The Missing Pieces in the Lean Enterprise Model (Revised)

A Monograph

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Introduction

Several years ago, we undertook a project to document the Lean Enterprise approach to commerce and provide additional tools to enable its successful use. Both authors had studied and applied Lean thinking for more than two decades. We each had observed and measured its effects. *When implemented with the aim of benefiting all stakeholders inclusively*, Lean thinking increases the value received by customers, reduces operating costs, and provides employees the opportunity to experience pride in the products they produce and the services they deliver. It also yields new learning, improved employee engagement, elevated teamwork, and has raised the performance of businesses on traditional measures of business success.

As we proceeded with our project, however, we uncovered problems in documenting what we understood to be the Lean Enterprise approach to commerce. Addressing these problems caused us to elaborate and extrapolate what is termed "Lean thinking" to the point that we could no longer say that what we were describing was "*the Lean model*." These problems included:

- confusion among Lean practitioners about the meaning of Lean Enterprise,
- gaps in the development of Lean Enterprise as a commercial model,
- absence of foundational knowledge[1] that explains the intellectual basis for Lean thinking, and
- failure to recognize Deming, not Toyota, as its origin and the proper inclusion of his thinking in its teachings.

This paper shares the results of our efforts and describes the gaps in Lean thinking we uncovered. We see it as a first step in problem solving ways to improve the Lean Enterprise model and its use by Lean community members. Since no one person controls the content and interpretation of the Lean model, the solving of these issues will require consensus across the Lean community.

Confusion About the Meaning and Purpose of Lean Enterprise

We, and others in the lean community, consider the name, "Lean," to be misleading. Yes, the application of "Lean thinking" (Womack and Jones, 2003; Womack, Jones, and Roos, 1991) does streamline work and workplaces and results in less use of resources, but that is the least of what it achieves. Exhibit 1, beginning on the next page, explains two possible origins of the name we uncovered. One possible source of the name appears to be due to an error in the translation of a statement by Taiichi Ohno, a person presumed by the Lean community to be a primary source for Lean thinking. Another source for the name, "Lean," is John Krafcik, a member of the Massachusetts Institute of Technology research team that studied the question of why Japanese manufacturing was superior to manufacturing done elsewhere in the world. It reflects his amazement at what was, at the time, a startling discovery—namely, that one can actually produce quality products, tailored to customer needs, and in relatively small quantities with strikingly fewer resources.

[1] Foundational knowledge refers to the set of concepts, principles, and relations used to explain the "why" underlying observed facts or the set of assumptions from which the judgments and directives of a deductive knowledge systems are deduced.

Exhibit 1. Why the Name "Lean" Is Misleading

It is the name of the Lean approach to commerce that everyone first encounters. For many, it is only the name that is known. Therefore, it is a fair question to ask, "How effectively does the name 'Lean' describe the essence of its approach to commerce?" Our analysis of the name "Lean" concludes that it is, at best, unhelpful in clarifying the fundamental thrust of the Lean model and the scope of its concerns. It suggests an approach riveted on pursuing efficiency in business operations rather than one riveted on maximizing the delivery of value to customers and all stakeholders.

Through our research, we uncovered two roots for the origin of the name "Lean." The first and most referenced origin is the book, "*The Machine That Changed the World*" (Womack, Jones, and Roos, 1991). The second is the English translation of Taiichi Ohno's *Workplace Management* (Ohno, 2013). Ohno is considered by Lean community members to either be the originator of Lean Enterprise or a major contributor to it. Neither source captures the scope of what Lean Enterprise signifies. Indeed, the second source is based on an error in translation.

The Machine That Changed the World

Womack, Jones, and Roos (1991) introduced the term "Lean" to refer to the approach to production used by Japanese auto manufacturers. That approach contrasted with "mass production" and enabled the efficient production of tailored products in small volumes. Greater profit could be realized by enabling a company to respond to the varying wants and needs of different customer segments. They credited the term to John Krafcik, their research associate (1991, page 13). He used the word "lean" to represent that the Japanese approach "used less of everything compared with mass production—half the human effort ..., half the manufacturing space ..., half the investment in tools, half the engineering hours to develop a new product" (ibid).

What can we take from this reference? If we were to infer what a Lean enterprise was about *just* from this description, we might conclude that it is an approach to production that enables a manufacturing company to operate with a very high level of efficiency and least cost footprint while allowing it to respond to variations in the wants of different customer segments. We might further conclude that (1) Lean thinking focuses on operations and (2) its purpose is to make your business's production operations flexible, efficient, and least costly. Based on this conclusion, we might reason that Lean's ultimate end is to provide a producer the capability to sell more products, at better margins to maximize producer profitability.

What do you think? Is that the ultimate goal that drives the Lean approach to commerce? If you listen to Art Byrne, the person recognized to have transformed the Wiremold company from the traditional approach to commerce to the Lean approach, you would answer, "No." He said, "To me ... the thing that is most misunderstood about Lean is the fact that Lean is a strategic thing ... . To be successful you have to see Lean as your underlying core strategy. Removing waste and improving your value-adding activities, *in order to deliver more value to your customers* [italics added], is what Lean is all about" (Meyer, 2012). In other words, benefiting your customer is its *strategic* purpose, not maximizing company profits. Similarly, we believe that once you include in your thinking *all* the ideas that Womack and his associates present in their various works, you must also conclude that the essence of Lean is more than the realization of efficiency, cost reduction, and profit maximization for the producer.

Workplace Management

There is actually an earlier reference than Womack et al (1991) for the use of the word "lean." It is in the English translation of Taiichi Ohno's book, *Workplace Management*, first published in 1982. This use, an artifact of translation, appears to misrepresent the point Ohno was making. In Chapter 2, Ohno uses the Japanese word *genryou* to refer to companies that have apparently succeeded by streamlining their operations—hence, the choice of the English word "lean" (Ohno, 2013, pages 29-30). By becoming 'leaner,' they became more efficient and, by their reckoning, more successful. However, Ohno introduces this more common meaning of *genryou* only as a prelude to using the word *differently* to describe *his* perspective. He alters the first character in the two character ideograph representing the word *genryou* from one meaning "reduce" to another meaning "limited" (Ohno, 2013, Footnote 9, page

Continued

Exhibit 1. Why the Name "Lean" Is Misleading (continued)

29). By this "wordplay," he intends to change the term's meaning from "reducing weight" (literally; or becoming 'leaner' figuratively) to "limited volume" or "limited production." Importantly, "limited volume" or "limited production" *does not* mean "small volume."

In fact, the quantity of a product produced, in itself, has no significance for Ohno. Rather, as Ohno explains. What is important is producing *only what sells in the quantity that satisfies demand*. "From the standpoint that we only make what will sell and we do not make what will not sell, it becomes very important for limited volume production to be production at a low cost" (2013, page 31). Be careful with how you parse this statement. He is not saying that limited volume production must be at low cost and therefore, low cost is what is fundamentally important. Rather, he is saying that *producing only what sells in the quantity that matches demand* is the only way to realize lowest cost production. As he goes on to explain, there may be efficiencies in operations one can realize either through streamlining or, paradoxically, by producing large volumes. These may reduce cost from an accounting perspective, either in terms of total cost of production or unit cost. However, if what you produce sits unsold in inventory—none of these efficiencies are beneficial.

As you read Ohno's statements carefully, it becomes clear that he is essentially making the point W. Edwards Deming made to the heads of Japanese companies in 1950. In his first lecture to them, Deming stated, "Every month you must make ... the right amount of product, or you cannot achieve economical production" (Deming 1950a). Ohno's meaning is also similar to Deming's statements about pursuing cost reduction or efficiency. Deming said that if you pursue cost reduction, you may well reduce cost but you may also destroy your business. Neither cost reduction nor efficiency is a proper focus for commerce. Ohno states "reduced weight" or pursuing 'leanness' may just as well eliminate *muscle as fat*. Essentially, pursuing cost reduction or 'leanness' is wrongheaded and can be dangerous. Thus, Ohno's meaning by using his altered version of the word *genryou* is not cost reduction through streamlining but 'smart' production—*producing only what sells in the quality that is required*. If all that is produced is sold, all resource consumption generates value. Both Deming and Ohno assign a controlling notion that every business person should use to guide decision making so that they avoid the pitfall of pursuing 'leanness' per se. For Deming, the central focus should be on quality—which, for him, meant producing outputs that benefit customers and that customers will want to buy. The secondary control is producing a volume that matches demand. For Ohno, the controlling notion is more akin to the concept of "pull"[1] but, by necessity, incorporates both aspects of Deming's notion of quality since there can be no "pull" for products people do not value and will not pay for. For pull to lead to business success, one must produce the *right product*, *when it is needed*, and *only in the amount needed*. For both men, pursuing 'leanness' per se is at best irrelevant and at worst destructive to business success.

[1] Pull means that customer demand triggers the flow of activity that transforms resource inputs into a finished product (i.e., value-adding activities).

In researching the origins of the name lean, we uncovered another, more serious problem that challenged our understanding of what Lean really means. We discovered that there are, in fact, inconsistencies among Lean community members about the ultimate aim the Lean approach to commerce serves. That judgment is not *just* based on our analysis of the Lean literature. Indeed, the fact that Lean community members are confused about the ultimate purpose their approach seeks to realize is apparent to all who participate in or are observers of various Lean community online forums. Witness, for example, the different answers members produce to the basic question of "What Is Lean?" (See Exhibit 2, next page). Members appear to anchor their responses in their personal experiences, training, and readings. And, while not agreeing with each other, everyone with an answer speaks with confidence.

Exhibit 2. Sample of Definitions of Lean Offered in One Online Lean Community Forum

1. "Lean is providing value to your customers while eliminating waste as much as possible. Value means providing the product the customer wants, at the quality they want it, and only when they want it."
2. "Lean is about profitable growth - it's as simple as that."
3. "Lean is minimum inventory and minimum rework in a manufacturing industry. Extrapolating the concept to other industries, it would entail using capital in the most efficient manner in order to produce the same result or, to increase output."
4. "[Lean] is a philosophy for business that means reduce waste to improve the profit for company."
5. "I believe Lean is one of the most powerful continuous improvement strategies in the world. It brings out the best in workers and managers by getting them to collaborate more and focus on the needs of the customer. The methodology challenges people to always improve and go way beyond their comfort zone."
6. "Lean is simply a set of tools used to execute Process Improvement."
7. "Lean is about cultures, mindsets, and behaviors. The tools and jargon are incidental to an organizational culture that continually strives to improve, eradicates waste as a matter of habit, and has a disciplined process-focused management team that values its direct contributors. Techniques are temporary; principals [sic] are permanent."
8. "[Lean] is about reducing the use of any and all resources, that could be put to profitable use, including space."
9. "Lean is a mindset. It is a philosophy that strategically and continuously reviews waste in the organization and empowers teams to remove it. A byproduct of Lean is, without doubt, improved profitability as all waste generates a cost. You are kidding yourself if you feel the business will not expect [cost savings] as its ROI and [compensation for the] risk of challenging the status quo. Generally speaking you cannot embark on this journey without an understanding that there will be [worker] displacement; wasteful processes require additional resources and, by its very nature, a Lean organization cannot – NO, will not - allow that."
10. "Waste removal/reduction is something you get from implementing Lean; not the purpose of Lean. The purpose of Lean is to give the customer what they want, when/where they want it, with the minimum consumption of resources along the way."
11. "[Lean] is a strategy for linking, aligning, and coordinating our activities to give our customers what they want, when they want it, at a competitive price."
12. "I don't think that the focus of Lean is the removal of waste as many people believe it to be. Lean is about making what the customer wants flow."
13. "In my opinion, Lean is none other than waste killing."
14. "Lean is a positive change in culture and methods that improves the organization's processes as well increases customer satisfaction."
15. "Lean/CI and most of its associated tools are designed to do three basic things. 1) Reduce/remove non-value adding activities (reduce waste). 2) Build quality into the whole process. 3) Make the product or service flow."
16. "I don't think there is a definition of Lean. Lean is now an 'umbrella term' that means all sorts of things to all sorts of people depending on their frames of reference. Earlier I made this point that there is no definitive definition of Lean and this thread confirms that. The reason is that Lean is essentially descriptive. It attempts to describe the management and production systems at Toyota in Japan and our understanding of that is changing over time. As Joe [another participant] put it: 'It seems that people are taking different ideas and combining them together to redefine Lean.'"

In every online discussion about the meaning of Lean Enterprise we observed, at least a third of the answers asserted that Lean is all about "efficiency and cost reduction" with the intent of maximizing profitability for the company. For these community members, the name "Lean" is a good fit. While respondents proposing this 'efficiency and cost reduction' interpretation rarely cite sources for their assertions, they could. For example, despite Ohno's assertion in his work *Workplace Management* (Ohno, 2013) that efficiency *in itself* is destructive, he makes the following seemingly paradoxical statements in his book, *The Toyota Production System* (Ohno, 1988).

> "The most important objective of the Toyota system has been to increase production efficiency by consistently and thoroughly eliminating waste" (Ohno, 1988, page xiii). And, later he adds, "In the Toyota production system, we think of economy in terms of *manpower reduction and cost reduction* [italics added]. The relationship between these two elements is clearer if we consider a manpower reduction policy as a means of cost reduction, *the most critical condition for a business's success*" [italics added] and "... all considerations and improvement ideas, when boiled down, must be tied to cost reduction. *Saying this in reverse, the criterion of all decisions is whether cost reduction can be achieved* [italics added]" (Ohno, 1988, page 53).

