PROJECT CONCLUSIONS: TOWARD IMPROVING THE LEAN ENTERPRISE MODEL

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The Lean Enterprise model is a business improvement methodology and, for some, it is a comprehensive and strategic approach to conducting a commercial enterprise.

James Womack and his colleagues derived the approach from the findings of their study of the Toyota Motor Company and other Japanese companies. They compared the more successful methods that these companies employed to the approaches used by a wide array of automotive manufacturing companies around the world. The study was implemented in 1985 by the International Motor Vehicle Program located in the Center for Technology, Policy, and Industrial Development at the Massachusetts Institute of Technology. Its goal was to enable automobile manufacturers worldwide to advance the prosperity of their host countries and improve the work life of industry employees by transferring knowledge of the more competitive approaches implemented by Japanese companies such as Toyota. The study lasted five years, had 36 sponsoring governmental and industry organizations, produced 116 scholarly publications, and culminated in the publication of *The Machine That Changed the World* (Womack, Jones, and Roos, 1991). It introduced the term "lean production" to characterize Toyota's manufacturing strategy (i.e., the Toyota Production System or TPS) and contrasted it with "mass production," which was the norm.

Absent from that work was the recognition of W. Edwards Deming's contribution to Toyota's success (Nemoto, 2009). Our research indicates that Deming's teaching was, in fact, the foundation of the Toyota Motor Corporation's success during the period of its emergence as an exemplary global automotive manufacturing company (circa 1960–1990). Indeed, Dr. Shoichiro Toyoda, the son of the founder of the Toyota Motor Corporation and its chairman from 1992 to 1999, acknowledged this fact. "Everyday I think about what he [Deming] meant to us," said Dr. Toyoda; "Deming is the core of our management" (Burns, 2008). Nonetheless, Deming's role with regard to Lean Enterprise is largely unrecognized, and its incorporation of his teaching is quite limited.

Over the decade and a half following the introduction of Lean Manufacturing, the Lean production model was refined and elaborated into "Lean thinking." Its

guidance was applied to a wide variety of commercial enterprises, including both manufacturing and nonmanufacturing businesses. During this period, its authors expanded Lean thinking's guidance by incorporating their understanding of additional elements of Toyota's strategic perspective and operating methods. Despite the model's expansion of perspective, in practice, the main focus of Lean Enterprise has always been on business operations.

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. The histories of companies applying Lean thinking including Wiremold (Emiliani, 2007), Danaher (DeLuzio, 2019), and, most recently, General Electric (Kellner, 2020), attest to the benefits it can deliver, as well as the outcomes produced by Kaizen improvement events (see, for example, Bujak and Vecellio, 2014; Reed, 2004; Vitalo, 2005; Vitalo and Guy, 2004; Vitalo and Lowery, 2003).

Problems in Applying the Lean Enterprise Model

As the lead-in sentence of the last paragraph suggests, the uses to which the methods of Lean Enterprise are applied vary considerably and, with that variation, so do its results. This variation in understanding about what the purpose of Lean Enterprise is, as viewed by Lean community members, is but one of the problems that limit the utility of the Lean Enterprise model. This project explored this and other problems related to applying the Lean Enterprise model and the possibility of remedying them. The issues addressed included

- conflicting perspectives across the Lean community about the ultimate end a Lean Enterprise pursues,
- inconsistencies in the operational definitions of key Lean terms,
- gaps in the knowledge needed to know the "Why" behind the elements of Lean thinking, and
- the obstacles to resolving Lean's problems in an authoritative way.

What is the Aim of a Lean Enterprise?

What is the ultimate goal of applying Lean thinking? As reported in our technical paper, *The Missing Pieces in the Lean Enterprise Model* (Vitalo and Bujak, 2019), our research uncovered disagreement among Lean community members about the ultimate purpose Lean serves. While members disagreed in their

answers, everyone spoke with confidence, and all appeared to anchor their responses in their personal experiences, training, and readings.

