuring behaviors has created awareness towards the success of current systems in place. For example, in one instance, an executive changed a department on-call policy during the report out. Leadership at a second facility had just completed two weeks of continuous town hall meetings. Few employees were able to articulate their personal contribution to the vision of the hospital. Lastly, every employee of a surgery area were able to articulate a common principle of "treating every room prep as if their families were the ones going to surgery." These are just three examples of how the introduction of measurable data impacted Leadership perception. Leadership responses to the Shingo Scrimmages have been unanimously positive. BJC HealthCare is taking efforts to introduce the Shingo Model to executive leadership with the intent of formalizing a deployment model.⁽³⁷⁾

Barnes Jewish Hospital (a part of BJC Healthcare) hosted the site of the first HVN scrimmage, which is an organized practice assessment for HVN members who have attended the 2-day Shingo training. The goal of this scrimmage was to evaluate the value a scrimmage to both the newly trained assessors and the assessed department. The goal of delivering value to the department with minimum interface to their daily operations was emphasized. The team felt this was especially important to make the first scrimmage a success and thus open the door for subsequent scrimmages. This goal was met as the Pharmacy department welcomed and valued the assessment and students gained experience. It's important to note though, that the experience at this point for the HVN assessors still only consisted of classroom and on practice assessment and those participating were reminded that the journey to become a seasoned HVN assessor requires much more study and experience. BJH staff members have participated with BJC Healthcare with other HVN assessments and hosted a second HVN assessment in the Central Sterile Processing Department.³⁸

BloodCenter of Wisconsin (BCW), Milwaukee, WI – BCW started on their Shingo journey in early 2012 following an introduction to the ThedaCare Business Performance System (BPS), followed up with the two-day Shingo training at the Annual Lean Healthcare Transformation Summit, and gemba visits to a more advanced practitioner, Christie Clinic (below). These learning events marked the transition from a tool-based system to a system based on the continuous improvement (CI) approach. Simultaneously, BCW’s CI team launched a partnership with the organization’s Human Resources Department to forge a sustaining link between tools, system, behaviors, and correct principles. Five key CI systems have been defined and are being deployed through training development, piloting, and organization-wide launch: True North Metrics, Strategy Deployment, Daily Problem Solving, Visual Management, and Standard Work for Leaders. Results as of mid-2013 were shared with other HVN members by hosting a gemba visit, which resulted in valuable feedback and further refinements of the systems. As of late 2013, 90% of the BCW team (820 of 900 employees) is involved in one or more CI systems, with over 2000 ideas closed and \$1.3M in full year savings.⁽³⁹⁾

Cardinal Health - Cardinal Health (an HVN Sponsor Member) uses a homegrown assessment tool, with the latest version incorporating elements of the Shingo model with criteria to assess line-driven problem-solving versus management-driven tools. The assessments now cover more than warehouse operations. For instance, a new section of the assessment focuses on the application of lean to manage inventory and to understand changes in customer or supplier behavior, as well as a section that looks at delivery processes with outsourced couriers. Cardinal Health is piloting a section that further expands the scope by applying lean to sales teams and the collaboration between sales, operations, and customer service. There are ongoing discussions at Cardinal about the next evolution of assessments, with an eye toward simplifying and moving closer to Shingo.⁽⁴⁰⁾

Christie Clinic, Champaign, IL – Christie Clinic was the first HVN member organization to explore and pursue the Shingo model as a guide for their transformation effort, and were the first to have a Shingo-based HVN assessment.⁽¹³⁾ The assessment helped them see their current state, which appeared to be heavily focused in the “tools” category (lower, right-hand corner of Figure 4). They also seemed to be pursuing overly complex alignment systems (top of Figure 4), and found that they had very little engagement from employees (front-line and management). Since the 2010 assessment, they have been designing a leadership system with a full PDSA feedback loop, including the KPI and KBI development described earlier and illustrated in Figure 5 (right). Some of their initial system “design and build” efforts were involved in co-creating front-line systems that engage the workforce in daily improvement, as well as a simpler top management results and alignment system. Their current work is to continue to build the leadership system for management and director levels of the organization.