Be clear, we *do not* propose that this excerpt, on its own, presents a correct understanding of Ohno's perspective. Nonetheless, *on its face*, it does strongly support the assertions of the 'efficiency and cost reduction' camp.

A second portion of respondents define Lean from a continuous improvement perspective. They see Lean as focusing on the application of tools (e.g., 6S, Kaizen, TPM) to eliminate all non-productive work from work processes and to elevate the utility of workplaces. Ohno is also the touchstone for their thinking, perhaps especially his book, *Workplace Management* (Ohno, 2013). In that work he emphasizes continuous improvement. He exhorts everyone to challenge the current state of work processes and imagine still better processes. He wants everyone to understand that the term, *gemba,*[2] applies not just to production areas but to administrative areas as well.

Still another cluster of respondents view Lean Enterprise from an executive perspective. Their minds are anchored on the extended value stream and see Lean Enterprise as a cooperative strategy integrating the contributions of all participants to commerce. They also see it as a different approach to leading and involving people, one that recognizes the knowledge and creativity of workers. The Lean approach emphasizes the importance of engaging people's minds. It develops people's knowledge and skills and provides them opportunities to contribute to improving the business and share in the benefits they generate. These community members define Lean's purpose as maximizing the delivery of value to customers as judged from the customers' perspective. This maximizing of customer value, however, must be accomplished in a way that *benefits all stakeholders* in commerce *inclusively*. Proponents of this perspective sometimes emphasize waste removal as the singular means to this end. For example, Womack (2016) states "The objective [of

[2] The term *gemba* means "where the real work is done." It refers to the front-line workplaces where the product or service offering of a business or a business function are actually produced.

Lean] must be to produce a better result for the customer, better work experience for employees, and better performance for the organization, all by removing waste." At other times, Womack and others also discuss the importance of affirmatively adding of value to offerings and services and not just eliminating waste. For example, Jones (2016) states, "At its core, Lean is a customer-focused strategy to develop better products, which are created and delivered by much better product development and production processes."

Authors assuming the executive perspective see Lean as a comprehensive and strategic approach to conducting a commercial enterprise that seeks to create value for communities, governments, and society as a whole (for example, see Emiliani, 2004). This strategic perspective also emphasizes the importance of competing through the excellence of one's offerings and of engaging the extended value stream[3] in applying Lean thinking. Regarding executive functions, they discuss the need to change the role of managers from overseers and controllers to enablers of employee success and to adjust human resource management systems to comply with the Lean perspective (for example, see Liker and Hoseus, 2008). They also assert the need for all business activities—ranging from the board room and executive suite through the management, supervisory, and front-line tiers in and across every business function—to work together as a team in the continuous pursuit of maximizing the delivery of value to customers in ways that benefit all stakeholders inclusively.

While you might respond that none of these different perspectives are necessarily mutually exclusive—that comment leaves unanswered the central question: "Which of these notions or what higher order notion represents the *controlling aim* of the Lean approach to commerce?" Minimization of cost? Maximization of profit? Delivering value to customers? Benefiting all stakeholders inclusively? What should constrain the pursuit of one or another of these ends when trade-offs are required? How does a Lean community member systematically resolve conflicts between the different ends businesses pursue without a definitive understanding of the controlling aim Lean pursues?

The legitimacy of our confusion about the goal of Lean Enterprise was reinforced by the findings of a survey implemented by Womack in 2010 (Womack, 2010). He asked community members at large to identify what the major barriers to propagating Lean's application were. To his "surprise"—but not ours— Womack discovered that "Many of you [Lean practitioners] identified confusion about the meaning of Lean as a barrier to progress in your organization [sic]" (Womack, 2010a).

The Implications of Uncertainty About Lean's Ultimate Aim

The significance of this definitional problem seems poorly grasped by the leaders of the Lean community. A set of ideas coheres into a system *only* when they are organized around a specific aim. The aim of each system determines the relevance of each component within it and the role it

[3] An extended value stream represents the flow of input resources from suppliers to and through a business's production system and from the business's production system to the customer of its output. Each of the organizations who contribute to that flow, whether internal or external to the business, is represented in it.

performs. It defines the relationships among elements and regulates how they interoperate to achieve the system's aim. The necessity for a definitive statement of a system's aim applies to every system whether human or mechanical (Barnard, 1968; Deming, 2000). Thus, the purpose of Lean Enterprise, the ultimate end that its approach to commerce is to serve, determines the validity and meaning of all other assertions one may make about it. Hence, if the end the lean approach to commerce pursues has no singular definition, there cannot been a definitive understanding of what constitutes a lean enterprise. Its absence renders Lean thinking a mere collection of ideas with no way to detect which ideas truly belong in its ensemble of thought or which applications are proper to its purposes.

This definitional issue, therefore, is a fundamental problem for the Lean community and any serious researcher. No science about any conceptual system is possible if one cannot define its boundaries and establish what is and is not part of it. To realize this end, a single, common, operational, and stable definition of the conceptual system's function is essential. Absent a definitive statement of the model's function that is endorsed community wide, "Lean thinking" becomes a euphemism for a set of tools and activities pursued by different people, in different ways, for different purposes.

The Question of What Constitutes a Lean Enterprise

The significance of definitional problem concerning what the aim of the lean approach to commerce is renders unknowable what constitutes a lean enterprise. Given the controlling function of a system's aim in defining its components and processes, the absence of a singular definition of lean's aim means that there cannot be a definitive description of what constitutes a Lean Enterprise. The factual basis that supports this logical conclusion became exposed with regard to the Delphi Corporation's bankruptcy in 2005, a company that had won "many Shingo Prizes for lean manufacturing excellence" (Waddell, 2005). Following its bankruptcy, there was much disagreement about whether Delphi had been truly a "Lean Enterprise ." Indeed, Waddell lists many factual features of that company's conduct and management that he and others considered not Lean (Meyers and Waddell, 2005). Waddell stated that "The lesson is that looking lean is not the same as being lean" (2005). Yet, in the same article he reports that James Womack himself declared that Delphi was indeed a Lean Enterprise.

Other Gaps in Lean Thinking

Tools support people in accomplishing tasks. No matter how carefully designed a tool might be, its actual use is determined by the judgments its user makes. These judgments decide the task the tool will be used to accomplish and whether and how it should be used in a given situation.

In a commercial context, the judgments that guide task performance are steered by the goals and principles embedded in the commercial model an organization chooses to implement. The knowledge detailed in that model of commerce, as understood by the tool user, *provides the only*

intellectual control on the purpose for which a commercial tool is put and the manner in which it is used. Thus, for example, if my commercial model is based on the singular pursuit of the producer's self-interest as expressed in maximizing the producer's profit—I will apply tools to uses in ways that realize that end. If my commercial model's purpose is to maximize the delivery of value to the business's customers in ways that benefit all stakeholders inclusively, I will make other choices.

We understood this requirement. Therefore, given that we wanted to add some tools to the Lean tool kit, we drafted a summary of the Lean model organized around the aim *we* thought defined the purpose Lean commerce pursued. We populated this summary with the contents of Lean thinking *consistent with that aim*. Our initial summary of the model captured what we perceived to be the Lean Enterprise approach as described in existing Lean literature, *albeit culled to align it to the aim we imagined Lean Enterprise to have*. We used this summary to guide our tool building and to construct the principles that should control each tool's use. Our premise was that the Lean literature would provide us with any additional content we needed to complete our work.

The first shock to our thinking was the discovery of uncertainty about the aim Lean Enterprise pursues described above. We encountered more shocks the deeper we proceeded into building the new tools. As we encountered issues that a tool user would have to resolve, we derived a solution for the tool user from *our understanding* of Lean Enterprise. When we sought to verify our thinking, we could not uncover within Lean literature a commonly accepted principle upon which to rest our thinking. The more we proceeded, the clearer it became that Lean literature did not address all the issues we encountered in guiding people in the proper use of the tools we were building. We uncovered a number of different gaps the most significant of which we grouped into the following categories:

- lack of knowledge to guide one in discriminating the end and controlling values that should determine the application of Lean tools in specific, but common, circumstances;
- lack of knowledge to guide one in determining how certain executive functions should be implemented (e.g., structuring an organization, understanding what market strategies are acceptable, how a business should deal with externalities, etc.); and
- lack of knowledge that explained the "why" behind Lean management rubrics.

By "definitive knowledge," we mean a set of principles expressed, defined, endorsed, and applied consistently across the community of people who represent a particular system of thought—in our case, the Lean community.

Ends Served and Controlling Values for Tool Applications

Certainly everyone in the Lean community will agree that Lean is about driving waste out of processes. But, we could not find agreement across the Lean literature about how the benefits of waste removal should be shared or applied. Should they be disbursed to owners or shareholders

as the popularly endorsed aim of a Capitalist enterprise would seem to suggest (Bainbridge, 2012; Friedman, 1970)? Should some of it be put at risk and applied to discovering better ways to meet customer needs? If so, how does one assess the amount of profit to apply? Should the increased margin produced by reduced cost to current price be shared with employees, returned to customers, or both? Who decides such issues and what guidance does one use to answer these questions?

As another example, can one properly apply Lean tools to downsizing a company. If you say "Yes," then how do you address the negative effects on worker participation in continuous improvement activities when people realize they are assisting in ending their jobs? Would we not be endorsing the view of people who see the true meaning of the term 'Lean' as, **"L**ess **E**mployees **A**re **N**eeded"? How do you resolve the application of Lean tools to downsizing with Womack's assertion that, "those of us in the Lean Community have always said that we won't work with enterprises that use Lean knowledge to eliminate jobs" (Womack, 2016).

If you say "No," do not use Lean tools to downsize, then how do you resolve your position with Ohno's assertion that "we consider a manpower reduction policy as a means of cost reduction, the most critical condition for a business's success" (Ohno, 1988, page 53).[4]

Similarly, what about the use of Lean tools to drive cost reduction *solely* for the purposes of improving the company's profits? Is that consistent with the purpose of maximizing the delivery of value to customers or the notion of generating benefits for all inclusively? In our experience as management consultants, owner profit alone certainly has been the most common end that cost reduction has served and the main interest business's have had in applying Lean thinking. And, as you recall, perhaps a third of all Lean community members agree with this use. But, if you accept Emiliani 's position (Emiliani, 2004, 2011), you will not. He decries what he sees as the dominant business thinking which, he terms, "zero-sum thinking." By that calculus, one stakeholder can only improve his or her wins at the cost of other stakeholders. Owners maximize their profits by keeping them and that extracts resources from the enterprise. It benefits themselves singularly, not all stakeholders inclusively.

The above are just a sample of the decisions one faces in "properly" applying Lean tools. And, in our research of a wide number of such decisions, Lean thinking lacks a consistent and authoritative set of knowledge to guide one in choosing the right course of action.

Executive Functions Guidance

Executive functions are those activities that ensure an enterprise maintains itself as a whole and viable enterprise capable of accomplishing its purpose (Barnard, 1968). They include activities such as defining a company's business intent, designing the organization, setting yearly goals, developing plans, solving organizational problems, and improving organizational performance. They also include the activities that ensure the presence, engagement, and effective contribution of each person needed to accomplish the business's aim. Finally, they ensure the integration of

[4] Again, this Ohno statement seems at odds with his statement in *Workplace Management* (Ohno, 2013) that efficiency *in itself* is destructive. Nevertheless, he stated it and it seems unequivocal.

efforts among all contributors to the business. Most of the tools we were developing were targeted to enable the performance of executive functions. Below, we select four executive activities and discuss the gaps we found in Lean guidance. They are: defining a company's business intent, designing the organization, developing a market strategy, and structuring employee compensation.

Defining a Company's Business Intent

A statement of business intent expresses a company's purpose, vision, and core values; how it defines the meaning of profit; and the stakeholders the enterprise recognizes and its relationship with each. It also specifies the outcomes the business must produce at the Strategic level for it to claim success. The purpose component of this statement states what the business will produce for exchange, with whom, where, and why.

Lean thinking provides little guidance at all concerning how a Lean enterprise decides these issues. Here are a few examples. Can a company that makes a product that is inherently unhealthy (e.g., cigarettes) become a Lean enterprise? Can the pharmaceutical companies that knowingly produced and profited from drugs they knew were injurious to health (e.g., Celebrex, Vioxx, and OxyContin) have been Lean enterprises? What about the chemicals and coatings manufacturers who knew the toxic consequences of such products as teflon and talcum powder could produce yet sold them while hiding that knowledge? Or can any of the other producers of commodities that reap profits from selling products that undermine their buyers' well being be Lean enterprises? Is the *caveat emptor* ("let the buyer beware") principle that is perfectly appropriate within the commonly applied producer-focused, profit-driven capitalist approach to commerce also appropriate within a Lean enterprise?

Apart from the purpose component of a company's business intent, how should a Lean enterprise define *profit*? What constitutes profit in a Lean Enterprise? Is it *only* money acquired that exceeds costs? Is it money at all? Do monetary gains, in themselves, advance the purpose of a Lean enterprise? Or do they only advance it based on how that money is applied? Is learning profit? Is having more knowledgeable, better skilled contributors as a result of an organization's development efforts profit? In our image of what a Lean enterprise is, we answer these questions thusly. Profit is whatever directly advances the purpose of an enterprise. Monetary gains, in themselves, do not advance the purpose of a Lean enterprise. Only when surplus money is applied to advancing the value-adding capability of an enterprise does it have value within the context of the Lean Enterprise model. In this vein, we also would assert that developing learning that improves the value-adding performance of the enterprise *is* profit. So too is the result of having more knowledgeable people who are better skilled and capable of generating greater value-adding outputs. But, based on our research, such a set of answers would generate much disagreement and, most relevant here, there is not a body of authoritative knowledge within Lean thinking that one could use to resolve such disagreement.