At least a third of community members stated that Lean is all about "efficiency and cost reduction" with the intent of maximizing profitability for a company. Such thinking can find a referent in Taichi Ohno's statements that "the most important objective of the Toyota system has been to increase production efficiency by consistently and thoroughly eliminating waste" 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" (Ohno, 1988, page 53).

Another portion of Lean community members saw Lean aim as continuous improvement with a focus on applying Lean tools (e.g., 6S, Kaizen, TPM) to accomplish this end. They saw the work of Lean as uncovering and eliminating waste as it appears in work processes and as a result of features of a work setting. Waste consumes resources but does not produce a customer benefit or it creates safety hazards that endanger workers.

A final segment of community members saw Lean's as a strategic approach to managing a business. Their minds focused on the extended value stream and saw Lean Enterprise as a cooperative effort that integrated the contributions of all stakeholders in an effort to maximize the delivery of value to customers. They also saw it as including a different approach to leading and involving people, one that recognizes the knowledge and creativity of workers. In their thinking, the Lean approach emphasized the importance of engaging people's minds, aligning their efforts to the purpose of maximizing the delivery of value to customers, developing people's knowledge and skills, and providing them opportunities to contribute to improving their business and sharing in the benefits they generate.

As stated above, members of each of these segments spoke with confidence about their understanding of Lean. Mark Graban (2007), for example, has such confidence in his understanding that he feels able to judge which applications of Lean are genuine and which were what he has termed, L.A.M.E ("Lean as Misguidedly Implemented"). Yet, it was other Lean community members, acting with equal confidence to his, that implemented the projects he labeled L.A.M.E.

The confusion implied by these different perspectives was confirmed by the findings of a survey implemented by Womack (Womack, 2010). 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 significance of this definitional problem seems poorly grasped by Lean community members. A set of ideas coheres into a system *only* when they are organized around a single aim. The aim of each system determines the relevance of each component within it and the role 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. 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. Consequently, "Lean thinking" becomes a label for a set of tools and activities applied by different people, in different ways, and for different purposes.

Inconsistencies in the Operational Definitions of Key Lean Metrics

Apart from the confusion about Lean's ultimate goal, there is also confusion at the detailed level within Lean thinking. Metrics, such as value-added ratio, cycle time, lead time, throughput time, and processing time are central to applying Lean methods and gauging the elimination of waste, an important Lean objective. Yet, the operational definitions of these terms vary (Vitalo, 2014). For the sake of brevity, this report will focus here on the value-added ratio and cycle time. Vitalo (2014) discussed in detail the problems with the remaining metrics listed above.

The value-added ratio reflects the percentage of work time spent on activities that materially change an output in ways the customer values (termed "value-adding time). Based on my past studies, I assumed that the ingredients used to compute the VAR were cycle time and value-adding time. At least one important primary source in Lean literature, however, uses *lead time not cycle time* in its computation of VAR (Jones and Womack, 2009). The two documented methods do not produce the same result. This discovery triggered a further investigation of the other elements used to compute VAR. The first metric Vitalo (2014) checked was cycle time.

We never had any doubt about cycle time's meaning or how to measure it until Vitalo's research report (2014). What he found was that there is no standard definition of what cycle time refers to or how to measure it. For example, Rather and Shook (1999, p. 19) state that cycle time is "the time that elapses between one part coming out of the process to the next part." That definition is easy to envision. For example, stand at the end of a process, detect the exist of an output, start the timer, detect the exit of the next output, and stop the timer. Later in the same

work, however, they also define cycle time as "the time it takes an operator to go through all of their [sic] work elements before repeating them" (ibid, p. 21). Unfortunately, these definitions *do not* necessarily coincide.

Using Rather and Shook's first definition of cycle time, one measures the time interval between the emergence of Output A and Output B. The result includes all the time expended by all the activities that shape that product as it passes through *the critical path of a process*. The critical path of a process is the sequence of activities that determine *the minimal time* an output can be generated by the process. It is only time spent on the critical path that affects the interval between outputs exiting a process. Thus, it does not reflect all the people or machine operating time expended in the process since some of this may be done in parallel and, therefore, occur "*off the critical path*."