Figure 5



Some of their reflections and lessons learned are:

- * Principles seem intuitive and make sense on the surface. With time and reflection, the true applications unveil themselves and are profound. For example, a deeper understanding of “respect every individual” has led to employee and safety systems that have resulted in less physical harm, but also less fear in the organization.
- * Co-creating systems with employees unleashes an untapped force for continual improvement. Their idea-generation system is producing approximately 1,000 implemented ideas per month.
- * Most managers think their job is to “get results,” but a deeper understanding of the guiding principles have shown that better results through ideal behaviors is the real job of management.
- * Systems drive behaviors. They realized they were starting to achieve a true cultural transformation when they observed their first “level 5” (ideal) behavior. Management learned that there were some departments that wanted to start their own daily huddles. These were initially described as “rogue” huddles. There were actually two “level 5” behaviors evident: 1) employees starting their own daily huddles to make improvements, and 2) management resisting the (traditional) urge to squelch the rogue huddles.
- * Their current system is no longer “push tool” deployment, but rather “pull tool” deployment. Simplicity will generate pull. Simplicity also helps to drive out fear at all levels of the organization.⁽⁴¹⁾

Cleveland Clinic, Cleveland, OH - The Shingo model is just starting to have an impact at the Cleveland Clinic, which is now committed to using the model, both as a roadmap and as an internal assessment tool to evaluate progress on the lean journey. Cleveland Clinic conducted the first internal assessment of the Digestive Disease Institute, which had a big impact on the Institute's leadership team. The recommendations from the internal assessment team included: strengthening the policy deployment system, implementing a robust visual management system, and further work on standardizing processes. The leadership team has used the feedback to empower teams to start implementing visual management, and they have worked at gaining greater organizational alignment around the Institute's strategic goals which had previously been shared with the leadership team, however, had not been effectively communicated to front-line staff. As a result of their efforts over the last eight months since the assessment, the Institute has seen an increase in their Employee Engagement scores, and is starting to "feel" the impact of engaged employees in the sharing and measuring of goals through a visual management system.

Thirty people have attended the two-day Shingo assessor training offered through the HVN and that has allowed for the development of a critical core of people who now have a deeper understanding of the Shingo model. The Cleveland Clinic has been careful not to position the model as a continuous improvement assessment; rather, it is an organizational assessment that pulls in the work from various efforts including: Serving Leader, Gallup Employee Engagement surveys, and the Cleveland Clinic Experience training which aligned all 43,000 Cleveland Clinic caregivers around the Mission, Vision, Guiding Principles, and expected service behaviors.

Attendees to the two-day training have included an Institute Administrator (who is now interested in having an internal assessment), several Quality Directors (who have taken the model back to their institutes and who shadowed as assessment team members on the Digestive Disease assessment and saw the value of the assessment process), a representative from the Office of Patient Experience (who was able to make the connection between employee engagement, patient experience, and enterprise alignment with Continuous Improvement systems and tools), and finally, an army of Continuous Improvement Specialists, including the entire CI Leadership team (Executive Director, Medical Director, and Administrative Directors). Cleveland Clinic has included the Shingo assessment process in the CI Strategic plans for next year and intend on conducting internal assessments in at least eight Institutes and/or regional hospitals next year. The Cleveland Clinic is currently scoping internal assessments for three different areas that are seeking to obtain feedback and recommendations to include in their Strategic plans for next year.⁽⁴²⁾

Health East, Care System, St. Paul, MN – Health East is testing an internal Shingo-based assessment process of their frontline management system. The process includes a 15-minute gemba walk preparation, a 45-minute interview in the work area, followed by a 30-minute team consensus regarding the maturity level of the systems they observe. The assessment team provides a five-minute report-out to the leader of the area highlighting two strengths and two opportunities for improvement per dimension. The Health East leadership uses the assessment reports and suggested improvement opportunities to strategically plan their journey toward operational excellence. Initial tests of the method have produced these lessons:

