
Lean behaviors

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Seeks to extend the traditional understanding of productivity by more closely coupling task and behavioral elements of work within the bounds of 1890s mass production principles and 1990s lean production principles. Comparisons are made between common batch and queue manufacturing methods and the typical behaviors exhibited by people in the workplace, which are known to be deficient in their ability to establish trust and gain commitment. A new model for leadership and organizational behavior based upon the philosophy and practice of lean production is presented, and contains concrete symbols rooted in behavioral science, philosophy, economics, and industrial engineering. The practice of lean behaviors is shown to be an essential element for producing healthy work environments that can lead to economic growth, as well as help businesses sustain efforts to become lean producers. The principal focus is on how individuals can consistently behave in ways that create value, with the goal of eliminating waste in both intra- and interpersonal relationships. Also included are guidelines to facilitate the selection and development of people that possess basic capabilities for eliminating waste in their thoughts and actions.

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Introduction

For about 100 years, US manufacturers have relentlessly pursued efficiency strategies to reduce costs, improve output, establish competitive position, or increase market share. The scientific management methods developed by Frederick Taylor (Taylor, 1967) and the mass production manufacturing philosophy and practices developed by Henry Ford (Womack *et al.*, 1990) resulted in significant useful improvements for the era in which they were used. However, the early process-oriented mass production methods have, since the Second World War, largely degenerated into results-oriented, output-focused, production systems that rigidly control most manufacturing businesses today. It is likely that this production system was "improved" over time by aggressive and undisciplined results-oriented managers seeking to raise production efficiency to meet both explicit and, more importantly, implicit company or personal goals. Such behavior, practiced over decades, typically results in the solidification of corporate cultures with debilitating inward focus, and where eventually the voice of the customer and other stakeholders could no longer be heard. In addition, suppliers would develop similar behavior patterns either independently or more likely the result of their relationship with more powerful and influential customers (Jenner, 1998).

While US manufacturers were refining a results-oriented batch and queue production system that enjoyed the benefit of abundant resources, Japanese manufacturers re-building after the Second World War had less human, material, and financial resources. As a result of these and other factors, the problems they faced in manufacturing were vastly different than their Western counterparts (Womack *et al.*, 1990). These circumstances led to the development of a new, lower cost, manufacturing philosophy and practice. Early leaders were Eiji Toyoda and Taiichi Ohno of the Toyota Motor Co., and Shigeo Shingo, a consultant to Toyota and other Japanese manufacturers. They systematically developed a disciplined process-focused production system (Ohno, 1988; Shingo, 1988), now known as the "Toyota Production Sys-

tem", or "lean production", whose objective is to minimize the consumption of resources that add no value to a product. The resulting competition among US and Japanese auto makers over the last 25 years is now legendary, particularly because lean production methods can be very difficult to duplicate even by those who know it best (Taylor, 1997). The competitive advantage of lean production is formidable and has yet to be fully realized even in the automotive industry (Womack and Jones, 1996).

Lean production, applied correctly, results in the ability of an organization to learn. As in any organization, mistakes will always be made. But mistakes are not usually repeated because this is a form of waste that the lean production philosophy and its methods seek to eliminate (Robinson, 1990). In contrast, most businesses, whether service or manufacturing, typically repeat the same mistakes again and again, year after year. This is evident in the average performance of most large companies, which is today best characterized by the degenerate workplace depicted in Dilbert® cartoons. The ability of an organization to learn does not require it to have a lean production philosophy. However, it must possess an ability to change how it thinks (Senge, 1995), which requires a culture characterized by trust, shared responsibility, and openness to experimentation without fear of failure (Senge, 1996). Instead, the majority of companies have functional, results-oriented leadership highly skilled at maintaining the status quo or perpetuating local optimization strategies (Jenner, 1998).

Managers practicing in such environments quickly recognize that they must alter their behavior to that of the group in order to "survive" in the workplace. This is the path of least resistance, a well-worn low road accessible to anyone capable of trading integrity for personal underperformance. The toll that this exacts on a manager is to become a living stereotype; a clone of Dilbert's® hapless boss that employees inevitably ridicule as a means to find solace. The widespread popularity of this cartoon and its related merchandise concretely demonstrates that "Dilbert® Companies" are extremely common in today's business world, and that low-trust

managers highly skilled in the de-accession of knowledge are even more common. In contrast, there are few managers that perform as truly successful role models. To do so would require the discipline to learn, practice correct behaviors (Emiliani, 1998), understand the system-level implications of their actions (Senge, 1990), and unlearn political behaviors.

Businesses that are unable to learn and change their behavior will, no doubt, risk the future existence of their entire enterprise as currently governed. This will cause prolonged distress and lead to high turnover amongst the various stakeholders – suppliers, investors, and employees (Campbell and Alexander, 1997) – and create easy opportunities for competitors. Handing the competition advantage will further de-stabilize a company and lead to even greater future turmoil.

Figure 1 [1] shows the key participants in a business, each having a relationship governed by processes that are defined by a complex mix of industry norms, formal business procedures, State and Federal laws, finance and accounting rules, information systems, informal practices, and unspoken assumptions. The leaders of well-managed businesses know that they have a serious responsibility to understand the role of each constituent within this community, what they want, the information they provide, and the processes and behaviors governing generative relationships. Each of these relationships should be carefully managed in order to minimize waste and maximize the benefits to all that function within the community. The interaction with these constituencies should be balanced, since favoring one over another typically leads to under-performance in key areas such

as product quality, on-time delivery, financial performance, or customer satisfaction.