Using Rather and Shook's second definition, one's focus for calculating cycle time is the time spent by people doing work. As just stated, not all work within a process is on its critical path. Applying this second formulation, one would measure work done on the critical path *and* off the critical path in subprocesses that are implemented in parallel. The cycle time computed by this method would be much greater than the cycle time as computed by the first definition. Also, if we strictly apply the phrase "time spent by people doing work," it would mean that we would not include unattended machine operations, however, that time would be included in Rather and Shook's first definition of cycle time.

Gaps in the Knowledge Needed to Know the "Why" Behind the Elements of Lean Thinking

While not crediting W. Edwards Deming for this principle, Lean thinking embraces Deming's assertion that decision making should be guided by knowledge not tradition or the imitation of others. Complex systems, such as commercial organizations, are destabilized when people take action without a fundamental understanding of the dynamics that control the system's performance (Deming. 2000; Forrester, 2010). Our research uncovered a number of key decision-making areas where definitive knowledge for guiding decision makers was lacking. These included lack of knowledge to guide one in

- discriminating the ends served and controlling values that should determine the application of Lean tools in specific, but common, circumstances;
- determining how certain executive functions should be implemented; and
- explaining the "why" behind Lean management rubrics.

By "definitive knowledge," we mean a set of authoritative concepts and principles expressed, 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 and the organization of work areas. 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 suggests (Bainbridge, 2012; Friedman, 1970)? Should some of it be put at risk by applying it to discovering better ways to meet customer needs? If so, how does one assess the amount of profit to apply? Should the increased profits produced by reduced costs at current prices be shared with employees, returned to customers, or both? Who decides such issues and what guidance does one use to decide these questions?

As an example of another decision about which clarity is lacking: Can one properly apply Lean tools to downsizing a company? This certainly has been done. If you say "Yes," then 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).

Similarly, should one use Lean tools to drive cost reduction *solely* for the purposes of increasing 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? Case law has repeatedly asserted that the responsibility of commercial corporations is to maximize profits for their shareholders.[1] Achieving this end has been the main interest of every Fortune 500 business with which we have worked despite what their public speech about their purpose, vision, and core values asserts. 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, not sharing them. Given Emiliani's position, can any capitalist

[1] For example, see Dodge v. Ford Motor Co. 170 N.W. 668 (Mich. 1919).

enterprise whose commercial model defines the purpose of commerce as maximizing the producer's profits (see below) be a Lean enterprise?

The above are just a sample of the decisions one faces in "properly" applying Lean methods. And, in our research of a wide number of such decisions Vitalo and Bujak, 2019), 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 organization 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 efforts among all contributors. Most of the tools we were developing were targeted to enable the performance of executive functions. Below, we discuss the gaps we found in Lean guidance on how to implement four executive activities.

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; the stakeholders the enterprise recognizes; and what kind of relationship it will develop 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 tells what the business will produce for exchange, with whom, where, and why.

Lean thinking provides little guidance concerning what answers to these various business intent questions are consistent with being a Lean enterprise. 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? 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 defines the relationship between a producer-focused, profit-driven enterprise and its customers also appropriate for a Lean enterprise?

And what is Lean's understanding of *profit*? Is profit *only* money acquired that exceeds costs? Is it money at all? Do monetary gains, in themselves, advance the purpose of a Lean enterprise or does its utility depend on how it is used?[2] Is learning profit? Is having better skilled contributors as a result of an organization's development efforts profit? Given our image of Lean enterprise, we answered these questions as follows. Profit is a any gain that directly advances the purpose of an enterprise. Monetary profit, in itself, does not advance the purpose of a Lean enterprise. Only when surplus money is applied to improving the value-adding capability of an enterprise does it have value within the context of the Lean Enterprise model. We also concluded that developing and applying learning that improves the value-adding performance of the enterprise *is* profit. So too is the result of having more skilled contributors generating greater value-adding outputs profit. But, based on our research, such a set of answers would generate much disagreement and, most relevant here, there is no body of authoritative knowledge within Lean thinking that one can use to resolve such disagreement.