Organizational Design

Organizations larger than a single work unit or implementing processes more complex than a single activity must divide their work into subsets of operations with progressively more specific focuses. This division of the work is called *departmentation*. Its output is represented by the various "boxes" that appear on a company's organization chart. Each box identifies a distinct work group. Each lower tier represents a more limited level of activity.

Beyond structuring its work, an organization's designer must distribute authority and responsibility for accomplishing the organization's goals across its work units. The designer also must define the reporting relationships among work units. His or her purpose is to clarify accountability for segments of the company's performance and to define the default communication path members should use. This task draws the solid or dotted lines that connect the boxes in an organization chart. An organization's designer completes the definition of the social aspect of an organization by clarifying the basic role organization members are expected to perform, their involvement in business decision making, and how they will work together to accomplish the purpose of the enterprise.

Based on our business consulting experience, the design of most if not all organizations is a hodgepodge of tradition, some logic, and a good deal of politics. For example, in most businesses you will find parts of one business function split away and placed under different function heads. This splintering of functions hinders implementing important aspects of the Lean Enterprise approach. These include implementing a business measurement system capable of supporting learning from performance; the implementation of an organization-wide, yearly planning and renewal process (Hoshin Kanri); and functional teaming within and across all work units and locations.

Realizing the problems with the existing designs of most businesses, we decided to develop a tool for reconceiving an organization so that it enables the implementation of Lean thinking. This purpose led to the question of how a Lean enterprise is organized. Most Lean community members would likely answer by value streams. But, operationally, what does that mean? A modern organization is composed of very many functions each of which has a value stream. How should they be identified? How should they interrelate? By whom should they be managed? We could not find content in our Lean literature research that addressed these questions. Yet, without that knowledge one cannot design an organization in a manner that will support critical elements of the Lean Enterprise model.

Absent explicit guidance, we developed a solution. That solution was triggered by statements made by Tokihiko Enomoto (1995) that revealed to us the role of Chester Barnard in Japanese management's conception of organizational structure.[5] But, this solution—despite its

[5] Chester Barnard (1886–1961) is considered by many to be the premier theorist on the topics of organization and executive functioning. His seminal work, *The Functions of the Executive*, was published in 1938 and is still taught in graduate programs in business and management today. While the model of organization and executive functions he formulated is an excellent fit to the current dominant approach to commerce, it is *antagonistic* to the Lean Enterprise approach. Nonetheless, his writings about how an organization should be structured, among other topics, were widely praised in Japan in the early 1950s and did contribute to the Lean model (Enomoto, 1995).

pedigree, logic, and utility—does not make it Lean thinking. As far as we can discern, Lean community members are not even aware of Barnard and his role in shaping Japanese management thinking.

Market Strategy

The Lean literature is markedly deficient in its discussion of the competitive strategies a Lean enterprise may undertake. Certainly, one well-rooted notion is that a Lean enterprise competes in the marketplace by offering its prospective customers better value than its competitors. Beyond that point, little to nothing is said about what other marketplace strategies a Lean enterprise should and should not use to realize its success. For example, one approach for competing in a marketplace is to use control strategies such as creating barriers to market entry by potential competitors so that customer choice is limited. IBM reportedly used this strategy to build its almost monopolistic control of the "big iron" mainframe computing market in the 1970s and 80s (Baase, 1974; U.S. Department of Justice, 1995). One technique used was "bundling." It "often required buyers to pay for a lot of services they did not want at all or could have obtained more cheaply elsewhere, but they wanted IBM equipment enough to accept the package deal" (Baase, 1974). As well, some customers complained that IBM threatened "to stop maintenance service or cancel leases if the user attache[d] equipment made by a competitor to an IBM main-frame" (Baase, 1974). Bill Gates' Microsoft Incorporated used a similar tactic in the 1980s to squash competition to its MS DOS operating system. It required all computer manufacturers to pay for an MS DOS license for every machine they made whether or not it had MS DOS installed. Otherwise, the vendor could not install MS DOS on any of its machines (U.S. Department of Justice, 1994). In both cases, the market strategies used were not judged illegal, although actions to modify the behaviors were negotiated with each company. Nonetheless, can a Lean enterprise use such strategies? If not, why not? Where does Lean stand on these practices? Can a company using market control strategies be a Lean enterprise?

Companies seeking a competitive advantage sometimes compete on price. One can restrain prices by applying Lean tools to remove waste thereby reducing cost and applying that saving to reducing prices. Another approach companies have used is simpler. It shifts cost to the customer without the customer seeing it. Consider a simple example involving rework costs. A company experiencing rework cost due to warranty failures can reduce that cost by determining the likely breakdown point for its product—essentially, its product's "mean time to failure," given the product's existing state of quality in terms of both its design and execution. With this information, it can adjust its warranty period so that there is less chance that a product failure will occur within the warranty period. By doing this, the company shifts that cost to its customers by arranging matters so that the buyer pays for the product's repair. Can a Lean enterprise use such a strategy? It is certainly legal. If you say "No," then what if the Lean enterprise is low on funds and can't afford to make improvements in its product? Would it then be acceptable? If so, why?

Still another strategy producers use to win customers involves withholding information from customers that might negatively affect one's sales or profits. As documented by Vitalo and Bujak (2019), Toyota used this strategy to protect its sales and profits during the period between 1995 and 2010.[6] It withheld information about defects in its cars. Before that, Tobacco companies used this strategy to sustain their sales of cigarettes for decades (Levin, 2006). More recently, Exxon has apparently used it to protect its highly profitable fossil fuel business (Banerjee and Song 2015; Banerjee, Song, and Hasemyer 2015; Banerjee, Song, and Hasemyer 2015a; Cushman, 2015; Hasemyer and Cushman, Jr., 2015; Song, Banerjee, and Hasemyer 2015). Again, can a Lean enterprise use this strategy? If not, why not?

Externalities

An externality is a cost (negative externality) or benefit (positive externality) experienced by a party who was not a participant in the transaction that caused the cost or benefit. Air pollution experienced in eastern states in the United States caused by coal-burning power generating companies operating in the western states is an example of negative externality. Companies implementing the dominant producer-focused, profit-maximizing approach to commerce do not recognize externalities as a producer responsibility. When a negative externality exists in a free market context, producers take no responsibility for the costs required to remedy it nor the human harm it produces. Rather, these consequences are passed on to society. Such companies employ a two part strategy in dealing with externalities. They seek to off-load negative externalities and to maximally benefit from positive externalities.[7] How should a Lean enterprise deal with externalities? What principles should guide its conduct? What is permissible and not permissible?[8]

Employee Compensation

Compensation is one of a set of actions that distribute the financial gains produced by a company. For employees, it includes base pay, variable pay, awards, and benefits. The commercial model a business implements (e.g. Capitalism) and, to some extent, the form of business it assumes (e.g., corporation, limited liability company, partnership) determine how compensation decisions are made and in whom the power for making them is vested.

Within a producer-focused, profit-maximizing corporation, management decides the compensation of all roles except the chief executive officer role. At least for hourly wage workers, the pay structure is designed to ensure the lowest cost compensation system that will attract,

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[6] See *Why Toyota Is Not Lean Thinking's 'Rosetta Stone'* (Vitalo and Bujak, 2019) for a thorough discussion of the limitations of using Toyota as your guide for understanding what constitutes the Lean approach to commerce.

[7] Milman (2019) reports on an effort underway to pass legislation that will extend to polluting corporations legal immunity for damages done to the environment by the pollutants they emitted. The law "would squash [a] raft of climate lawsuits launched by cities and counties across the US seeking compensation for damages." The promoters of this plan include British Petroleum, Exxon Mobil, Chevron, ConocoPhillips, Shell Oil Company, and Microsoft Corporation. Can any of these corporations be a Lean enterprise?

[8] Some may see Toyota's publicly expressed value of upholding one's community responsibility and acting as a good citizen as relevant here in clarifying Lean's position on externalities. However, we cannot simply use Toyota's public speech as a definition of Lean thinking, as the company's conduct has not always aligned with its public speech. See *Why Toyota Is Not Lean Thinking's 'Rosetta Stone'* (Vitalo and Bujak 2019) for thorough discussion of the limitations of using Toyota as your guide for understanding what constitutes the Lean approach to commerce.

motivate, and retain needed employees since the company seeks to maximize its profit and wages detract from profits.

What is Lean thinking's guidance on compensation? Liker and Hoseus (2008) describe the approach to compensation they report the Toyota Motor Corporation uses. In the absence of foundational knowledge, Toyota is used as the case example one studies to understand what constitutes the Lean approach to commerce. Toyota's guiding concept for compensation within the United States is "perceived fairness." If it sets compensation such that employees *perceive it as fair*, then compensation will be deemed acceptable from the employee's perspective. It judges that "perceived fairness" is essential to employee morale and retention, at least in the United States' culture.

Operationally, Toyota sets the pay for hourly wage workers using market surveys. These surveys reveal what other companies pay people in specific roles within a geographical area. These surveys always find a range of pay and Toyota attempts to either match the first or second best pay level in a given locale. This intent is subject to a controlling condition. Toyota "wants to be competitive *without giving away its profits* [italics added] (Liker and Hoseus, 2008, page 408)."

But, is "perceived fairness" really "fair?" And, if not, what approach is consistent with Lean thinking? Consider these facts. The findings of market surveys for determining a fair wage can be artificially depressed due to coordination between employers for the purpose of suppressing wages or through governmental actions that weaken labor's ability to organize and bargain for better wages. An example of the former action, is how major IT companies conspired to and succeeded in suppressing employee wages in Silicon Valley. "In early 2005, ... Apple's Steve Jobs sealed a secret and illegal pact with Google's Eric Schmidt to artificially push their workers wages lower by agreeing not to recruit each other's employees, sharing wage scale information, and punishing violators" (Ames, 2014). The participants in this agreement expanded to include Intel, Adobe, Intuit, and Pixar (Knoczal, 2014). With this collusion among employers, employee wages were effectively suppressed. As to governmental actions, over the last 60 years both at the state and federal governments have limited the right of workers to unionize, strike, and otherwise bargain for what they perceive to be fair wages. This weakened state of workers has been openly acknowledged by Federal Reserve Chairpersons Alan Greenspan and Janet Yellen (Pollin, 2002). By either of these means (employer coordination or governmental action), any market survey would reveal comparative wage levels that would be "perceived" as fair but, by any common sense measure, not be fair.

What if one took a different perspective to judge fairness, a perspective used by businesses themselves? Consider, for the moment, compensation as being an employee's return on investment. His or her investment is the time, effort, and skill applied in advancing the company's goals. It also includes all the costs associated with being able to make that investment. These include the currently non-reimbursed cost of the worker's prior education and non-

compensated time spent in developing his or her expertise. It also includes all costs associated with the worker's personal maintenance (food, shelter, clothing, safety, maintenance of fitness to work, etc.), and any expenses related directly to his or her work (e.g., travel, uniforms, cleaning of uniforms). One might challenge that a truly fair wage must deliver a positive return on this investment. Since employers look at their success in these terms, would it not be "fair" for employees to do likewise? Would this perspective be more consistent with Lean thinking?

Still another possible perspective on fairness is to set "total compensation" as a negotiated portion of the monetary value of what a worker produces for the business.[9] Such pay would reflect the actual yield of benefits the business derives from the worker's invested effort. Is this the perspective a Lean enterprise should assume?

Finally, consider this. According to Liker and Hoseus (2008), Toyota decides what compensation it will pay an employee with an eye to *preserving its profit*. It alone, without transparency, decides what amount of profit Toyota "deserves."[10] Would not equity in a Lean enterprise, with its emphasis on team and community, require that both employees and employer participate in this decision making with equal access to information?

Foundational Knowledge

The third significant problem with Lean thinking is the absence of an explicit statement of the basic theory that explains why the actions Lean thinking directs one to do make sense. This theoretical underpinning is the set of assumptions and derivative principles from which the model's various ideas and edicts flow and which explain why they work.

All theories of commerce and organizational performance are rooted in their premises about people. People are the agents who accomplish commerce and achieve corporate goals. They do it by direct action or by working through other people they manage. Especially with regard to management decision making and action, one needs to understand people's motives, values, inclinations, and purposes, and management must use that understanding to guide it in engaging, enabling, and supporting the performance of others.

Deming (2000) referred to this set of knowledge as "psychology," a fundamental understanding of the nature of people and the factors that affect their behavior.[11] It answers questions such as: Are people inclined to be self-serving? Do they act on the basis of external rewards alone or is their behavior directed by inner values and for reasons other than the acquisition of material rewards? Do people consider what effects their actions have on others? Are they inclined to ensure that their actions benefit others as well as themselves? Each of these questions affects whether

[9] This calculation could be refined to net out from the value produced whatever producer incurred costs were expended to produce that value and *add in* whatever costs for producing that value were born by the employee.