Working efficiently

Frederick Taylor devoted his life to improving the productivity of manufacturing organizations and the prosperity of the production community (Taylor, 1967). He was generally concerned about the waste of material resources, its impact on both US industry and its global competitiveness, its effect on people and their wages, as well as prices paid by consumers. Taylor's particular interest was in the waste generated by workers in their daily activities that he claimed were vast, less visible, very much under-appreciated, and costly. His goal was to develop workers' ability to achieve maximum efficiency by understanding materials, tools, and the sequence in which the work was performed. This included analyzing physical movements, performing time studies, and dividing certain activities between management and production workers. Undaunted by critics, nay-sayers, and negative attitudes, Taylor's often lengthy and elaborate experiments enabled him to prove, over time, that counter-intuitive methods often were, in fact, the most effective solutions for achieving significant increases in efficiency. Simply stated, Taylor's "four great underlying principles of management" are the:

- 1 development of a true science;
- 2 scientific selection of workers;
- 3 scientific education and development of workers; and
- 4 co-operation between management and workers.

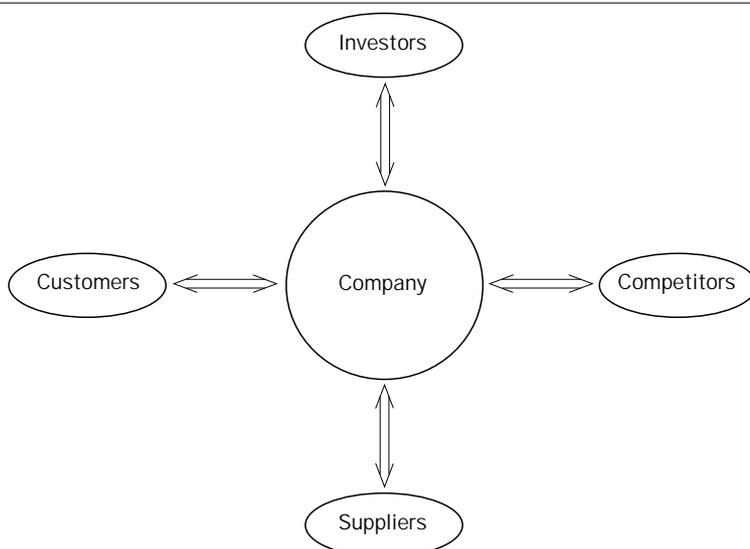
Taylor understood the concept of waste in its most subtle forms, and the applicability of his model to the management of individual and group activities in settings other than manufacturing for which he is best known. He discussed the destructiveness and suffering caused by adversarial relationships between employers and employees and wrote of the importance of co-operation, friendship, harmony, and mutual prosperity in the workplace. Elsewhere in his paper, Taylor re-stated the principles of management in complimentary and more humanistic terms:

- science, not rule of thumb;
- harmony, not discord;
- co-operation, not individualism;
- maximum output, in place of restricted output; and
- the development of each worker.

It is apparent that Taylor clearly recognized the importance of human behaviors,

Figure 1

The key participants in a business



including trust, to the technical success of his scientific management principles – i.e. measurable improvement in manufacturing productivity as determined by early cost accounting and industrial engineering metrics. However, US industry typically misunderstood, mis-applied, or selectively applied, Taylor's principles, which led to highly visible inferior outcomes for which he alone is often blamed. In fact, the totality of Taylor's philosophy and methods represented breakthrough thinking and were the foundation upon which lean production principles were constructed beginning in the 1930s (Shingo, 1988).

Employees performing task work in the late 1800s and early 1900s often had perceived or social incentives to work slowly and thus limit daily output of parts. In addition, time-honored trade methods handed down by word of mouth from artisan to apprentice were thought to be the most effective means of accomplishing work. The logic of such behavior was that this would help perpetuate employment of vast quantities of workers at the local level. There was little understanding of the higher order impact of such behavior because alternative scenarios were not generally sought after or, if available, proved to be unconvincing. However, Taylor showed that oral tradition and the protection of one's interest, which appears entirely logical, would generally result in reduced demand for products and a poor understanding of how much work could actually be accomplished. Alternatively, if employers and employees cooperate to improve productivity, then it is likely that output could be greatly increased which would result in lower prices, higher sales, higher wages, higher profit, and improved competitiveness. However, the apparently productive work methods owned by trade person role models proved to be a powerful inhibitor to change that took decades to overcome even on a small scale.

Early practitioners of lean manufacturing believed that it was management's responsibility to structure the workplace to maximize productive output. This required the elements of work to be closely analyzed and the testing of alternative methods through careful experimentation. Work would be reduced to smaller elements, often only seconds in duration, to understand better how time was utilized. Such a strategy would systematically reduce the influence of the tradespeople and their oral tradition, and erode their start-to-finish manufacturing skills that required years of apprenticeship to fully develop. However, the loss of individual power and influence gives way to a new strategy that is capable of better serving the larger

community: investors, suppliers, employees, and even competitors. The mindset and behaviors that evolved in support of lean production have proved to be a formidable means of producing goods in ways that constructively reinforce each other.