Organizational Design

Organizations larger than a single work unit divide their work into subsets of operations with each subset having a more specific focus. 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 of boxes represents a more limited level of activity.

Organizational designers also specify who is accountable for each segment of the company's performance and what default communication path members should use. This task draws the solid or dotted lines that connect the boxes in an organization chart.

Finally, an organization's designer determines the social aspect of the organization by clarifying the basic role workers 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 a business measurement system capable of supporting learning from performance; the implementation of Lean's

[2] If challenging monetary gain as profit seems silly, recall the words of Henry Ford (1922), "Money cannot make anything and money cannot manage anything."

organization-wide, yearly planning and renewal process (Hoshin Kanri); and functional teaming within and across all work units and locations.

Realizing that these problems exist, we decided to develop a tool for reconceiving an organization's current design so that it enables the implementation of Lean practices. This purpose led to the question of how a Lean enterprise should be 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? How should they be managed? We could not find answers to these questions in our Lean literature research. 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.[3] But, this solution—despite its 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 discussing what competitive strategies a Lean enterprise may undertake. Certainly, one well-rooted notion is that a Lean enterprise should win customers by offering them superior value. Beyond that point, little to nothing is said about what other marketplace strategies a Lean enterprise should and should not use. 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 domination of the "big iron" mainframe computing market in the 1970s and 80s (Baase 1974; U.S. Department of Justice 1995). One technique it applied was "bundling." IBM "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

[3] 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. 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).

1974). Bill Gates' Microsoft Incorporated also used a control 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 these 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 approach that companies have used to maintain or reduce pricing shifts costs 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 of its product—i.e., 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.

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.[4] 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 this strategy 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

[4] See Exhibit A1 in *Why Toyota Is Not Lean Thinking's 'Rosetta Stone'* (Vitalo and Bujak, 2019) for a documented, detailed listing of these actions.

States caused by coal-burning power generating companies operating in the western states is an example of a negative externality. Companies implementing the dominant producer-focused, profit-maximizing approach to commerce seek to minimize negative externalities and maximize positive ones. When a negative externality exists, such producers take no responsibility for the costs required to remedy it nor the human harm it produces. Rather, they pass these costs on to society.[5] When a positive externality occurs—for example, when a pharmaceutical company is doing taxpayer funded research that yields a marketable drug—capitalist companies seek to keep for themselves all the monetary benefits that the "paid-for-by-the-taxpayer discovery" can generate. How should a Lean enterprise deal with externalities? What principles should guide its conduct? What is permissible and not permissible?[6]

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., corporations, limited liability companies, partnerships) 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, 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 that Toyota Motor Corporation uses to compensate employees. 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.

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[5] Milman (2019) reports on an effort 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?

[6] Some people might 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 already stated, the company's conduct has frequently varied from its public speech (Vitalo and Bujak, 2019).

Operationally, Toyota sets the pay for hourly wage workers using locale-specific market surveys. These surveys find a range of pay and Toyota attempts to either match the first or second best pay level found. 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 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. As an example of the former action, recall how major IT companies conspired to and succeeded in suppressing employee wages in the 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 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.[7] Such pay would reflect the actual yield of monetary 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."[8] 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 explicit assumptions about the nature of people and derivative principles from which the model's various ideas about commerce and the management of a commercial enterprise flow. All theories of commerce and business management are rooted in a set of premises about people. Commerce is the exchange of resources between people. Management actions engage, enable, support, and ensure the aligned and effective performance of people. A theory explaining how either unfolds is built on its understanding of people's motives, values, inclinations, and purposes. Deming (2000) referred to this set of knowledge as "psychology." It documents one's fundamental understanding of the nature of people and the factors that affect their behavior. This knowledge clarifies why people enter into commerce, what they seek to realize from it, how they will conduct commerce to achieve their purpose, how an organization is created and sustained, whether and how people can be aligned to a common goal, and whether and how one successfully engages, involves, and enables their successful performance.