- * Define very clearly the ideal behaviors to be assessed. Novices assessed the behaviors they observed which, of course, translated into very high scores.
- * Limit to three to five behaviors per dimension and have all assessing teams assessing against the four dimensions. The initial approach of one or two dimensions per team did not result in rich discussion when it was time to regroup as a team.
- * Provide enough awareness and training prior the assessment. The assessors did not feel prepared enough.

Some examples of the findings from the initial test of the assessment method are:

- * The current annual run rate of implemented improvement ideas is 27,000.
- * PDCA is not developed enough at the front line.
- * Leaders are looking more at the visual boards than at the process.
- * Leaders could make better personal connection with staff during their gemba walks.⁽⁴³⁾

Lehigh Valley Health Network, Allentown, PA – Lehigh Valley Health Network (LVHN) has recognized the need to couple improvement systems with cultural change by creating an Organizational Effectiveness (OE) function comprised of lean coaches and organizational development consultants. The OE department developed an internal Shingo-based assessment that incorporated Lehigh Valley Health Network (LVHN) language and metrics. The OE department first assessed themselves. Lessons learned from that initial assessment aided in understanding

opportunities within OE, and how they provide service to key internal customers: clinical and operational units. Experiencing the assessment also surfaced concerns with the assessment, which helped in the refinement of the assessment tools and process before application to other departments. The LVHN internal assessment teams are comprised of Lean Coaches and Organizational Development Consultants. This marriage of deep expertise in both culture and process is a hallmark of LVHN’s transformation support. Each subsequent assessment has been designed to provide insight to the leadership for the area reviewed as well as the tools and systems for continuous improvement. In addition, each assessment was considered a PDCA and provided further enhancements to the assessment. The Departments assessed have included the emergency department, perioperative services, oncology, outpatient clinics, and specialty practices ^(44,45)

Martin Health System, Stuart, FL – Martin Health System’s Performance Excellence program has used the Shingo Model in two distinct ways, as a framework for the design and transformation of their management system and as an assessment tool at the department level to understand the cultural current state. Using the Principles and Supporting Concepts as a guide, Martin Health has worked to transform their management system to one that will support a culture of continuous improvement. They have developed systems for leadership and front line development, succession planning, and leadership rounding on the people side. On the process side, Martin Health has adopted PDCA as their problem solving methodology, implemented daily huddles organization wide to engage everyone in problem solving, and incorporated standard work for front line Associates and leaders. They are now implementing a strategy deployment system to assure all of the improvement work is aligned with the organization’s strategic objectives. Martin has also developed a system for internal department level Shingo assessments. The ACT (Associates Committed to Transformation) Team, made up of front line associates, has developed a process for assessing a department’s current culture as it relates to Performance Excellence. The Performance Excellence team then partners with the leadership and develops the cultural action plan, focusing on system development and utilization to drive ideal behaviors. ⁽⁴⁶⁾

MemorialCare Health System, Fountain Valley, CA – MemorialCare has incorporated the Shingo model into their management system assessment process. Lean Fellows and members of the Advanced Team Leaders have had some initial training in the assessment methodology. This will prepare them to redesign their system for reviewing key business areas at each MemorialCare campus. The performance management system is being adjusted to include attributes of behavior as well as performance results. ⁽⁴⁷⁾

Mercy, St. Louis, MO – Mercy began their lean journey as many organizations do by assigning knowledgeable lean facilitators to focus on targeted projects through improvement events. As they have been exposed to the Shingo model, they have adjusted their approach to focus on the creation of leader standard work systems led by the senior management at each Mercy ministry campus. The four primary components of the system are shown in Figure 6 (right). This system is producing the desirable “ideal” management behaviors as well as improved alignment and results. ⁽⁴⁸⁾

Figure 6



Parkview Health, Fort Wayne, IN - Parkview was one of the early HVN members to participate in a Shingo Assessment. Parkview was intrigued by the model, and hoped it could assist in accelerating their lean journey by teaching management about principles, systems, tools, and how they drive desired behaviors. The Parkview Continuous Performance Improvement Team prepared a self-assessment document that was used by a group of peer HVN assessors. Parkview hosted the HVN Assessment in November 2011. The assessment feedback was shared with only the senior leadership team at that time.