Behaving poorly in the workplace makes everyone, including management, ignorant of how well people can actually behave, and results in the evolution of new types of undesirable behavior patterns. Poor behaviors allow people to avoid co-operation, gain personal advantage, and protect personal or departmental interests. These self-serving habits become well-developed over time, resulting in highly skilled but unproductive gamesmanship that no customer would want to pay for. All too often the most highly skilled gameplayers become unwholesome ego-driven role models for future generations. Survival of the fittest, in this context, means the lowest forms of behavior win – but only on a personal level, which is good enough for many people. However, the corporate culture, which mirrors the aggregate of individual behavior of managers, will likely fail to serve the larger community. The result is a deterioration of trust between workers, management, suppliers (Sheridan, 1997), and investors, which can further erode a company's competitive position. Competitors may also suffer from this, as they now often work together in joint ventures or other cooperative business arrangements. A lack of trust and differences in corporate culture have been cited as primary reasons why collaborative business arrangements often fail or at least fall well below expectations (Kanter, 1994).

Unlike manufactured goods, it is much harder to systematically analyze a person's behavior and test alternative methods through experimentation within the daily turmoil of work environments. That is unless one has the benefit of a full-time coach or is disciplined enough to independently develop better behaviors. The last 15 years have seen a great surge in resources to address interpersonal skill and leadership development, and includes journal articles (Manzoni and Barsoux, 1998; Simons and DaVila, 1998), books (Bennis and Nanus, 1985; Cleary, 1989; Covey, 1989; Goleman, 1995), seminars, and consulting practices. No doubt these are great resources. However, the reader or participant often finds that the methods or information are too "soft and fuzzy" and do not deliver strong footholds that can be easily remembered and applied. Thus, behavioral performance often loses significance in the face of strong competition and demanding business performance metrics. However, it is clear that

companies must raise their expectations for productive behavioral performance since this is inextricably linked to the productive output of goods and services. Very few companies do both well enough to gain sustained competitive advantage and widespread stakeholder satisfaction.

Lean manufacturing and lean behaviors

Waste in lean production is defined as actions that do not add value to a product and can be eliminated. Waste is viewed by those that understand the concept deeply as the singular enemy that greatly limits business performance and threatens prosperity unless it is relentlessly and systematically eliminated over time. The primary types of waste include defects, re-work, overproduction of goods, transportation, waiting, inventory, unnecessary movement, and unnecessary processing (Womack and Jones, 1996). The search for waste is never-ending and regarded as one of the few things that non-production workers can do to add value to products. For example, machine downtime is the bane of manufacturing, and its elimination can be a preoccupation for vast numbers of workers. However, people downtime, as characterized by poor relationships or lack of communication, is routinely tolerated by management and may even be implicitly encouraged in highly political workplaces.

The concept of waste has not yet been effectively extended to the self-defeating behaviors of individuals and groups of people in the workplace. Why has not the same revulsion for waste developed in the context of poor interpersonal relationships present in most business settings? We work very hard to improve manufacturing productivity, yet place comparatively little emphasis on improving our own behaviors. Shop productivity takes precedence over behavioral productivity because money, defects, inventory, and time are much easier to measure. In addition, the level of stress in competitive business settings can make it very difficult to eliminate behavioral waste. Humans have repeated the same mistakes for thousands of years (Senge, 1995), which shows that we rarely understand their root causes. The persistently wasteful individual and group behaviors could be a reason why many large businesses fall well below the expectations of one or more of its stakeholders.

We all know people that behave oddly at work. Some get annoyed by the smallest irritants, others are overly aggressive, rude, or demeaning, and a few are just impossible for

most people to get along with. We generally tolerate the disruptive personalities found in the workplace, preferring instead, when pressured, to cite a key strength that they possess along a singular dimension such as technical capability or historical or functional knowledge. Amazingly, very few people truly grasp the enormous negative impact that such behaviors have on an organization. How often have you heard or even said:

I am not doing this for Bill because he never helps me when I need something.

Susan is really difficult to work with ... stay away from her!

I don't think Dan deserved that promotion.

Jill thinks the Vice President is an idiot.

All of these comments can be viewed as "normal" business behavior, but they are, in fact, waste because they add no value and can be completely eliminated from the conversation. Such comments disseminate incomplete information, reinforce stereotypes, build or perpetuate barriers, hide important issues, and completely block progress between individuals (Senge, 1995). Can this be a reason why so many large businesses report rather mediocre financial results year after year (*Fortune* Editors, 1998)? Should net profits consistently less than 5 percent not signal that something is wrong, rather than being acceptable to most shareholders?

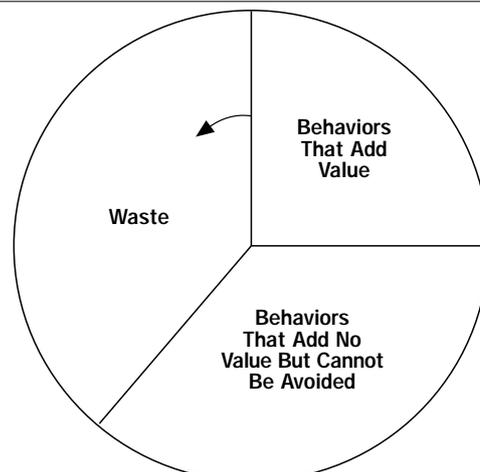
We also know colleagues that possess good "people skills". They are highly valued in business and generally have a process-focused style whose benefits are only realized over time. However, they can be easily eclipsed by results-oriented colleagues that force progress on narrow issues with little regard for the higher-order impact. These people often become the role models that others follow in order to achieve their desired status or income level. This duality is tacitly accepted in most corporate cultures because the stakes are high and process-oriented methods are ignored or judged to be too dull or risky. However, support for this duality creates a destructive tension that leads to widespread confusion and consistent underperformance. The lack of disciplined behavior between individuals or between the company and its stakeholders can be important factors that limit the life span of most businesses to about 30 years (de Geus, 1997). The long-term impact of dysfunctional behaviors – office politics, irrationality, lies, confusion, and deceptions – can never be good, as they surely divert attention from the stakeholder community.