[10] We say, "without transparency" because we have not read anywhere that the Toyota Motor Corporation uses *open book accounting* to share financial information with its employees and nor do they share the specific decision criteria executives use in making financial choices.

[11] They also are describe the context within which people will be acting when they engage in commerce. For example, is the setting one in which each party has equal power and equal information? For our purposes here, we will defer addressing this set of assumptions.

and how an organization can be created and sustained; whether and how people can be aligned to a common goal; and whether and how one can successfully engage, involve, and enable their successful performance.

The prevailing producer-focused, profit-maximizing approach to commerce, for example, has explicit assumptions about human motivation and the end people pursue when interacting with others. Its view of people's nature is that they are driven to maximize their gains from every exchange with another and that they rationally pursue this end without regard for the impact of their decisions on others ("Homo Economicus") (Hubel, 2014; Yamagishi, Takagishi, Matsumoto, and Kiyonari, 2014). From these assumptions, the model deduces that each person looks out for his or her own interests and engages with others only on a *quid pro quo* basis. In every transaction, each party seeks to get more than he or she gives.

Based on this thinking, people join an organization to garner material rewards. Thus, employees should be recruited using monetary incentives. They should be persuaded that the deal being offered them is the best they can expect to find anywhere. As to obtaining from employees the performance the business seeks, employees must be 'managed'— i.e., actively supervised to ensure that they align to the organization's purpose since their intrinsic direction is to pursue their own interest. Given that their interest is to maximize their own benefits, they will be inclined to do the least to get the most (Hubel, 2014). That is, to take the rewards while not having to give the effort expected in return.

Within the context of seller-buyer exchanges, these assumptions translate into the rule of *caveat emptor*—"let the buyer beware." The producer-focused, profit-maximizing model assumes that it is the customer's responsibility to look out for his or her own interest, not the producer's. The producer seeks to maximize profit measured monetarily. The buyer seeks to maximize the satisfaction of his or her values, which, in economics, is also measured monetarily.

What are Lean Enterprise's assumptions about people? How does Lean thinking replace this producer-focused, profit-maximizing set of assumptions? Does Lean thinking accept that model's assumption that people operate from self-interest alone and are a singularly focused on maximizing their personal gain? Is a Lean marketplace ruled by *caveat emptor*?

If you think the answers to Lean's assumptions about people are contained in the Lean management literature, think again. Lean management guidance is essentially a set of rubrics that clarify what one should do and how one should behave. "Strive for perfection in all operations." "Respect people." And many others. While at first it may appear that one can extract from these rubrics Lean's view of the nature of people, that is not the case. For example, the two just mentioned rubrics might imply the need to correct a natural inclination within people—i.e., the inclination *not* strive to improve themselves and the natural inclination *not* to respect others. Or, they may be attempts to reinforce and encourage the free expression of an inherent inclination people already possess. Vitalo and Bujak (2019a) attempted to derive Lean's perspective on human nature from Lean management's rubrics and failed. In their article, *Why Lean Management's*

Rubrics Cannot Tell Us What Lean's View of People Is, they demonstrate that it is not possible to extract a definitive statement of Lean's perspective on the nature of people from its guidance on how to manage a Lean enterprise.

As an alternative to developing Lean's view of human nature, one might respond that there is no need to replace the assumptions about people that underpin the dominant producer-focused, profit-maximizing approach to commerce. People can act on a selfish basis and still provide benefit to others (i.e., value-adding products) because "benefiting others will maximize benefit for oneself."

This "enlightened self-interest" response, however, does not withstand real-world, rational analysis. First, in the zero sum world of the dominant approach to commerce (Emiliani 2004), any benefit a second party gains from a transaction is a benefit lost to the first party. Second, if I, as an individual, am driven to maximize my personal gain, I will seek out a way to get all I can from every exchange with another. Based on the self-interest model, I would search out and use methods that accomplish the redistribution of all benefits to myself. And, those methods both exist and are in use. Essentially, they boil down to establishing power over the other party in commerce. The means for doing this are many. A few have been described above. These methods may be direct, as through the use of deception, misinformation, or the withholding of information. They may be indirect, as through the manipulation of the commercial context by influencing law and regulation or by colluding with others.

If you counter argue that one cannot continue to exploit others in a commercial context over the long-term and win—again, you would be historically wrong. As just one example, big Tobacco did it and these firms continue to thrive today.

Finally, consider the time horizon of "self." By definition, it is the length of one's adult life or, more narrowly, one's commercial career. While a business may exist over many employee "lifetimes," it is implemented by people pursuing their self interest within their limited lifetimes. Any argument that self-interest will be constrained by the 'long view' in which the long view assumes the accumulation of wealth past one's personal lifetime is, by definition, nonsensical since it implies that self-interest persists past the death of 'self.'

Why Toyota Cannot Be Used to Close the Gaps

When in doubt about how Lean should respond to one or another issue, many Lean authors attempt to discern an answer by referencing the practices of the Toyota Motor Company. One source for Toyota's thinking is its famed document "The Toyota Way 2001." But as a resource for uncovering a deeper clarification of Lean thinking, it has proven disappointing. According to Baudin (2013), that document does not provide any deeper understanding of the "whys" behind Lean thinking. Baudin is one of a few people who were provided the opportunity to read the document. He states, "As a stand-alone document ... it's not that useful ... . Based on its content alone, it would be difficult to tell the Toyota Way apart from other corporate philosophies like the HP [Hewlitt-Packard] way. A manager of a mid-size traditional plant, reading The Toyota

Way 2001, would reasonably conclude that all he or she needed to do to emulate Toyota was follow its recommendations."

As an alternative, Lean writers have used their experiences in working with Toyota to help bridge some of the foundational knowledge gaps. But uncontrolled observations of specific work units in a worldwide organization do not render usable information for generalizing about how Toyota as a company behaves. Only a properly formed random sample of observational points across an organization and over a sufficient period of time can provide us with solid data. As we detailed in our exploration of this issue (Vitalo and Bujak, 2021), there are many inconsistencies between the performance of the Toyota Motor Company and so-called Lean thinking as derived from the selective work experiences reported by Lean authors. These inconsistencies occur at the strategic, operations, and executive functioning levels (see Appendix A). They are numerous and serious and occurred over a considerable period of time. To date, no one has established in an empirically valid manner what the *Toyota Way* is. Policy statements are insufficient, especially in light of officially endorsed and fully-documented violations of those policies reported Vitalo and Bujak's (2021) technical report.

The Missing Deming Content

If Lean community members seek to establish the set of premises that underlay their approach to executive functions, they have easy access to a beginning point. Our research to find answers to the problems described above, and others not detailed here, led us to revisit the work of W. Edwards Deming. We say revisit because both of the current authors had studied and used Deming's ideas in our early careers as managers and consultants. When Lean emerged, we both heard echoes of Deming in its edicts but rarely saw any mention of him outside of Lean's incorporation of his Plan Do Check Act tool for guiding problem solving actions.[12] Based on our further research of Deming (Vitalo, 2017), however, it was clear to us that he had made *the* seminal contribution to what evolved into the Lean model. We based this judgment on the following facts:

- First, Deming's thinking and the Lean model's views concerning the role of executives, managers, and supervisors are essentially identical *except* that Deming's provides a theoretical underpinning for it.
- Second, Deming taught the leaders of Japanese industry about the quality approach to commerce through the auspices of the Union of Japanese Science and Engineering (JUSE) beginning in June, 1950. His teaching of top Japanese management began in 1950 at the Hotel de Yama on Mt. Hakone in Japan (Deming, 1950a, 1982a). He continued to teach and consult with Japanese management throughout the decade and into the 1960s.[13]

[12] Actually, the tool derives from Shewhart. Deming consistently represents the four-stage Shewhart cycle as plan, do, study, and act and sees it as a systematic process for uncovering "learning, and for improvement of a product or process" (Deming, 2000, page 131).[1] In his earlier works, he refers to it as the "Shewhart Cycle." Later, he labels it the "PDSA Cycle." See Exhibit 14, Deming's Different Representations of the Shewhart Cycle in *Deming Revisited: The Real Quality Model for Commerce* (Vitalo, 2017).

[13] Noguchi (1995) claims that Deming did not specifically teach his "14 management points" in Japan; however, a review of the contents of his lectures and his notes indicate that the same ideas were embedded in the content he presented.

- Third, Deming played a pivotal role in enabling the resurrection of Japanese industry to its place of worldwide importance in the post 1950s era. Indeed, Japan, as a nation, recognized Deming's contributions to the resurrection of its industry by extending to him the Second Order Medal of the Sacred Treasure.
- Fourth, Ohno himself stated, "The Toyota production system is one and the same with TQC[14] ... . They are simply different names for the same basic approach" (Shimokawa and Fujimoto, 2009, page 3).[15]
- Fifth, Masao Nemoto, a former Toyota senior Manager, credited Womack, Jones, and Roos' original book on Lean by stating that, "It was truly an excellent book." But, he went on to say that, "Its one really disappointing flaw is that it fails to mention the role of TQC in Lean manufacturing. It's a pretty thick book, but even where it mentions quality control, it leaves off the *T* [for Total]" (Shimokawa and Fujimoto, 2009, page 175).
- Sixth, Toyota's rise as an automobile manufacturer took off in the 1960s *after it adopted Deming's quality management approach* (Shimokawa and Fujimoto, 2009, page 177).
- Seventh, Deming's contributions to the Lean model, as practiced by Toyota Motor Corporation, were personally acknowledged and appreciated by Dr. Shoichiro Toyoda, the son of the founder of the Toyota Motor Corporation and its chairman from 1992–1999. "Everyday I think about what he [Deming] meant to us," said Dr. Toyoda, "Deming is the core of our management" (Toyoda, 1988). The Toyota Production System is often cited as a foundation for the Lean Enterprise model.
- Eighth, many elements essential to Lean thinking were first expressed by Deming in his teaching to Japanese leaders. Just one example is the concept of the value stream and the necessity of managing from the perspective of the whole system. In *Out of Crisis*, Deming reproduces a graphic of what, in the Lean lexicon, we term the extended value stream (Deming, 1982a, Figure 1, page 4). In its caption, he tells us that "This chart was first used in August 1950 at a conference with top Japanese management at the Hotel de Yama on Mt. Hakone in Japan." Elsewhere he states "The simple flow diagram was on the blackboard at every conference with top management from 1950 and onward" (Deming, 2000, page 57). Another example is the redefinition of the management role from oversight and control to enabler of every employee's success (Vitalo, 2017). Exhibit 3, next page, provides additional examples.

[14] TQC is the term used at Toyota to refer to Deming's total quality management as reflected in the standards used to assess the Deming Quality Prize in Japan (Union of Japanese Scientists and Engineers, 2016).

[15] Of course, Ohno did also reveal in this statement his incorrect understand of total quality management as he aligns it with the "principle of zero defects" (Shimokawa and Fujimoto, 2009, page 3). Deming abhorred "zero defect" and condemned it as a empty slogan. He stated, "Of course we do not want to violate specification, but to meet specifications is not enough" (Deming, 2000, page 16). One can have zero defects many ways, most which can still deliver customers undesired outputs to customers. Nonetheless, Michikazu Tanaka, a student Ohno, does confirm the importance of Deming. He reports that, "Ohno always said, 'Kanban won't work right anywhere that TQC isn't working right. ... The kanban system only works when you're making quality products'" (Shimokawa and Fujimoto 2009, page 9). Thus, Ohno's acknowledgment of Deming's contribution appears to stand.

Most relevant to this paper, Deming's teaching is underpinned by four sets of what he termed "profound knowledge" and we term, "foundational knowledge." He declares managers must master this knowledge because it provides the "why" behind all management decision making and actions (Deming, 2000; Vitalo, 2017). These four domains of knowledge are:

- a theory of organization (the nature of systems),
- the concept of variation and its significance,
- a theory of knowledge, and
- the basic principles that reveal the nature of people and the source of their striving.

Should the Lean community seek to develop its fundamental premises about the nature of people, human organizations, and commerce itself, Deming's thinking would be the place to start. It provides a knowledge foundation for all Lean's executive guidance.

To explore further Deming contributions to Lean thinking, see *Deming Revisited: The Real Quality Model* (Vitalo, 2017). This monograph provides a detailed analysis of Deming's thinking and contains citations to his original works. Use this monograph as a pathway into primary sources: Deming, 1950, 1950a, 1967, 1975, 1982, 1982a, 1988; Reddie 2001; and Deming Prize, 2006.