In January, 2012 the entire Continuous Performance Improvement team was able to complete Shingo Assessor training. The goal is to eventually incorporate it into the team’s model for assessing behaviors and culture at Parkview. The original plan was that it would be another year before the CPI team would be able to do this. However, as they began development of their business model for 2014, they felt it was a necessity. Parkview is currently in the process of designing standard work to include a stakeholder assessment, which includes a “Shingo” behavior/culture assessment. A steering team will assess areas (using the model) for their

behavioral/cultural readiness, prior to a joint commitment to work with the team. Any area not culturally “ready” (meeting a minimum level on the assessment) will work with the Organizational Development team on additional leadership development skills. ⁽⁴⁹⁾

St. Boniface Hospital, Winnipeg, Manitoba – St. Boniface Hospital has recently committed more deeply to using the Shingo model. In September 2013, thirty individuals attended a two-day workshop which included the entire Executive Team, Directors, and Transformation Core Team. This event included focused internal observations using the model. The organization’s leadership has subsequently committed to using the model, and using the principles to describe ideal behaviors, select and build systems to drive these behaviors, and to build a longer-term road map to guide the work. There will be a follow-up workshop in January 2014, which will again include the hospital leadership team, and transformation team to continue this work. ⁽⁵⁰⁾

St. Mary’s General Hospital, Kitchener, Ontario – St. Mary’s General Hospital is implementing a lean management system that is modeled after ThedaCare’s Business Performance System (BPS). One example of how the system is driving ideal behaviors is shown in Figure 7 (right), which shows the hospital president using a checklist to indicate he has completed some of the tasks of his daily standard work, which includes attending one of the daily staff huddles. ⁽⁵¹⁾

Figure 7



St. Rita’s Health Partners, Lima, OH – St. Rita’s has designed a Lean Management Model and have begun to deploy it at the facility. The model is awaiting final executive approval at the Catholic Health Partners corporate level at this time. One person has been trained in the HVN Shingo-based model, with the long-term intent to train many more if approved. St. Rita’s executive team supports using the this model as the cultural enabling platform to create a Lean Management System. ⁵²

Conclusion: Some healthcare organizations maintain Dr. Deming’s philosophy as part of what they do and have established quality departments that use the PDSA cycle for improvement. However, these actions alone will not address the prevailing style of management in healthcare, which is the same style described of Western management by Dr. Deming. Healthcare organizations need not continue to be managed in this manner. The new knowledge that Dr. Deming introduced to the world is being re-introduced to some healthcare organizations that are serious about providing better value to patients and at an affordable cost. These healthcare organizations are learning about a model for better management from companies like Toyota that developed better results through ideal behaviors in what has been described as “lean”. What companies like Toyota have done is to actualize the principles which, minus the lean methods and systems, tend to remain abstract principles – powerful, but conceptual. ⁽⁷⁾

Many organizations learn about lean tools and methods, and see this as another approach to drive costs out of the organization. While the tools and “event based” approach can and does yield results, it cannot be sustained without a cultural change that comes from management. Dr. Deming described this as the “transformation of management.” Models like the Shingo model for Operational Excellence can and do provide guidance to organizations that wish to pursue a principle-based cultural transformation, and avoid the pit-falls of a tool, or event-based approach.