It takes a great depth of knowledge and real teamwork to effectively eliminate waste in manufacturing processes. It takes as much, if not more, knowledge and real teamwork to

eliminate waste in interpersonal relationships (Eisenhardt *et al.*, 1997; Katzenbach, 1997). Managers routinely ask for, and get, greater improvement from the factory floor each time new cost, delivery, or quality goals are established. However, employees rarely demand that managers behave in ways that challenge their interpersonal skills and strive for consistent effectiveness. Followers too often accept arbitrary or unusual situation-specific behaviors from their leaders, most likely due in part to a well-founded fear of retribution. The most successful businesses challenge themselves to achieve functionality in a wide range of operating practices, not just in manufacturing performance. The ability to learn and transmit learning among individuals and key constituents in a rapidly changing business environment will help ensure future prosperity (Senge, 1990).

The concept of "lean" behaviors is analogous to lean production. Lean behaviors are defined simply as behaviors that add or create value (Figure 2)[2]. It is the minimization of waste associated with arbitrary or contradictory thoughts and actions that leads to defensive behavior, ineffective relationships, poor co-operation, and negative attitudes. A person exhibiting lean behaviors is most easily recognizable by their ability to resist the temptation to contribute wasteful verbal or gestural content to conversations. In contrast, behaviors that inhibit work flow are analogous to wasteful batch and queue mass production methods. These behaviors are termed "fat" behaviors, and are defined as behaviors that add no value and can be eliminated. They include the display of irrational and confusing information that results in delays or work stoppages, or the articulation of unsubstantiable subjective thoughts and

Figure 2
Lean behaviors, fat behaviors and waste



opinions. Fat behaviors are recognizable as lots of talk where nothing has actually been said, or indirect words whose meanings are subject to variable interpretations. Savants at deciphering fat behaviors learn how to "read between the lines" – an unproductive skill that can further proliferate fat behaviors.

Five fundamental concepts

The beauty of the lean production philosophy is that it couples disciplined personal behaviors to disciplined production methods. The production methods are simple to grasp, yet can be very difficult to apply and are deceptive in the depth of their total value to an enterprise. It appears complex especially to people whose mindset is rigidly fixed in batch and queue manufacturing practice. This chasm is more easily transcended after one has participated in kaizen events facilitated by experts in lean production methods (see, for example, http://www.ijnet.or.jp/shingijutsu/indx_e.htm, <http://www.gembakaizen.com>, and <http://www.lean.org>). There are five basic concepts that define lean thinking and enable lean production: specify value, identify the value stream, flow, pull, and perfection (Womack and Jones, 1996).

Specify value

In lean production, the value of a product is defined solely by the end-use customer. The product must meet the customer's needs at both a specific time and price. The thousands of mundane and sophisticated things that producers do to deliver a product are generally of little interest to customers. This differs markedly from what most companies do, which is to specify value from the point of view of engineering, finance, marketing, or other internal departments. Value specified by functional experts is a self-serving means of preserving local interests within a company, as it reinforces the power and influence of certain organizations, their people, their ideas, and their equipment or technologies. It is an effective means of raising today's level of status quo to meet tomorrow's more demanding status quo requirements. It is also long-term waste. To view value through the eyes of the customer requires most companies to undergo difficult and comprehensive reorganization of people, their mindset and behaviors, and business processes.

Specifying value in interpersonal relationships means simply to understand the wants and expectations of the people that we interact with. It means to understand what other people want or expect you to be, what they

want or expect to hear, what they want or expect to see, or what they want or expect you to say or do. It is the behaviors that others judge to be acceptable in certain environments. To what extent should you try to meet these expectations? Well, that depends upon the circumstances. In some cases it would be very wise, while in others it would be completely foolish. Specifying value in human interactions is much more complicated than in human-product interactions. In all cases we should at least understand the wants and expectations of others since this then gives us opportunities to add value in our interactions. Seeing the value of our words and actions through the eyes of our colleagues can enable the reduction of wasteful interpersonal behaviors.

Identify the value stream

Identifying the value in lean production means to understand all the activities required to produce a specific product, and then to optimize the whole process from the view of the end-use customer. The viewpoint of the customer is critically important because it helps identify activities that clearly add value, activities that add no value but cannot be avoided, and activities that add no value and can be avoided. For example, most companies that manufacture personal computers have long believed that wholesale and retail distributors were an integral component of the value chain whose cost was part of the price that customers are willing to pay. That was until one company, Dell Computer Company, understood that inventory-intensive distribution adds no value and can be avoided by using innovative direct marketing methods, thus reducing product cost and increasing value in the eyes of end-use customers (Fisher, 1998). Price-sensitive customers have rewarded Dell with significant year-over-year increases in sales, profits, and market share. Dell's direct marketing strategy also rewards investors with higher returns and suppliers with increased sales. The rewards enjoyed by competitors include a better understanding of their customer's purchasing preferences and how to improve return on assets through more effective utilization of working capital. In other words, competitors gain useful knowledge - if they can learn.