Exhibit 3. Examples of Elements in Lean Thinking First Expressed by Deming

1. Anchoring enterprise success in maximizing the delivery of value to customers as judged by customers. (Aim of commerce)
2. Deming's inclusive perspective as to whom commerce must benefit— customers, employees. owners, suppliers, community, etc. (Stakeholders to commerce)
3. Anchoring product development and all improvement efforts in research revealing customer wants and needs (Customer research)
4. Using cross-functional teaming in developing new products and their implementing processes (Teamed product development)
5. The concept of preventing errors rather than correcting mistakes. (Poka yoke)
6. The continuous pursuit of perfection through an endless cycle of Research, Design, Production, Sales (Deming Wheel)
7. The role of continuous improvement through learning as the engine of commercial success (Learning as the engine of improvement)
8. The use of systematic methods to solve problems in production and the use of experimentation to research new ways to improve products and methods (Problem solving and Experimentation)
9. The recognition that the greatest waste in enterprise is the failure to recognize and engage the knowledge and full capabilities of employees
10. The re-definition of the role for management from oversight and control to enabler of every employee's success (Manager as enabler)
11. The responsibility of managers to support every employee in realizing the fullness of his or her capabilities. (Employee development)
12. The importance of effective training in enabling employee success (Training development)
13. The importance of the supply chain and teaming with suppliers to realize the deliver of maximum value to customers (Supply chain integration)
14. The edict that manager decisions and action must be based on knowledge not intuition or the mere imitation of others. (Knowledge-driven management)
15. The necessity for management to manage from the perspective of the whole system and avoid local optimization (Avoid component optimization)
16. The use of the value stream concept and graphic to enable people to envision the whole system (Value stream mapping)
17. The understanding that process improvement required process standardization and documentation. (Standardized work)
18. The development of a culture of teaming across the enterprise (Teamed organization)
19. The use of measurement of *both* process and outcome and its use to support learning by everyone (Measure means and ends)

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Introduction

In the absence of foundational knowledge[1] with which the content of Lean thinking can be explained and extended to address new situations, the Lean community turns to the Toyota Motor Corporation's practices. In this sense, Toyota functions as their "Rosetta Stone." It is used to decipher what is and is not "Lean thinking."

There are problems, however, in using a case example, such as the Toyota Motor Corporation, as your guidance for conducting commerce. First, every individual demonstrates variation in his or her behavior across situations and over time. When one studies a large, international organization, the problem of variation is greatly magnified by the numbers of people, work settings, and geographical locations in which the company operates. Second, people are sensitive to how they are perceived. We all have an image of ourselves, but few of us have an "objective image"—i.e., one based solely on empirical facts verified from multiple perspectives. Commercial organizations are especially sensitive about their image, as public perceptions can affect their commercial success. Hence, self-report is subject to bias. That bias may be quite unintentional, yet real. Third, if you have worked at the executive level within large corporations, you are aware that there are levels of decision-making and action that are kept confidential. The record of these discussions is not publicly available. Hence, not all the facts about a company are available for review. Fourth, there are almost always gaps between written policy and action. Within the Human Resource function, for example, compensation rules may be relaxed for specific individuals, usually executive level employees. These decisions are made on a case-by-case basis and their record, if one exists, is also not publicly available. As another example, take the comparative compensation between male and female employees. When studied empirically, compensation paid to males is discovered to be higher than the compensation paid to females performing the same work, at the same level of proficiency. The senior author has done such employee compensation studies and documented the male-female discrepancy. In every such study, the existing, written compensation policy was 'sex neutral.' Never did they direct unequal pay.

To derive usable information about the actual behavior of an institution, therefore, one must employ a sophisticated sampling strategy that draws facts from multiple perspectives, controls for confounding variables, and uses objective records. The sampling must include observations from all the different levels of the organization, across its various departments and locations, and across time. The researcher must have access to the non-public aspects of the organizational decisions and actions taken by the subject institution. Even at its best, the image of conduct derived is only probable, not certain. Once assembled, the information must be categorized and systematically assessed to discover what if any trends in conduct may be properly asserted as being typical of an organization.

[1] Foundational knowledge refers to the set of concepts, principles, and relations used to explain the "why" underlying observed facts or the set of assumptions from which the judgments and directives of a deductive knowledge systems are deduced.

Finally, even when you have implemented such a well designed naturalistic study, you are only left with verified conduct and its apparent results—not with knowledge that explains why the conduct and results correspond. One could use such findings to generate hypotheses about the causes that might explain of the correspondence between observed behavior and results, With these hypotheses, one could undertake controlled experiments to validate them. To our knowledge, the Lean community has not done this. At best, therefore, one can only imitate what has been documented. With regard to Lean thinking, however, knowledge is expected to drive behavior, not imitation.

A Real World Example of the Limits of Observation

In monograph, *The Incompleteness of the Lean Enterprise Model*, Vitalo and Bujak (2019) identify a number of market strategies that capitalist business use and ask whether a Lean enterprise can us them. Here, we address three such business strategies: externalizing costs, withholding negative information from the public, and deception. If you use Toyota's behavior as your reference for deciding this question and picked a point in history when otherwise hidden information became revealed, you would find that Toyota has indeed used these methods to advance its profits. Specifically, it withheld information and released inaccurate information about company actions and product defects from customers and government regulators in order to protect its profits. Revealing that information would have provoked a vehicle recall and exposed them to liability claims. Thus, Toyota externalized the cost of poor quality to its customers who were left to pay for repairs of the defect and any other damages it might have caused.

Based on public records, we can say that Toyota practiced these strategies during the period of 1995 through 2010. The first example concerns Toyota's handling of a steering mechanism problem with their Hilux Surfs and 4Runner vehicles in the 1990s. The second example concerns how it addressed unintended acceleration problem of some of its vehicles and two related problems with gas pedals installed in various models in the 2000s.

Steering Mechanism Problem—Hilux Surfs and 4Runners

The Hilux Surfs and 4Runner's steering mechanism problem became public in Japan in 2004. Its exposure was the result of a police investigation into the crash of an out-of-control Hilux Surf. The crash caused serious injury to five people. The police investigation into this accident triggered a scandal that provoked Toyota to acknowledge the problem and recall 330,000 affected Hilux Surfs and 4Runners in Japan.

While this public revelation occurred in 2004, facts make clear that Toyota was aware of the problem with the Hilux Surfs and 4Runners from the beginning of 1996. They also reveal that the problem extended backwards to earlier models. In 1996, "Toyota engineers discovered that a crucial steering mechanism could fracture on the Hilux Surf, which was sold as the 4Runner in the United States" (Kanter, Maynard, and Tabuchi 2010). While it corrected the flaw in 1996 models,

Toyota took *no action* to alert the owners of the 1995 and earlier models of the danger. After Toyota received a rebuke from the Japanese government in 2004, it executed the recall in Japan *but not* in the U.S. for its 4Runner model (Kanter, Maynard, and Tabuchi 2010). Thus, it left its American customers at risk of harm and bearing the cost of repair for the defect and any damage or harm its failure caused.

Further, other Toyota truck models sold in the U.S. (e.g., Toyota 4x4 and T100 pickups) used the very same linkage, a steering relay rod, that was found defective in Japan. Rather than recall these vehicles, Toyota told the U.S. National Highway Traffic Safety Administration (NHTSA) in October 2004 that it would not conduct a recall in the U.S. because it had not received information here indicating a problem with the part. This was a lie. As later reported in the Los Angeles Times, "Documents entered into four lawsuits filed in Los Angeles ... revealed that Toyota had received numerous consumer complaints dating from 2000" about linkage problems with its Toyota 4x4 and T100 pickups (Bensinger and Vartabedian 2009).

Unintended Vehicle Acceleration and Gas Pedal Problems

As to unintended sudden acceleration and gas pedal problems, the first instance was uncovered in 2003. Internal Toyota documents, discovered during a court case filed against Toyota, revealed that earlier in that year a company technician described a case of sudden, unintended acceleration in a Toyota model. According to a court document filed in U.S. District Court in California in 2010, the technician, in 2003, "requested immediate action due to the 'extreme dangerous problem' and [said] 'we are also much afraid of [the] frequency on [sic] this problem in the near future'" (Whoriskey 2010).

Later in 2003, routine testing revealed that the Sienna minivan had a problem with a part which could come loose causing the gas pedal to stick, potentially causing unintended acceleration. It affected both current and previous year models. Toyota redesigned the part and installed it in 2004 models, but chose once again not to tell owners who bought Sienna's before 2004. In 2009, when investigations revealed what Toyota had done, it explained its action on the basis that "a safety recall was not justified" and the corrected part was simply "an added safety measure" (Bensinger and Vartabedian, 2009).

Yet another problem with gas pedals was uncovered in 2008 in Europe. Toyota responded by making a design change in the summer of 2009 in the manufacturing of cars in Europe going forward, *but did not* make the change to the same models produced elsewhere. Also, it did not recall the already sold cars in Europe because the company considered the problem a "consumer satisfaction" issue. Then, almost a year later, after the problem was publicly exposed in the U.S., a recall was issued.

As to the U.S. recall, Toyota claimed that it did not issue it earlier because *it just discovered* the gas pedal problem in the U.S. This statement was made despite records that showed it modified

the same pedal to address the same problem in Europe the year earlier (Kanter, Maynard, and Tabuchi 2010).

Across these actions to address unintended acceleration and gas pedal problems, Toyota externalized the cost of defects in its cars by off-loading it to customers in terms of risk, injury, and personally funded repairs. It controlled the information flow about the problem in various countries until it was 'outed.' And, on several occasions, it appeared to deceive government regulators and the public. Why? Clearly, recalls are costly and potentially impact sales thereby deflating profit. This suggests that maintaining or increasing its profits outweighed concern for customers.

Pure speculation? Then consider the July 2009 presentation by Toyota staff to Yoshimi Inaba, then Executive Vice President, Member of the Board and Chief Officer of the North America Operations Group. The presentation was entitled, "Wins for Toyota -- Safety Group." In the presentation, U.S. Toyota executive's "boasted of saving hundreds of millions of dollars by getting the federal highway safety regulators to limit the scope of recalls" for floor mats in some Toyota and Lexus vehicles (Maynard 2010; CNBC 2010). The floor mats could cause unintended acceleration (Valdes-Dapena 2010). In Mr. Inaba's 2010 testimony to the U.S. House Oversight and Government Reform Committee, he implicitly admitted that he was briefed on the Safety Group's "successes" when he stated that he could not remember the meeting where he was briefed on the memo "with any depth" (Bensinger and Vartabedian 2010).

Other "wins for Toyota" lauded in the same presentation were a $124 million savings reaped by winning a phase-in to new safety regulations for side air bags and an $11 million savings reaped by delaying a rule for tougher door locks (Thomas 2010). Also credited as wins were: "Avoided investigation on 'Tacoma rust' and helping win delays in various new federal safety regulations" (Valdes-Dapena 2010).

In response to the facts of this presentation, a Toyota spokesperson said, "Our first priority is the safety of our customers and to conclude otherwise on the basis of one internal presentation is wrong. Our values have always been to put the customer first and ensure the highest levels of safety and quality" (Thomas 2010). The conflict between the facts of this internal presentation and the spokesperson's assertions were not explained. No one asked how, given this unassailable ethic, such a presentation could made to an executive officer and member of the board of Toyota (Yoshimi Inaba) without the least concern for reprimand for being unaligned with Toyota's "first priority."

Aberration or Clearer Image of the Toyota Motor Corporation?

To answer the question of whether the handling of the Hilux Surfs and 4Runners steering mechanism problems and the separate issue of unintended acceleration were aberrations, consider the findings of a deeper analysis of the Toyota Motor Corporation's conduct during the period 1995–2010 (see Exhibit A1, beginning on the page 6). This period offers an unusual window into

Toyota's actual executive practices because of a significant increase in investigative news coverage of the company. Also, the discovery processes of a number of lawsuits against Toyota became public and facts previously unrevealed were available for scrutiny. As a result, many revelations emerged about executive actions that hitherto had not been reported.

Both before and after this period, news coverage reverted to reporting traditional business performance information. Thus, we have no way to assess whether conduct similar to that reported in Exhibit A1 existed before 1995 or after 2010. Nonetheless, 15 years is a long period of performance. The factual occurrences revealed are many and the pattern of conduct in relation to customers, employees, and the community at large appears highly consistent yet thoroughly inconsistent with Toyota's publicly asserted ethic.

Given its length of occurrence and the consistency of performance that significantly deviates from the declared values and practices of the company, it seems highly unlikely that this pattern of conduct emerged *de novo* in 1995. Indeed, all the major Toyota actors in this historical record had long and significant careers in the Toyota Motor Corporation prior to 1995.