The prevailing producer-focused, profit-maximizing approach to commerce, for example, is based on a set of explicit assumptions about human motivation and the end people pursue when interacting with others. Its view of people's nature is that they are radically individualistic and driven to maximize their personal

[7] This calculation could be refined to subtract from the value produced whatever costs the producer incurred to support the worker in producing that value.

[8] 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.

gains from every exchange with others. It further assumes that they rationally pursue this end without regard for the impact of their decisions and on others (Hubel, 2014; Yamagishi, Takagishi, Matsumoto, and Kiyonari 2014). From these assumptions, the model deduces that people will only engage with others to satisfy a need or want. If taking is not an option, then they will engage with others on a *quid pro quo* basis and always with the intent of getting more than he or she gives. Given people's inherently selfish purposes, each person must look out for his or her own interests.

Based on this thinking, people only join an organization to acquire some externally supplied personal gain, usually, but not necessarily, money. Thus, management should recruit employees by using external incentives or persuasion, and do it at the least cost to the organization (Barnard, 1968). Further managers must control employees through active supervision to obtain from them the performance the business seeks, since the intrinsic direction of employees is to pursue their own interest, not the employer's interest. And, given that all people seek to maximize their receipt of benefits from every exchange, they will be inclined to do the least work to obtain the most gain they can realize (Hubel, 2014).

What are Lean Enterprise's assumptions about people's nature? How does Lean thinking replace this producer-focused, profit-maximizing set of assumptions? We could not find any clear and consistent answers to those questions.

Insurmountable Obstacles to Resolving Lean's Problems

We finished our book about the Lean Enterprise model detailing how to design, construct, and manage a Lean enterprise and succeed in Lean commerce before we appreciated the above described problems. We had closed each knowledge gap by reasoning from our understanding of what Lean Enterprise was about and drawing on the works of W. Edwards Deming. At that point, the question we needed to answer was whether we could confirm that what we had written truly represented the "Lean Enterprise Model." When we could not find explicit confirmation of what we wrote, we considered the following options:

- Derive Lean's assumptions about the nature of people by backward reasoning from its management rubrics.
- Use Toyota as Lean's Rosetta Stone to formulate Lean's missing knowledge and verify the basic principles that explain the "why" underlying Lean thinking.
- Convene a type of "loya jirga" to close the gaps in Lean thinking and complete its knowledge base.

Fundamental Knowledge Not Derivable from Lean Management Rubrics

We investigated whether we could uncover Lean's assumptions about the nature of people by inferring those assumptions from its management rubrics. As documented in our technical report on *Why Lean Management's Rubrics Cannot Tell Us What Lean's View of People Is* (Vitalo and Bujak, 2019a), one cannot confidently reason backwards from rubrics to assumptions about people's nature. Lean management's guidance is essentially a set of dictums that clarify what one should do and how one should behave. "Strive for perfection in all operations," "Go to the source to find the facts" (Genchi Genbutsu), and "Respect people" are three examples. While such rubrics can stimulate thinking about human nature, one can not deduce *unequivocal* answers. Rubrics tell a manager how to *behave*, but a person's behavior may derive from very different motives and for different reasons. Vitalo and Bujak (2019a) investigated in detail one cornerstone rubric, "respect for people." By analyzing various expressions of this dictum as offered by different Lean writers, they showed the variety of meanings it can imply about the nature of people. For example, consider the notion that we should respect people "simply because it makes good business sense" (Shook, 2011). This explanation provides a utilitarian reason for respecting others. It suggests three possible human qualities: (1) the experience of being respected energizes people to perform what the person communicating that respect asks them to, (2) people behave in ways that get them what they seek (they are utilitarian by nature), and (3) that people are willing to manipulate others to acquire what they want (they can be manipulative). Why is pursuing a utilitarian end manipulative? Because Shook's explanation suggests that one should express respect for others because it motivates the others to behave in the ways you want them to behave. Respect is a response to one expresses when they perceive qualities in others they deem to be of value. It has no motivational quality. To express it not as a response to the perception of a person's value but to motivate a desired behavior is manipulative by definition.