Identifying the value stream in individual or group behaviors means to understand what people do and why they do it. Behaviors are usually closely linked to the functions that people perform, and include the work and non-work pressures that people face in the performance of their activities. Careful observation will reveal that some behaviors

clearly add value, some behaviors add no value but are unavoidable, and some behaviors add no value and can be eliminated. The behaviors and perceptions embedded within the functions that people perform are a primary factor in determining if they add value, or are allowed to add value, to a product or service. For example, have you ever discounted your colleagues in procurement, marketing, manufacturing, or information systems because you do not understand what they say or do? Did you behave in a manner that helped uncover the underlying meaning or concern?

The value stream in relationships is rife with waste when people do not talk to each other and instead remain focused on the inner workings of their own functional worlds. People can change their mindset and learn to see the whole instead of only their part. The resultant clarity creates the foundation from which we can begin to understand what other people do and then identify where waste can be eliminated. For example, if we discovered that a report required by manufacturing every month is aggravating and time consuming for marketing to prepare, and that this contributed to tension between the two functions, then a better solution could be found that might also improve the behaviors of the two groups. Progress like this will not occur unless there is trust, a willingness to share information, and acknowledgment that local actions or behaviors can have significant emotional impact on others.

Flow

After value has been specified and value streams have been identified, the next step is to get the activities that add value to flow without interruption. Flow in lean production means to process parts continuously, from raw materials to finished goods, one operation or one piece at a time. This is in contrast to batch and queue manufacturing methods, where large batches of parts are processed sequentially; that is, the entire batch does not move to the next operation until all parts have been processed by the prior operation. This discontinuous production method results in lengthy queue times and large quantities of expensive inventory, both of which add to the cost of the product. Batch and queue remains the dominant method of production because the many benefits of flow are counter-intuitive. Flow production methods can be very difficult to implement in mature manufacturing businesses because they challenge all aspects of conventional manufacturing wisdom and practice. It is important to recognize that batch and queue manufacturing is performed solely for

the benefit of the producer, whereas flow production responds to the value in products as specified by end-use customers.

Flow in a behavioral context means to behave in a manner that minimizes or eliminates delays or stoppages in the work performed by others. Common practices that cause delays include contradictory or confusing words or actions delivered by managers or colleagues. Any form of inconsistent behavior will create queues that threaten responsiveness to rapidly changing conditions. A manager's inability to "walk the talk" is perhaps the most obvious form of waste that can cause massive confusion and delays as employees spend time trying to figure out what is really being said. Simply put, the fat behaviors normally exhibited by managers or employees cause widespread frustration and reduce commitment, participation, and co-operation. As in batch and queue manufacturing, fat behaviors are intuitive and eliminate flow amongst workers, while lean behaviors are counterintuitive and facilitate clearer meaning and direction.

Pull

The concept of pull in lean production means to respond to the pull, or demand, of the customer. Lean manufacturers design their operations to respond to the ever-changing requirements of end-use customers, while the operations of batch and queue manufacturers are designed to meet their own local needs. Those able to produce to the pull of end-use customers do not need to manufacture goods according to wasteful and inaccurate forecasts that batch and queue manufacturers must rely upon. The planning for delivery of product to end-use customers is less troublesome, and demand becomes more stable if customers have confidence in knowing that they can get what they want when they want it.

Pull applied in a behavioral context means to recognize that people operate under many different mental models (Senge, 1990), which requires us to adjust our style or approach often. We can think of the people that we interact with as customers, where each one has a different set of demands. If we are able to adjust our approach to that demand, then we can fluidly meet the requirements and expectations of others. If, however, we respond according to a fixed mental model – i.e. batch and queue behavior mindset – then we can rarely meet expectations. Instead, we have to forecast the response of others based upon our own behaviors that have been designed over the years to meet specific personal needs. Forecasting the behaviors of others is pure waste because it is time consuming and often inaccurate, and should thus

be eliminated. Practicing lean behaviors reduces ambiguity and re-work in interpersonal relationships.

Perfection

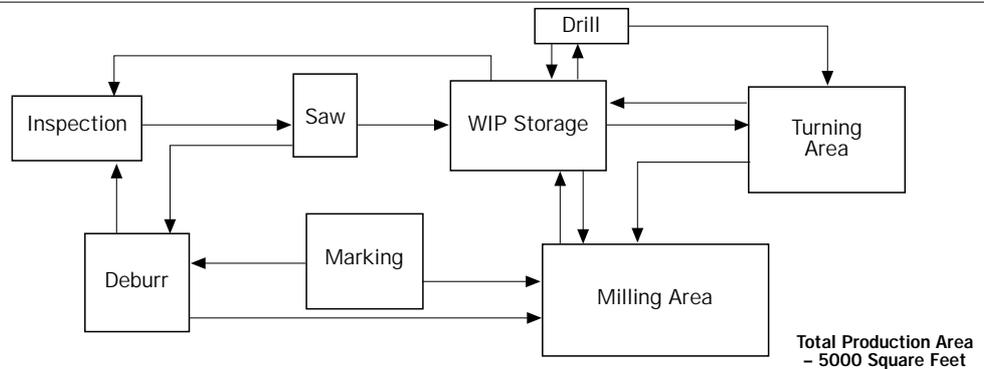
If an enterprise can do the first four steps well, then all activities become transparent. This enables people to more easily identify and eliminate waste, and focus on improving activities that create value. The first four steps interact in a "virtuous circle" that enables the pursuit of perfection. The concept of perfection in lean production means that there are endless opportunities for improving the utilization of all types of assets. The systematic elimination of waste will reduce the costs of operating the extended enterprise and fulfills the end-use customer's desire for maximum value at the lowest price. While perfection will never be achieved, its pursuit is a goal worth striving for because it helps maintain constant vigilance against wasteful practices.