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010

Year	Event
1995	Hiroshi Okuda is named chief executive officer (CEO). He is one of three "professional managers" who reportedly seek to neutralize the influence of the Toyoda family as they chart what they considered a new and improved direction for the company (Shirouzu 2010). These managers included Mr. Okuda and Toyota's next two CEOs—Fujio Cho and Katsuaki Watanabe.
1996	■ Mr. Okuda and aides unveil a new strategy dubbed the "2005 Vision." It focuses on financial achievement—growing rapidly while relying less on exports and more on factories producing locally in target markets (Shirouzu 2010). The Vision also pushes Toyota "to implement kakushin, or revolutionary innovations, in vehicle design and manufacturing." It includes "efficiency drives to reduce costs, not only through conventional means, such as simplifying designs and using cheaper materials, but also by changing the way cars are engineered. For example, engineers [are] pushed to combine functions into fewer parts and systems. Their aim: cut the number of components in a car by half" (Shirouzu 2010). ■ A "Global Profit Management Plan" is adopted by top executives. It assigns to sales executives around the world specific profitability goals (Shirouzu 2010). As part of their implementation of this plan and the subsequent Vision 2010, the succession of nonfamily CEOs later acknowledge that they hired a large number of inexperienced contract engineers across a 10-year period as a means to cut cost and support their rapid growth agenda (Shirouzu 2010). ■ Toyota engineers discover that a crucial steering mechanism component could fail on the model it sold as Hilux Surfs in Japan and 4Runner in the U.S. It corrected the flaw in future models but took no action to alert owners of prior year models that had the same dangerous flaw.
1998	■ Design-to-market is sped up. A "newly designed auto can be on the market in 18 months" (Clark 1998). According to Peter Boardman of UBS Securities, Ltd., one reason for Okuda's success is that he set results targets for employees and motivates upper management to realize them by giving them stock options contingent on realizing their targets. Using 'carrot and stick' motivating methods is not usually considered part of the Toyota Way. Also, focusing solely on results and not equally on process from which learning can be derived is a significant deviation from the Toyota Way (Imai 1986; Liker 2004). ■ Mr. Okuda characterizes himself as "always interested in changing the systems—in destroying." Later, when asked to define his own personality, he reportedly responds, "Destructive isn't it? Because I am always destroying the existing order or existing systems. I don't want to stay in the same place. That applies to myself and to Toyota" (Clark 1998).
1999	■ Fujio Cho becomes Toyota's new CEO. Mr. Okuda becomes chairman and president of Toyota Motor Corporation. Mr. Cho is later credited with accelerating the growth thrust initiated by Mr. Okuda (Lewis 2010). ■ Cho names Yoshimi Inaba as president and CEO of Toyota Motor Sales (TMS), U.S.A., Inc. Mr. Inaba is described as "blunt-spoken." He is "a marketer, not an engineer; under Mr. Inaba, the American Toyota was slowly moving away from consensus management and toward more rapid decision making" (Lewis 2010). ('More rapid decision making' is sometimes a euphemism for unilateral decision making.) *Continued ...*

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010 (continued)

Year	Event
2000	■ Mr. Okuda, then chairman and president of Toyota Motor Corporation, publicly shares his belief that Toyota needs to move beyond the Toyodas. He tells the Wall Street Journal in a 2000 interview, "The Toyoda family will eventually become a 'shrine' to the company's foundation, to which we will pay respect once a year" (Shirouzu 2010). Asked about the future prospects for Akio Toyoda, then a 43-year-old general manager, Mr. Okuda states: 'Nepotism just doesn't belong in our future.' He elaborated: *'Akio- class talents are rolling around all over Toyota, like so many potatoes'*" [italics added] (Shirouzu 2010). No one asked Mr. Okuda how such an attitude aligned with Toyota's fundamental principle of "respect for people." ■ Toyota begins phenomenal period of sales growth adding 600,000 new car sales per year (Shirouzu, 2010). But quality begins to flag. Toyota brand ranks fourth in quality rankings by new car owners while its Lexus model is ranked first by *used car owners* (Shirouzu 2010). As well, Toyota begins a phenomenal period of increasing worldwide automobile recalls. 2001 has three times more recalls than 2000. (Shirouzu 2010). ■ A Missouri state judge sanctions Toyota for failing to disclose results of five rear-impact tests of Corollas "despite numerous discovery requests" (Bensinger and Vartabedian 2009).
2001	Katsuaki Watanabe, Toyota's next CEO and current head of purchasing, begins an effort to squeeze one trillion yen out of its parts purchasing. "With two colleagues, he pushed Toyota and its parts suppliers to tweak the way they designed and made 173 components and systems to make them simpler and less expensive without affecting quality. The initiative was dubbed 'Construction of Cost Competitiveness for the 21st Century." Mr. Watanabe reported that his effort was provoked by a benchmarking activity that revealed, paradoxically, that Toyota paid less than its competitors for slightly more than 50% of its purchased components. Yet, Mr. Watanabe considered this result as "outright humiliating" and launched his cost cutting initiative (Shirouzu 2006).
2002	"Starting around 2002, Mr. Watanabe and his colleagues began pushing the company's powerful manufacturing gurus to re-think Toyota's much-admired 'Lean production'" (Shirouzu 2006a). This was an extension of the effort begun in 1996 with Mr. Okuda's introduction of Vision 2005. That strategy pushed Toyota to implement *kakushin*, meaning innovation or reform as in radical redesign (Miller 2006). This shift stands in dramatic opposition to Toyota's tradition of *kaizen*. Mr. Watanabe's push is said to have been a reaction to discovering that many of Toyota's manufacturing machines were "too big, clunky, and slow" (Shirouzu 2006a). No one asked why the action was not based on a root cause analysis of why TPS' long tradition of "right sizing" machines had ceased to be implemented or how this waste went undetected. One example of the application of kakushin is the radical redesign Toyota's car painting approach at two new plants, one in Guangzhou, China, and the other in San Antonio, Texas. In an odd comment, Mr. Watanabe states that the issue of the long paint line (some three miles long) used in existing plants seemed to "escape the attention of engineers" and then muses that he noticed the issue, wondered why it was so, *but never asked the question or pointed out the issue to the engineers in the plant he managed*. *Continued ...*

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010 (continued)

Year	Event
2002 cont'd	"To replace the process of slowly dragging a car through a 115-foot-long bath of anticorrosion undercoating, Toyota engineers say they have come up with a process they analogized to eating fondue. A car body is 'swished' like a chunk of bread in the paint pool to make the paint stick, eliminating the need for the long pool. A Toyota spokesman says the goal is to halve the length of the paint line. The new paint idea is being installed under strict secrecy and is so advanced that Toyota hasn't shown it to any outsider" (Shirouzu 2006a). A later evaluation of the intended improvement found that "the new system costs roughly four times as much to set up as the traditional process, while producing ... minimal improvements in the quality of the paint job and its efficiency" (Shirouzu and Murphy 2009). ■ Fujio Cho extends Vision 2005's financial focus and priorities with the introduction of 2010 Vision. It sets a global market share target of 15% (Shirouzu 2010). "To cut costs, Toyota 'dramatically reduces' crash testing of new car models, according to Koji Endo, a longtime car analyst and managing director of Advanced Research Japan" (Harden 2010). Endo explains, "They do virtual testing using computer models ... [but] from time to time there are real-world problems that the computer models do not account for" (Harden 2010).
2003	■ Toyota first becomes aware of a problem with sudden, unintended acceleration through a field report from a company technician. The technician describes a case of sudden, unintended acceleration in a Toyota model. According to a court document filed in U.S. District Court in California, the "author requested immediate action due to the 'extreme dangerous problem' and [said] 'we are also much afraid of frequency on [sic] this problem in the near future'" (Whoriskey 2010). ■ Routine testing reveals that the Sienna minivan had a problem with a part which could come loose causing the gas pedal to stick. Toyota redesigned the part and installed it in 2004 models, but chose not to tell owners who bought earlier versions of the vehicle that had the same problem. In 2009, when investigations revealed what Toyota had done, it explained its action on the basis that "a safety recall was not justified" and the corrected part was simply "an added safety measure" (Bensinger and Vartabedian 2009).
2004	■ Fujio Cho uses a 'fear-based strategy' to spur the drive for greater sales. In a Financial Times interview he warns of potential disaster unless Toyota reinvents itself. "Steady success is good, but it can foster serious weaknesses. Complacency sets in, customer focus declines, creative ideas dry up and before you know it, you are in trouble" (Levine 2004). Cho observes. No one asks why complacency would set in within a company whose people are committed to continuous improvement, have a 50-plus year record of living that commitment, and the highest level of employee participation in contributing improvement ideas worldwide. Nor did they ask how the goals he defines (increase sales of Prius—he seeks a 300,000 unit sales increase by 2005, a five-fold increase as compared to Toyota's 2003 level)—represent intensified customer focus. Cho continued, "The sense of crisis we feel, despite increasing sales and profits, stems from our fear that we have not kept up." *Continued ...*

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010 (continued)

Year	Event
2004 cont'd	No one asks whether Mr. Cho has applied Toyota's famed A3 problem solving method to uncover the reasons for their failure to 'keep up.' Nor did anyone ask how keeping up with others was a core concern in the Toyota approach to business success. ■ In an interview with Forbes magazine, Cho states, "The challenge for Toyota is to achieve more meaningful growth." What does meaningful growth mean? "By meaningful growth, I don't mean bigger numbers. I mean, growing Toyota into a company that truly matters – to our customers, our employees, our suppliers and to the societies where we live. Our biggest challenge is not to grow larger, but to grow better. We want to make better cars that sell for even lower prices; we want to make all our stakeholders feel good about being associated with Toyota; and we want to recycle some of our profits back into society" (Levine 2004). The interviewer did not think to ask why all the company's priority goals under Mr. Cho were in financial terms (sales, market share, profitability, cost reduction, seeking "bigger numbers") when what truly matters is "meaningful growth." ■ Toyota recalls 330,000 pre-1996 Hilux Surfs and 4Runners in Japan for dangerous steering mechanisms after an out-of-control Hilux Surf crashes causing serious injury to five people. The recall was provoked by a police investigation into the accident. The defect was discovered by Toyota in 1996. Toyota received a rebuke from the Japanese government and was ordered to revamped its recall system (Kanter, Maynard, and Tabuchi 2010). Although other truck models sold in the U.S. used the same problematic part, Toyota told the National Highway Traffic Safety Administration (NHTSA) in October 2004 that it would not conduct a recall in the U.S. because it had not received information here indicating a problem with the part. As reported in the Los Angeles Times, "Documents entered into four lawsuits filed in Los Angeles [in 2009], however, revealed that Toyota had received numerous consumer complaints dating from 2000" (Bensinger and Vartabedian 2009). ■ Katsuaki Watanabe's push to squeeze one trillion yen out of Toyota's parts purchasing, begun in 2000, realizes its cost reduction goal and is declared a success (Shirouzu, 2006b). The requirement that quality not suffer seems to have failed based on 10-fold increase in yearly auto recalls since 2000. This failure, however, is not noted in the declaration of success. Recalls in 2004 were in excess of 50% of all new cars sold in 2004, approximately 1.1 million recalls (Shirouzu 2006). ■ In June, "the National Highway Traffic Safety Administration (NHTSA) sends Toyota a chart showing that Toyota Camrys with electronic throttle controls had over 400% more 'vehicle speed' complaints than Camrys with manual controls" (Waxman and Stupak 2010). There is no report of any action taken. *Continued ...*

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010 (continued)

Year	Event
2005	■ Katsuaki Watanabe is named CEO to succeed Fujio Cho. He sets two trillion yen in operating profits as the company's target and pushes for its achievement. ■ Quality reaches a new nadir. Toyota's worldwide automobile recalls climb to approximately 4.5 million vehicles, some 45 times more than 2000 (Shirouzu 2010). In the U.S. alone, its recalls reach 2.38 million, more than the 2.26 million new cars sold in the U.S. during 2005 (Shirouzu 2006).
2006	■ At the June annual meeting, "outgoing chairman Hiroshi Okuda, its new chairman, Fujio Cho, and its chief executive Katsuaki Watanabe, all vowed ... that the quality issue would be addressed" (Maynard and Fackler 2006). They are reported as "considering" slowing the company's growth pace in response to escalating recalls and quality issues (Shirouzu 2006). Subsequent actions with regard to goals and the drive on growth seem to indicate that the "consideration" was rejected. As noted in an August 2006 news article, "Toyota's quality issues do not seem to be dampening its operations either in Japan or the United States ... . Nor is it affecting Toyota's net income, which climbed 39.2 percent during the second quarter to $3.2 billion" (Maynard and Fackler 2006). ■ Akio Toyoda and Shinichi Sasaki are placed in charge of Toyota's effort to improve its quality problems. In a speech to company engineers, Mr. Toyoda urges them to change their mindsets from producing volume to engineering quality. Apart from Aikio's personal urging, however, company goals, plans, and incentives remain unchanged (Shirouzu 2010). ■ A senior Toyota engineer is quoted as stating that the company has made "a clear and conscious change" in the way it handles recalls. "We used to do quiet recalls called 'service campaigns' to deal with many defects, but we're not going to hide anything anymore" (Shirouzu 2006). The assertion was made in response to recent vehicle defect scandals in Japan that involved Mitsubishi Motors and also Toyota. Subsequent events (see below) suggest that the engineer's pronouncement of change may not have been well informed. ■ In response to the Japanese government's dissatisfaction with Toyota's unresponsiveness to customer complaints and its slow action on recalls, Toyota promises to create "a new computer database to obtain information more quickly from dealers on repairs and complaints" (Maynard and Fackler 2006). ■ Toyota's "quality problem" emerged in parallel to Toyota's drive on cost reductions and increased profits to fund global growth and the achievement of the top position in sales and revenue among automobile manufacturers. In analyzing the reasons for the problem, observers offer an number of ideas. For example, as part of that strategy, engineers have been pressed to pump out more new models faster. "Product development bosses kept engineers on tight launch schedules. Toyota used virtual testing to replace hands-on driver testing "to radically compress vehicle-development times" and cut costs by slashing the number of prototypes needed from 60 to just 20 (Shirouzu 2006). Consistent with this analysis, a senior Toyota engineer reported that the fast pace of new model launches and *Continued ...*

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010 (continued)