One member of the HVN Assessment and Acceleration Team shares these four lessons learned and conclusions:

1. Get started. The efforts of improved problem-solving management activities prove to be beneficial with little negative effects. It can be done, it has been done, and you can do it too.
2. There is no need to re-invent the wheel. There are excellent examples of success stories with correlated management actions including designing systems that assist problem-solving efforts.
3. Variation is a reality – do not ignore it.
4. This work takes time and effort. There is no short cut to sustainable improvement. ⁽⁵³⁾

This sounds like advice from Dr. Deming. “There is no substitute for knowledge.”⁽⁵⁴⁾

Notes:

- ¹ Out of the Crisis, W. Edwards Deming, The MIT Press, 1986, in particular Chapters 2, 3 and 13.
- ² The New Economics, W. Edwards Deming, The MIT Press, 1993, in particular Chapter 2.
- ³ Out of the Crisis, Chapter 18 (Appendix), Transformation in Japan
- ⁴ The World of W. Edwards Deming, Cecelia S. Kilian, 2nd Edition, SPC Press, 1992, pp. 1-85, 179-248.
- ⁵ The Birth of Lean, Koichi Shimokawa and Takahiro Fujimoto, Editors, Lean Enterprise Institute, 2009, pp. 16, 177, 179, 202, 208, 211-212, 223.
- ⁶ www.juse.or.jp/e/deming/
- ⁷ John Y. Shook, CEO Lean Enterprise Institute, personal correspondence, January 2014.
- ⁸ Union of Japanese Scientists and Engineers was established in May 1946 and authorized as the foundation of a juridical body by the Science and Technology Agency of the Japanese Government.
- ⁹ <http://blog.deming.org/2013/07/deming-and-lean-the-disparities-and-similarities/>
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- ¹² On the Mend, Toussaint, John S., MD and Gerard, Roger, PhD., Lean Enterprise Institute, 2010.
- ¹³ Transforming Healthcare, Charles Kenney, Productivity Press, 2011.
- ¹⁴ Leading The Lean Healthcare Journey, Joan Wellman, Patrick Hagan, Howard Jeffries, MD, Productivity Press, 2011.
- ¹⁵ The three interdependent components are: 1) Transparency of healthcare performance, 2) Care delivery with less waste and fewer errors, and 3) Payment systems that reward patient value creation, www.createvalue.org/what-we-do/mission-value/
- ¹⁶ The Healthcare Value Network traces its origin to a meeting in 2008 convened in collaboration with the Lean Enterprise Institute and the ThedaCare Center For Healthcare Value. John Y. Shook, personal correspondence, January 2014.
- ¹⁷ www.shingo.org
- ¹⁸ http://createvalue.stellarbluewebdesign.com/wp-content/uploads/2013/11/Assessment_HVN_December2011.pdf
- ¹⁹ Quality, Productivity, and Competitive Position, W. Edwards Deming, Massachusetts Institute of Technology, Center for Advanced Engineering Study, 1982, pp. 16-55.
- ²⁰ Out of the Crisis, Deming, Chapter 2.
- ²¹ Lean Thinking, James P. Womack, Daniel T. Jones, Free Press, 1996, pp. 15-98.
- ²² The Toyota Way, Jeffrey K. Liker, McGraw-Hill, 2004.

²³ The Promise of Lean in Health Care, John S. Toussaint, MD, Leonard L. Berry, PhD, Mayo Clinic Proceedings, January 2013, Mayo Foundation for Medical Education and Research.

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²⁷ “Transitioning to the Knowledge Age”, Barbara Lawton, PhD., Ninth Annual Hunter Conference, May 1996.

²⁸ “Quality Improvement Systems, Theories and Tools”, Michael Stoecklein, The Healthcare Quality Handbook, Chapter 4, Health Administration Press, 2005.

²⁹ “What Ever Happened To ‘Understanding Variation’?”, Michael Stoecklein, Society for Health Systems Engineers Annual Conference, February 2013.

³⁰ The New Economics, Deming, Chapters 4, 6, 7-10.

³¹ The New Economics, Deming, Chapter 10.

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