Similarly, perfection in a behavioral context means to take advantage of the transparency brought about by the first four steps in order to more easily identify and eliminate behaviors that do not create value. A transparent environment delivers more immediate feedback to people, which is of great benefit to everyone because it enables the pursuit of behavioral perfection. Behavioral perfection is as impossible to achieve as perfection in lean production. However, people that can move from fat to lean behaviors will, over time, be as successful as those producers that have moved from batch and queue to lean production.

Intuitive versus counterintuitive thinking

Batch and queue production methods are a natural way of thinking for most people; it is an entirely intuitive way to make things (Figure 3)[3]. Practitioners of this method prefer large batches processed sequentially, which requires the use of economical lot sizes to effectively amortize lengthy machine set-ups. It is not unusual to find set-ups, or change-overs, taking several hours or even days to perform. This production mindset completely discounts the possibility that change-over can be achieved in minutes and that small quantities can be produced quickly and more affordably under flow manufacturing conditions (Figure 4[4]) (Robinson, 1990). The logic against economical lot sizes and hours-long set-ups can be nearly impossible for many people to realize, particularly if they grew up in a batch and queue environ-

Figure 3
Batch and queue manufacturing



ment. That is unless they are taught to see the massive amount of waste through direct experience such as *kaizen* events.

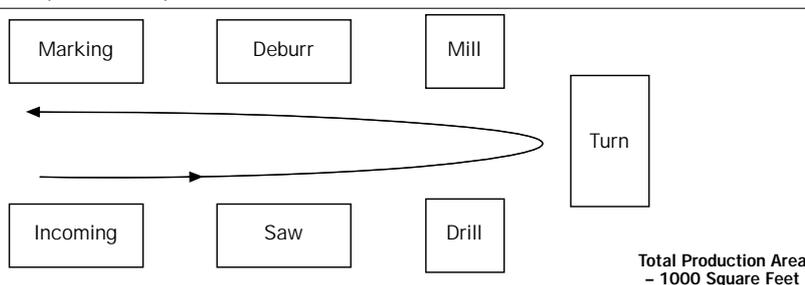
Similarly, fat behaviors are also intuitive, and its practitioners are much too common. They specialize in the expulsion of amorphous conglomerates of thoughts and actions that maximize the consumption of psychological resources. Their behavior impedes flow between people because its primary operating mechanisms include deception, gossip, innuendo, half-truths, lying, revenge, and destructive political behaviors driven by high ego. The result is local or widespread confusion, negative emotions, stress, frustration, defensiveness, and deterioration of the social structure. It is nearly impossible for most people to see the destructiveness of fat behaviors because their mindset constitutes the form and substance of this mental model. People have difficulty seeing themselves behaving differently in a workplace that promotes self-preservation, and is characterized by such terms as “survival of the fittest” or “dog-eat-dog”. It is hard for many to imagine that they can be more effective when past behavior patterns have delivered financial security and status. The personal risk is to just too great and the rewards are uncertain.

In contrast, lean behaviors are counterintuitive just as lean production is

counterintuitive. It involves saying or doing what needs to be said or done at the right time, in the right proportion, for the right purpose, to the right people. Interpersonal flow is enabled by self-awareness, humility, suspension, deference, calmness, and quietude (Cleary, 1989). This improves trust and generates other value-creating opportunities, and helps eliminate waste due to delays, inspection or verification, and re-work. For example, how often have you worked weeks to give an important presentation to managers (i.e. an inspection), then get sent back to go get more data (i.e. re-work), and present again (i.e. verification) a few weeks later (i.e. a delay)? The practice of lean behaviors might have clarified the intent and desired outcome of the presentation first given.

Fat management styles have their philosophy rooted in the belief that the principles that guide human interaction are based upon the lowest forms of behavior: i.e. selfishness, distrust, envy, hate, greed, revenge, etc. Today’s managers, like turn-of-the-century tradespeople, may soon be forced to abandon rule-of-thumb management practices based upon fat behaviors in favor of new lean behavior methods. However, they will not do this unless it can be proved, through training and experimentation, that counterintuitive methods are often more effective.

Figure 4
One-piece flow production



Behavioral waste

The fat behavior patterns that managers develop over time become a skill that often causes unintended consequences (Argyris, 1986, 1991, 1994; Kurtzman, 1998). For example, the ability to communicate ambiguously and without ever making a commitment results in the avoidance of conflict. Refinement of this skill reduces people’s ability to say what they mean, sometimes even in the

simplest of conversations, and forces other people to “read between the lines”. If such behavior becomes the norm, then the unintended consequence is an organization that cannot effectively discuss important issues. Business problems linger unresolved, often for years, and it becomes increasingly difficult to confront the issues. Ignoring problems leads to repetitive errors that consume resources whose focus is usually on short-term solutions to appease management.