Year	Event
2006 cont'd	pressure to maintain schedules has given rise to "bonehead" mistakes (Shirouzu 2006). Executives and engineers also reported that another cause was the pressure "to use the same components in a wider range of vehicles to save costs." Later, in 2010, it was also acknowledged that the hiring of a large number of inexperienced contract engineers across a 10-year period as a means to cut cost and support the company's rapid growth agenda was yet another causal factor (Shirouzu 2010). ■ Also in 2006, Mr. Watanabe, in a Wall Street Journal interview, "groused" that "Toyota's factories and engineering practices aren't efficient enough. Within the company, he even questioned a core tenet of Toyota's corporate culture -- kaizen, the relentless focus on incremental improvement" (Shirouzu 2006a). In the interview he also characterizes his executive style. "I am told a CEO should worry about big-picture stuff and shouldn't be concerned about minute details," he says. "I am obsessed with details, I will be an irritant, and I am persistent. I am going to grumble if the shop floor is cluttered or too greasy" (Shirouzu 2006a).
2007	The California Court of Appeal finds "that 'Toyota had intentionally violated two orders compelling discovery' of stability testing results in a case involving a Toyota-made forklift that tipped over and killed a worker." The court fined Toyota $138,984.33 and ordered a new trial (Bensinger and Vartabedian 2009).
2008	■ Toyota's operating profit reaches an industry high 8.6% (1.76 trillion yen). It unseats General Motors as the worlds biggest auto maker in terms of unit sales (Shirouzu , 2010 Shirouzu and Murphy 2009). ■ CEO Watanabe breaks with Toyota protocol "by single-handedly deciding what vehicles would be built at a factory under construction in Mississippi ... without first consulting other executives" (Shirouzu and Murphy 2009). ■ Toyota executives seek greater profit by pushing up prices "for an array of models including the redesigned Corolla" despite dealer feedback that the new pricing was too high from a consumer perspective. The price increases of about $1,000 to $1,500 were implemented. "Not surprisingly, sales were weak. Toyota sold 21,000 Corollas in February 2008 down 25% from a year earlier" (Shirouzu and Murphy 2009). ■ Toyota receives reports of a sticking gas pedal problem in December 2008 (Kanter, Maynard, and Tabuchi 2010). No corrective action is taken.
2009	■ In April, Toyota warns engineers in the U.S. of a sticky gas pedal problem it had previously identified in December of 2008. No action was taken (Maynard 2010). ■ Toyota Motor Corporation names Akio Toyoda as its new president on June 23, 2009. Along with Toyoda, Toyota names a new management team that includes four new executive vice presidents and eight new board members. "In a move seen as an attempt to balance the newly promoted with seasoned veterans, Toyota brings back Yoshimi Inaba, an outspoken heavyweight who left as executive vice president in 2007 to head an airport that Toyota helped build. Inaba returns as a director and will take charge of Toyota's North American *Continued ...*

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010 (continued)

Year	Event
2009 cont'd	operations, the company's largest and, until recently, most profitable market. Inaba, fluent in English, headed Toyota Motor Sales U.S.A., the California-based sales arm, from 1999 to 2003" (Kubo and Kim 2009). ■ In July, a presentation of achievements was made by Toyota staff to Yoshimi Inaba, Executive Vice President, Member of the Board and Chief Officer of the North America Operations Group. On a slide entitled, "Wins for Toyota -- Safety Group," U.S. Toyota executive's "boasted of saving hundreds of millions of dollars by getting the federal highway safety regulators to limit the scope of recalls" for floor mats in some Toyota and Lexus vehicles (Maynard 2010; CNBC 2010). The floor mats could cause unintended acceleration (Valdes-Dapena 2010). In 2010 testimony, Mr. Inaba tacitly admitted that he was briefed on the Safety Group's success when he stated that he could not remember the meeting where he was briefed on the memo "with any depth" (Bensinger and Vartabedian 2010). Other "wins for Toyota" lauded in the same presentation were a savings of $124 million reaped by winning a phase-in to new safety regulations for side air bags and an $11 million savings reaped by delaying a rule for tougher door locks (Thomas 2010). Also credited as wins were: "'Avoided investigation on Tacoma rust' and helping win delays in various new federal safety regulations" (Valdes-Dapena 2010). In response to the facts of this presentation, a Toyota spokesperson said, "Our first priority is the safety of our customers and to conclude otherwise on the basis of one internal presentation is wrong. Our values have always been to put the customer first and ensure the highest levels of safety and quality" (Thomas 2010). The conflict between the facts of this internal presentation and the spokesperson's assertions were not explained. No one asked how, given this unassailable ethic, such a presentation could made to an executive officer and member of the board of Toyota (Yoshimi Inaba) without the least concern for reprimand for being unaligned with Toyota's "first priority." ■ "In August, the month following the presentation of "Safety Wins" in which the executive boasted of saving $100 million over a full recall, a family of four was killed in a Lexus with its gas pedal stuck under a floor mat" (Valdes-Dapena 2010). ■ In September, "Toyota told dealers in European countries that it was changing the way it would build cars sold there, and outlined the repair procedures the dealers should follow in the event of sticking gas pedals, sudden engine surges or unexpected acceleration" (Maynard 2010). ■ On Oct. 7, five days after an email exchange between Transport Canada and Toyota, the Canadian equivalent to the U.S.'s NHTSA, Toyota issued a massive recall that included Camrys, Corollas and Highlanders, because of problems with sliding floor mats potentially jamming the gas pedals (McKie 2010). In the U.S., however, Toyota stalled implementing a recall claiming to the NHTSA that it needed time to pin down the cause of the problem and devise an appropriate fix. Given its action in Canada, this was not true. Nonetheless, it convinced the NHTSA to allow it to just issue a safety advisory to owners to remove the floor mats (Maynard 2010). *Continued ...*

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010 (continued)

Year	Event
2009 cont'd	■ Ignorant of the Canadian recall, NHTSA'S spokesperson, Rae Tyson, expresses sympathy for Toyota's position stating, "I think Toyota is going to have a challenge on its hands to come up with a remedy that is going to address the problem" (Krisher and Strumpf 2009). Mr. Tyson sympathy seemed misplaced since Toyota had a solution that it had already implemented in Canada. The company chose not to correct Mr. Tyson's ignorance. ■ After three years of reductions in recalls, Toyota's worldwide automobile recalls reach a new record level of over 7 million cars. The Toyota brand drops to sixth place in quality rankings by new car owners. Its Lexus brand falls from top position in the luxury car quality rankings to third behind Buick and Jaguar. ■ Toyota's sudden, unintended acceleration in various models reaches public attention.
2010	■ In a January email message to another Toyota staff member, Irving A. Miller, then a group vice president for Toyota Motor Sales USA, states, "I hate to break this to you, but we have a tendency for mechanical failure in accelerator pedals of a certain manufacturer on certain models." He adds, "The time to hide on this one is over. We need to come clean" (Maynard 2010). His recommendation for 'truth saying' *now* suggests that 'hiding' was okay in the past. No mention is made of the duty owed to customers. Also, no clarification is made as to whether it remains okay to "hide" on other issues, if secrecy can be sustained. ■ On January 16, Toyota informs the NHTSA that some of its models may have a sticking gas pedal problem. Three days later, in a face-to-face meeting, Toyota executives claim that it was the first time they were aware of the problem (Maynard 2010). [Note that documents reveal that Toyota was first aware of the problem in December 2008.] ■ On January 21, Toyota orders a recall for the pedal problem, but states that it does not yet have an answer as to how to fix it. In response to why the recall took so long to occur despite hundreds of complaints, Toyota stated that it had only discovered the gas pedal problem in October of 2009. Later, Toyota testifies in a Congressional committee meeting on January 27 that it "first learned of this problem through reports of sticking pedals in vehicles in England and Ireland in the spring of 2009." This statement also proved inaccurate as Toyota later acknowledged it had received reports of the problem "as early as December 2008" (Kanter, Maynard, and Tabuchi 2010). On January 28, Toyota announces its fix. *It is the same fix it applied in Canada three months earlier* (Maynard 2010). ■ Toyota stops production and sales of eight models for the gas pedal problem (RAV4, Highlander, Sequoia, Corolla, Camry, Avalon, Matrix, and Tundra trucks). The eight models represent 65% of the sales of Toyota vehicles in the U.S. and almost half the sales of the Toyota Motor Corporation (Mufson and Haynes 2010). *Continued ...*

Exhibit A1. Toyota's Executive Actions and Related Events 1995–2010 (continued)

Year	Event
2010 cont'd	■ In February, James E. Lentz III, Toyota Motor Sales U.S.A's chief operating officer, reports that he did not know of the sticky gas pedal problem until January 2010. He is not asked about documented evidence that engineers in the U.S. were warned about the pedal problem in December 2008 (Maynard 2010; Mufson and Haynes 2010). ■ Also in February, Shinichi Sasaki, Toyota's vice president for quality, acknowledges three sources for Toyota's quality problems—lack of thoroughness of testing of new cars and car parts; failure to gather information from customer complaints, specifically their complaints about new cars; and failure to analyze and act on customer complaints (Harden, 2010). No mention is made of the effects of the cost reduction drives of the three previous CEOs on executive decision-making with regard to modifying design processes, engineering staffing and development, executive incentives, the push to kakushin, the failure to problem solve the 8-year increase in recalls, or other related actions and non-actions. No one asks how the problem of gathering customer complaint information could exist given Toyota's promise in 2006 to build a database specifically to correct this problem (Maynard and Fackler 2006). ■ In December, NHTSA fines Toyota 32.425 million dollars, the maximum fine allowable, for its poor response to safety issues (U.S. Department of Transportation 2010). Prior to the fine, Transportation Secretary Ray LaHood repeatedly calls Toyota "safety deaf" (Maynard 2010). In his announcement that Department of Transportation was seeking maximum civil penalties, La Hood states, "We now have proof that Toyota failed to live up to its legal obligations. Worse yet, they knowingly hid a dangerous defect for months from U.S. officials and did not take action to protect millions of drivers and their families. For those reasons, we are seeking the maximum penalty possible under current laws" (U.S. Department of Transportation 2010a). ■ Gordon (2014) reports that Toyota admitted that it redesigned critical parts related to its sticky gas pedal problem "without changing the part numbers." Correct practice is to change a part's number whenever it is retooled. Gordon further reports that "Toyota admitted in documents in its recent court settlement that it did so to prevent regulators from learning about a problem with 'sticky' gas pedals." As well, that step "made it more difficult for ... private litigants to identify the problem." ■ In an apparent confirmation of the direction the three nonfamily CEOs took Toyota and their continued contempt for Akio Toyoda, they are reported to say that "Mr. Toyoda never publicly opposed their profit-growth strategy when the company was widely praised for making big money and surpassing General Motors Corporation to become the world's No. 1 auto maker." Hiroshi Okuda, in particular, "has told at least two associates since the recalls of cars involved in sudden acceleration incidents earlier this year: 'Akio needs to go'" (Shirouzu, 2010). None of these former leaders of Toyota ever uttered a statement that came close to acknowledging how grievous a violation of the supposed "Toyota Way" were the actions taken under their direction of the company.

One of the central rubrics of lean management guidance is that managers should always act from a basis of knowledge (Ballé 2009; Emiliani 1998, 2006; Shook, 2010). The knowledge that underpins the management of a lean enterprise has several components. The central component is the Lean model's assumptions about the nature of people. The reasons for this should be clear. Such organizations are engaged in commerce—*the exchange of resources between people*. This exchange is both a personal *and* social event. At a personal level, each individual decides whether to engage in commerce and to what end. Each person decides what he or she will exchange, with whom, and under what circumstances. At the social level, people must connect with potential partners in commerce, engage them in considering an exchange of resources, and involve them in making that exchange. Prior to that moment, people must shape their offering and its presentation so that it addresses the values and needs customers seek it to satisfy. All of these issues and more are recognized as important within Lean thinking.

Consider our notion of the extended value stream. In a real sense, it represents the cluster of social activities that create and maintain a cooperative enterprise such as a modern business. Included in this "cluster of social activities" are the interactions that occur within and between every group that contributes to the ultimate exchange between a business and its customers. As just a few examples, consider the commerce that occurs between an organization and (a) its employees concerning their employment, (b) its suppliers concerning ordering and receiving their needed inputs, (c) its governmental regulators concerning compliance with regulations and license to operate, and (d) any other entity from which the business needs something.

Thus, every significant facet of commerce is both an expression of our nature as people *and* a behavior calculated based on our understanding of what people's nature is. Any guidance for conducting commerce, therefore, must be founded on one's understanding about that nature.

What Is Lean Thinking's Understanding of People?

Little content in the Lean literature directly addresses the issue of Lean's view of people. Yet, Lean thinking's understanding of human nature is the knowledge foundation that underpins its Lean management guidance. In its current state, Lean management's guidance is essentially a set of rubrics that clarify what one should do and how one should behave. "Strive for perfection in all operations" and "Respect people" are two examples. A model's understanding of people's motives, inclinations, values, and goals explain the "why" beneath the rubrics. It is what allows a Lean manager to act from a basis of knowledge, not imitation. The question is: "Can one extract from these rubrics about Lean's view of the nature of people?" Can one derive from them the "why" beneath the behavioral guidance? Our conclusion is that, except in the few instances where a Lean writer specifically addresses people's nature, you cannot.

Appendix B: Why Lean Management's Rubrics Cannot Tell Us What Lean's View of People Is 40

The Problem

The Lean literature's guidance for managers derives from the practices observed within the Toyota Motor Company or the teachings of one or another former Toyota manager or supervisor. They are documented in the works of Emiliani (2007, 2007a, 2008), Imai (1986, 1997), Liker (2004), Liker and Convis (2011), Liker and Hoseus (2008), Liker and Meier (2007), Rother (2009), Shook (2010, 2011, 2013, 2013a, 2013b, 2014), and Womack (2006, 2009, 2009a), and Womack and Jones (2003) among others.