Shook (2011), however, also states that we should respect others because "it's the right thing to do." That is a moral, not a utilitarian justification. It suggests that (1) there are one or more fundamental moral imperatives that people should abide by for some unstated reason and (2) people are unreliable when it comes to behaving morally. The second inference is based on the fact that people Shook's statement suggests that people need rubrics to remind them to behave as nature (or whoever) requires them to.

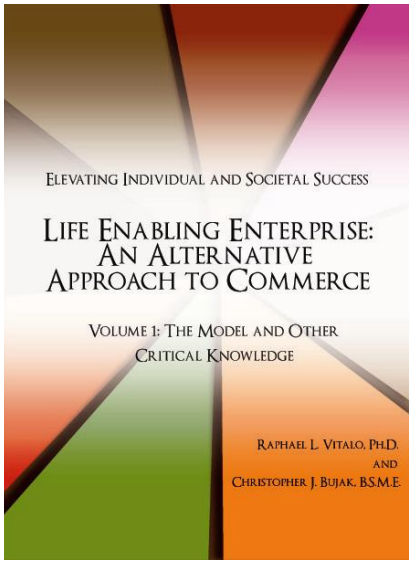
The above exercise simply shows the futility of trying to reason backwards from Lean management rubrics to Lean's fundamental assumptions about the nature

of people. Not only do you end up with multiple possible solutions, you have no bases for deciding which, if any, is valid.

Toyota Cannot Be Used to Close the Gaps[9]

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. They are numerous and serious

[9] See *Why Toyota Is Not Lean Thinking's 'Rosetta Stone'* (Vitalo and Bujak, 2021) for a thorough discussion of the limitations of using Toyota as one's guide for understanding what constitutes the Lean approach to commerce.

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 in Exhibit A1 of Vitalo and Bujak's (2021) technical report.

Convene a Type of "Loya Jirga" to Close the Gaps

A loya jirga, or grand council, is a gathering of elders whose judgments about social and legal issues are consensually arrived at and accepted by their followers as authoritative. Could a loya jirga be convened and used to close the gaps in the Lean Enterprise model? We think not. Beyond the feasibility of such an endeavor given the worldwide breath of the Lean community, the killer factor for us was who speaks for Lean? Who among the hundred thousand or more Lean community members should generate the missing pieces in the Lean model and, given their recognized stature, establish their judgments as firm and authoritative to the degree that all Lean entrepreneurs will accept them? To these questions, we see no practical answers.

What We Concluded

The conclusion of this project is that there is no feasible method available to close the gaps in the Lean Enterprise model that would result in an authoritative and accepted knowledge base for guiding a commercial enterprise in developing and conducting itself as a Lean enterprise. Thus, after spending more than three years researching and writing our book detailing what we understood to be the "Lean Enterprise Model" and describing how to implement it faithfully, and also providing a set of tools to support such action, we judged that we could not publish our work. Despite all our research, we had no legitimate basis for asserting that what we described was indeed an authoritative statement of Lean thinking. We also realized that the underlying commercial model a business adopts trumps the dictates of any management philosophy it claims to embrace. The dominant producer focused, profit driven approach to commerce (capitalism) will always see its employees as a cost. They will never share in any serious way control of management decision making with them. And, as to their conduct in any marketplace they enter, a capitalist enterprise is always going to pursue control of that marketplace including establishing its advantage over its customers. Such a state of power asymmetry ensures the greatest monetary gains. As Adam Smith wrote two-and-a-half centuries ago, it enables them to raise "their profits above what they naturally would be, to levy, for their own benefit, an absurd tax upon the rest of their fellow-citizens" (Smith, 1776, pp. 213–214).

After several more years of research and development, we developed a fully formed commercial model that, in good Lean tradition, incorporates what we learned from our previous work. We have labeled it "Life Enabling Enterprise." An advance review copy of this new book is available for free download until September 2022 at:

http://www.vitalentusa.com/links/pdfs/LifeEnablingEnterprise-Vol1-ARC.pdf

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