The fear of real or perceived threats lead to the establishment of unwritten rules and assumptions that dominate the behavior of all employees. Both the people and the business then lose their ability to learn from internal or external sources, except, of course, those that teach defensive behaviors. Activities become less process focused and increasingly transactional, which further satisfies the culture’s strong desire to limit communication and avoid conflict. Trust becomes a non-issue because there simply is not any. This leads to increasingly destructive behavior patterns that promote functional allegiance and minimum cross-functional co-operation (Schein, 1996). Conversations are reduced to simple comments, obligatory discussions, or debilitating debates, and emotions are either flat due to disinterest or enraged in the defense of one’s views. Information becomes closely guarded, the transfer of knowledge is biased towards agreement or good news, and learning is stunted so that an organization is not able to accurately assess its competitive position.

An organization that does not possess the basic ability to communicate loses important opportunities to engage in more substantive forms of communication such as dialogue (Isaacs, 1993; Schein, 1993). Dialogue is a powerful way to share knowledge, gain appreciation of others, learn, solve problems, and create value. The suspension of ego, emotion, assumptions, and paradigms in dialogue allows the issues to come to the surface for holistic exploration. It also permits colleagues to mutually explore their fields of knowledge and reflect upon what they have learned (Shaw and Perkins, 1991). A fast-paced transactional environment can discourage people from slowing down long enough to listen, inquire, and test their beliefs. The satisfaction that some people gain from solving a constant stream of unexpected problems can be so great that they find it difficult to reflect, strategize, or engage in substantive dialogue to uncover the root cause of systemic problems. The “heroes” and “firefighters” become the dominant model of an effective employee. Reward systems are often well aligned with crisis management

which further adds to the challenge of breaking free of fat behaviors.

Relations with stakeholders will no doubt suffer due to these defensive behaviors. Suppliers are usually the first to feel the negative consequences, followed by customers, then investors. A savvy competitor can gain valuable information by asking these stakeholders for benchmark comparisons of their own behavior under different conditions. The company that exhibits the most consistent generative behaviors, as well as helpful tendencies, will be the partner of choice for employees, suppliers, customers, and investors. Lean behaviors exhibited by the corporate culture should be a strong source of competitive advantage.

This is but one example in which the impact of behavioral waste should be easily recognizable across a wide range of stakeholder conditions. Most employees would likely say that they know this happens all the time, but they allow the waste to perpetuate either because it seems impossible to overcome or because its elimination is not valued or rewarded by management. At least the waste is recognized, which is a first step. The next step is to find ways to eliminate it to the greatest extent possible. Table I compares common fat behaviors that result in waste

Table I
 Comparison of behavior attributes

Fat behaviors	Lean behaviors
Confusion	Self-awareness
Unnecessary commentary	Humility
Irrelevant observations	Compassion
Random thoughts	Suspension
Self-imposed barriers	Deference
Ego	Calmness
Irrationality	Quietude
Revenge	Reflection
Inaction	Honesty
Positions	Benevolence
Interpretations	Consistency
Uncertainty	Generosity
Negativity	Patience
Excess	Humor
Gossip	Understanding
Sarcasm	Respect
Preoccupation	Listening
Ambiguity	Observation
Extreme flattery	Trust
Cynicism	Sincerity
Subjectivity	Equanimity
Bias/prejudice	Objectivity
Deception	Discipline
Selfishness	Rectitude
Pride	Wisdom
Criticism	Balance

and selected lean behaviors that promote flow between people (Cleary, 1989, 1996). It is important to realize that interpersonal skills and organizational effectiveness are developed by practicing and improving upon weaknesses (i.e. lean behaviors), not strengths (i.e. fat behaviors).

The following is a list of the results of fat behaviors commonly found in the workplace. They include real or implied threats to help make things happen, management secrets, minimal feedback, poor results in employee surveys, few suggestions in the suggestion box, etc.:

- threats, real or implied;
- micromanagement;
- disappointing employee surveys;
- few improvement suggestions;
- employees stuck in functional area;
- scarcity mentality/limited resources;
- low turnout at meetings;
- calls not returned;
- annoyed stakeholders;
- slow response to changing conditions;
- employee turnover;
- rumors;
- transactional focus;
- crisis management;
- failure not tolerated;
- unclear expectations;
- little or no feedback;
- appearance over substance;
- favoritism;
- many procedures;
- low trust;
- talk not walked;
- management secrets;
- few rewards;
- ego-driven decisions;
- department or functional focus;
- unmet stakeholder needs;
- relentless pace;
- poor listening skills;
- broken promises;
- élitism;
- delays in action;
- confusion;
- destructive politics;
- declining market share;
- fear;
- ignorance;
- blind obedience;
- reduced loyalty;
- mistakes repeated; and
- conflict

Many of the consequences of fat behaviors relate to the loss of employee commitment. It is obvious that if employees do not feel they are being heard, then their participation in the business is likely to be greatly reduced. It thus follows that the prosperity of employees,

and those groups within the stakeholder community that interact with employees, should also be reduced.