As presented in these writings, Lean's management rubrics are clear and consistent. They represent "do's and don'ts" that Lean managers should follow as they work with people in implementing a Lean enterprise. For example, Lean managers should elicit people's ideas for improving business operations and support them in acting on those ideas so that the business improves continuously. They should enable people's success in performing their roles by providing them guidance through visual knowledge displays that remind them of the flow of work and information displays that tell them the status of the operations they are implementing. They should recognize people for their growth and improvement in the mastery of processes and not simply focus on their result outcomes. They should empower people to prevent failures by installing devices like andon cords so they can stop errant operations immediately—on their own authority.

One might surmise that these and other Lean management rubrics suggest people can think rationally. They could reasonably suggest that people can align their thinking and doing with an organization's purpose and make decisions that advance that purpose. The rubrics might also imply that people act responsibly when given the latitude to take actions that can significantly affect business operations. It might seem that the rubrics all presume that people can develop ideas that improve the value of processes and products and acquire and use learning from their own experience and from others. But, these judgments are all *possibilities* as to the deeper understanding that underpins the Lean management rubrics. Lean management literature does not state explicitly what the capabilities of people. It does not tell us at all about its assumptions about the motive, inclinations, values, and other features that form human nature, affect human commerce, and decide whether, how, and under what conditions people will work together for a common aim.

Indeed, while Lean management's rubrics can stimulate thinking about human nature, their implications for the fundamental nature of people are almost always *equivocal*. Fundamentally, the rubrics tell a manager how to behave so that he or she replicates the manner of performance exhibited by people who presumably exemplify the Lean approach to commerce. They do not express the underlying thinking about human beings that explains why the rubrics are essential.

On the one hand, this is understandable given that the guidance is derived from behavior observations or reports instructional points passed down from elders. On the other hand, it is odd

because one of the important rubrics of Lean management is that all contributors should challenge the "given" by asking the "Why?" question (Womack 2009a). The 'Why?' question, when repeatedly asked, progressively develops a deeper understanding of the causes and significance of observed behaviors. This knowledge enables one to properly assess the utility of what one is being directed to be do and offer suggestions or enhancements to current methods and guidance.

If the 'why' t had been asked of the people from whom these management rubrics were received, they might have revealed Lean's thinking about people. Absent that exercise, we do not know the understanding about people that generated these rubrics. We lack the knowledge that underpins them and should guide their application. We just know that they are deemed essential to do. And, with this fact, we violate another Lean management rubric. That rubric asserts that Lean managers should always act from a base of knowledge (Shook 2010e, 2013a).

An Example of "Equivocal" Meaning

One cornerstone rubric in Lean management is that people must be treated with respect (Ballé 2015; Baudin 2013; Emiliani 2008, 2009; Shook 2011; Liker and Hoseus 2008; and many others). But why? It is said by Shook that "We respect people because we believe it's the right thing to do and simply because it makes good business sense" (Shook 2011). While we are personally comfortable with the first part of this statement ("it's the right thing to do"), neither it nor the second part—that it "makes good business sense"—provides a precise insight into Lean's view of the nature of people.

From the first part ("it's the right thing to do"), one might infer that people in general or Lean commerce implementers in specific are naturally inclined to respect other people and thus carry a fundamental conviction about its "rightness." But such a conclusion flies in the face of having to make 'respecting others' a Lean management rule. That statement, as a mandate, is more consistent with the findings across decades of survey data reporting how employees feel they are typically treated by their workplace superiors. Commonly, only a minority of employees report feeling respected by their bosses.[1]

Also, if this "rule" about respecting people were just an affirmation of an inner sense of right and wrong, why present the rational that "it makes good business sense"? While research supports that assertion (Harter, Schmidt, and Killham 2003; Harter, Schmidt, Agrawal, and Plowman 2013; Porath 2014), the statement itself suggests that the reason we should treat others with respect is *utilitarian* in nature. It implies that people will provide us more of what we want if we show them respect. That implications supports two other inferences that conflict with each other. The first is that people value being respected and will reciprocate by offering value in return. This assertion is consistent with the empirically supported principle of reciprocity (Coyle-Shapiro and Kessler 2002; Diekman 2004; Dolivo and Taborsky 2012; Wickham and Hall 2012). The second

[1] See Porath (2014) for a recent assessment of whether employees feel respected by their bosses. She reports that a worldwide survey conducted by Harvard Business Review found that "over half (54%) of employees claimed that they don't regularly get respect from their leaders."

possible inference is that people in general or managers in specific operate from self-interest. They take an action in order to gain a benefit they seek. The "self interest" part is suggested by the *quid pro quo* nature of the reasoning for management offering employees respect—namely, that they will get more or better outcomes from them. If that is true, the offering of respect is a mere instrumentality to an end. "I behave in this way to get from you what I want." This leads to a paradox. Respect involves recognizing and genuinely valuing some personal quality in another. Its expression honors the presence of that valued quality in the other. It has no other purpose. It is not a manipulative act. Indeed, manipulative acts are commonly experienced as insincere and *disrespectful*.

Historically, there is a reasonable basis for thinking that the edict to respect people is utilitarian at its roots. Certainly, Toyota's shift in its treatment of employees post strike in 1950 seems utilitarian based. As Shimokawa and Fujimoto (2009) indicate, Toyota's cooperative labor-management strategy was triggered by a significant rise in demand for vehicles by the U.S. Army to wage its war in Korea. Toyota needed to ramp up its workforce. After World War II, however, the Toyota workforce created its own labor union. Before the war, all industry labor unions were company sponsored and company controlled. By 1950, despite the repressive efforts of the U.S. Army,[2] unions did emerge somewhat free of company control and represented a force Japanese management needed to address should there be an increased need for workers. And there was for Toyota a dramatic increase in orders for vehicles by the U.S. Army thanks to the Korean War. Faced with escalating demand, a need for workers, an unhappy workforce, an independent union, and a labor strike—Toyota adopted a cooperative approach to labor management relations.

Even the 1962 Joint Declaration of Labor and Management (Toyota Motor Company 1962) anchors itself in economic necessity. In that instance, it was the challenge of meeting the added competition that the approaching passenger car trade liberalization would usher in. That declaration tells us nothing about the nature of people. It just clarifies what Toyota would provide its employees in order to get them to commit to fulfilling Toyota's needs—a straightforward example of *quid pro quo* behavior.

The 2003 Toyota statement of Relations with Employees (Toyota Motor Company 2007) emphasizes the "win-win" benefits of mutual trust and respect and employee investment in self improvement. For employees, it promises "long-term employment," "stability in their lives," and "opportunities for self-realization and growth." For the company it promises better business outcomes and "corporate development." Again, this suggests a utilitarian rational for the management rubric of "respect for people" not some native appreciation for the inherent value of each person or a rooted experience of affinity for others.

[2] In 1947, General Douglas MacArthur, the U.S. Supreme Commander of the Allied Powers (SCAP) instituted a "reverse course" that undid earlier liberalization of worker rights to form unions and union rights to bargain for labor's goals. "The first salvo involved MacArthur banning a general strike that had been called for 1 February 1947. This signaled the beginning of the end for the radical union movement as SCAP withdrew its support and encouraged the union-busting tactics of Japanese corporations and the government" (Xiaohua 2010. p. 13). See also, Chomsky (1991) and Dower (1999).

If we turn to the famed "The Toyota Way 2001" document for deeper clarification, we will apparently be disappointed. According to Baudin (2013), that document does not provide any deeper understanding for the edict, "respect for people." While the document is closely held by the company, Baudin was provided the opportunity to read it. He states, "As a stand-alone document ... it's not that useful ... . Based on its content alone, it would be difficult to tell the Toyota Way apart from other corporate philosophies like the HP [Hewlitt-Packard] way. A manager of a mid-size traditional plant, reading The Toyota Way 2001, would reasonably conclude that all he or she needed to do to emulate Toyota was follow its recommendations."

Further obscuring Toyota's underlying thinking about human nature, is Eiji Toyoda's comments that no new understanding of people was involved in its 1950 shift in management-employee relations (see Shimokawa and Fujimoto, 2009, pages 242–45). Indeed, he saw it as simply formalizing what had been Toyota's prior commitment to labor-management cooperative relations. Historical facts do not support that position. They suggest that historically Toyota applied a Taylor-oriented management perspective. More to the point, Eiji Toyoda shares no deeper perspective about the nature of people that would explain the company's shift from its essentially a Taylor-orient management perspective toward workers to what we understand to be the Lean perspective. Indeed, he simply states, "we formalized our perspective in the labor management declaration. We etched that commitment in a stone memorial on some anniversary of the declaration. That's about all there is to say. We put it in writing on a stone monument in front of the entrance to our headquarters" (Shimokawa and Fujimoto, 2009, pp. 243–44).

While Eiji Toyota's statements are meant to suggest that Toyota's behavior toward it workers did not change, we believe it did. We simply cannot find in the statements made by the Toyota Motor Company any explanation for the change in terms of some new or renewed understanding of who people are.

Be clear, the above analysis is not meant to imply any insincerity in Toyota management's "respect for people." It is intended to clarify that from the "respect for people" edict itself, one cannot definitively deduce the "why" behind the edict. It provides us no certain insight into either company's view of human nature or the Lean model's view.

Bottom Line

Based on our analysis of Lean management's rubrics, our conclusion is that you cannot confidently reason backwards from rubrics to assumptions about people's nature. This should not be unexpected as backward reasoning using either modus tolens (with formal knowledge systems) or abduction (with observationally-based knowledge systems) always produces uncertain conclusions. Using Modus tolens as your inferencing principle, for example, requires an absolute relationship between an antecedent and its consequent. However, this only generates a certain conclusion when there exists either one possible antecedent or one inclusive set of antecedents all of which must be true. If there are many independent antecedents, then reasoning backward

cannot generate a certain solution. For example, an absolute rule might be "If A and B and C are true, then D is true." Given such a rule, modus tolens will generate a correct inference. That is, if D is true, then so too are A, B, and C. It will not, however, generate a correct conclusion given the following rule: "If A or B or C is true, then D is true." In this case, if we find "D" to be true, we know that at least one of the antecedents is true but not which one. As to abduction, it only generates possible conclusions and never certain ones. If it akin to statistical inferencing: "Given that we observe with great frequency X occurring prior to D occurring, if we see D then it is likely that X occurred."

Unequivocal Assertions About the Nature of People

We have found a few instances where a Lean writer speaks directly to the nature of people. In his essay, *The Essence of Developing People and Yourself*, Shook (2014) asserts that "Individuals seek challenges." He also states that it is through challenges that "unending development comes" (Shook, 2014). While he does not explicitly state that people seek unending development, this would be a reasonable, if uncertain, inference. This conclusion is further supported by Shook's endorsement of Mihaly Csikszentmihalyi's theory about the human experience of "flow".[3] Csikszentmihalyi defines the state of flow as, "being completely involved in an activity for its own sake. The ego falls away. Time flies. Every action, movement, and thought follows inevitably from the previous one, like playing jazz. Your whole being is involved, and you're using your skills to the utmost" (Geirland 1996).

The "flow" experience is similar in nature to the management construct of engagement, but it incorporates added elements. For example, "The flow state is an optimal state of intrinsic motivation, where the person is fully immersed in what he is doing" (Mihaly Csikszentmihalyi 2016). The construct of engagement does not incorporate the notion of intrinsic motivation. Essentially Csikszentmihalyi's theory asserts that individuals are transformed through active involvement in modifying themselves and their situations so that they achieve greater success in what they are attempting to accomplish. The flow experience emerges at the point where a person undertakes the maximum level of challenge his or her skills can resolve. The growth that emerges from that experience raises both the level of challenge the person can undertake and the person's skills and proficiencies in dealing with it. Thus, it creates the opportunity for renewed flow experiences which, indeed, the person pursues.

Shook, however, is conditional as regards people's natural inclination to learn, which seems at odds with his notion that people seek challenges and development, and his endorsement of Csikszentmihalyi's theory. He states that some people have within them a "searching for more, for more challenges, for more learning. A hunger for learning and to make things better" (Shook, 2014). When his endorsement of Csikszentmihalyi's theory and this latter quoted statement are

[3] Csikszentmihalyi's construct of "flow" has *nothing* to do with the Lean construct of flow in processes. Csikszentmihalyi's construct concerns human phenomenology, not explicit instrumental processes.

juxtaposed, it becomes uncertain what his position is on the fundamental nature of people. This, again, is not a criticism of Shook. His main purpose in these writings is to instruct Lean managers in the way they should behave and not the knowledge about from which his guidance ultimately derives. And, for Shook and all other writers about Lean management, their guidance is instrumentally focused—i.e., 'to be a Lean manager, you need to do this and behave this way.' Which is consistent with its origins in observing the actions of others.

The Lean Model's Missing Assumptions About The Nature of People

Our conclusion from our analysis of the Lean management literature is that it does not contain a description of the assumptions about people that explain the rational basis for its guidance. Yet, such a source exists within its historical development. That source is the writings of W. Edwards Deming. Deming did indeed represent a coherent perspective about the nature of people. It is one of the four domains of "profound knowledge" that Deming declares managers must master because they are the "why" behind all management decision making and actions (Deming 2000; Vitalo 2017). These four domains of knowledge are:

- a theory of organization (the nature of systems),
- the concept of variation and its significance,
- a theory of knowledge, and
- the basic principles that reveal the nature of people and the source of their striving.

Should the Lean community seek to develop its fundamental premises about the nature of people, human organizations, and commerce itself, Deming's thinking would be the place to start.

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