The economics of lean behaviors

Taylor's thinking can be extended to show that two main elements are required to achieve productive work. Assume that work, whether performed in the shop or office, consists of two discrete components of equal value: non-emotional and emotional. The non-emotional, or rational, content of work is related directly to the physical manufacture of a product – documents, tools, machines, materials, and motions. High non-emotional productivity implies people performing tasks efficiently in the production of goods or services. Conversely, the emotional content of work is invariably related to, if not required for, the manufacture of goods or delivery of services. It includes all things that can affect production such as written or spoken words, tone of voice, physical gestures, assumptions, and perceptions. High emotional productivity implies that people behave efficiently in support of production.

A manufacturing environment that constructively amplifies both types of productivity should be a market leader with above average return on sales, return on net assets, earnings per share, etc. It should also be a very good place to work, a sought-after company to supply, and a formidable competitor.

Employees subjected to the fat behaviors of colleagues and managers day after day cannot usually avoid at least some loss of self-esteem over time (Blitzer *et al.*, 1993). An environment rich in the practice of fat behaviors will wear people down and make them feel as if they can never do a good enough job no matter how smart they work or how many hours they put in. Recurring layoffs, few rewards or celebrations, impersonal task work, and incessant “fire drills” can make people think they are failures. Over time, they feel more alone, lose confidence in themselves and their decisions, and become less committed to achieving the goals of the organization. They may become stuck in their department because their attitude has deteriorated, which in turn reduces their performance and lowers their potential for future raises or bonuses. The economic impact of fat behaviors is felt not only by the employee, but by the company as well since its workers may not have the commitment or energy to meet the demands of competition in the market place (Koretz, 1998; Pennar and Mueller, 1997). In addition, a work environment filled with fat behaviors is unhealthy, which no doubt

leads to more sick days and higher health care costs due to stress-related illnesses.

Economists have recently begun studying and measuring the economics of social bonds, or social capital, in belated recognition of its importance within the framework of classical economic theory. Social capital is "the web of social relationships that influences individual behavior and thereby affects economic growth" (Pennar and Mueller, 1997). It examines the effects between the environment in which people live and their future health, social, educational, or financial status. As might be expected, people living in middle class neighborhoods will generally fare better in life than those living in low income areas. What is less obvious is the positive effects that generative behaviors such as trust and co-operation have on economic growth and prosperity (Fukuyama, 1995). High levels of trust result in increased participation in social groups that can be correlated to local economic growth. Social bonds are much more difficult to create when fat behaviors are practiced.

Do lean behaviors correlate with financial performance? The answer is probably yes, when one considers the totality of costs associated with fat behaviors across the entire stakeholder community – employees, suppliers, investors, and competitors. *Fortune's* annual "100 best companies to work for in America" evaluates the financial performance of one pair of relationships – that of the company and investor (Grant, 1998). The five and ten year average annual returns to investors are both approximately 58 percent greater for the "100 best companies" compared to the *Russell 3000 Index* over the same period. It should be noted that only 54 of the "100 best companies" have been publicly traded over the past ten years, which indicates that a large portion of top company-investor performance comes from relatively new businesses. It is likely that new businesses experiencing rapid growth in competitive markets are fun places to work and do not yet exhibit the extent of fat behaviors that mature businesses typically do.

Finding the right people

By the time college seniors begin to look for a job they have been exposed to about 25 professors teaching in the classroom. A question the author regularly asks undergraduates when they interview for a job is: "Of all the professors you have had in class, who were the best and why". Invariably, the undergraduates can recall only one or two professors. When asked why, they cite story-telling

ability, energy, enthusiasm, demanding but fair treatment, and ability to correlate theory and practice. In essence, they learned more from those professors that have a wider range of better-developed skills. So what about all the other professors; how is it that there can be so many who make so little impact on their customers? In most universities, the faculty has two primary functions: teaching and research. Some excel at one or the other, but few excel at both – which is what the university and its customers need. What criteria do universities use to find the right people? Certainly a successful record in research and obtaining funding will satisfy the employer to a great extent, but what qualities are sought after to meet the pull of the customer? Do professors receive training on how to teach, or are they allowed to simply repeat the same boring institutionalized methods that they learned when they were students? In general, universities have not yet met the challenge of training professors to teach to the extent that industry tries to train people to be effective managers or leaders.

If you ask the same question to colleagues at work – "Of all the managers you have worked with, who were the best and why?" – invariably they can recall only one or two managers of the many they have known over a ten, or even 20, year period. When asked why, they cite many of the same reasons that students do about their professors. But it goes a step further in the workplace, because employees that have been exposed to good managers will often remember them warmly and may even revere them. It is possible that it is because the manager behaved well, consistently over an extended period of time, towards their employees that they receive such high levels of respect and admiration – despite the preponderance of fat behaviors surrounding them. So how does one go about finding such people, who, in addition, must be capable of achieving sometimes tough business objectives?

Let us first probe this question in the context of the feeling that one gets when "time flies"; i.e. when one's attention is completely focused by the activity that is being performed. This phenomenon, the psychology of optimal experience, has been studied extensively and is called "flow" (Csikszentmihalyi, 1990). Psychological flow is the control of one's inner experience, or the moment-by-moment contents of consciousness, to a condition of happiness. Some people get this feeling occasionally, while others experience it regularly. Flow is typically achieved when the mind or body is engaged in an activity that leads to an outcome where success is within the capability of the participant. Flow

can be facilitated by engaging in activities that deliver a great sense of satisfaction such as gardening, sports, reading, playing music, painting, cooking, writing, and even work.

It can be hard to experience flow at work when one feels overwhelmed by the magnitude of the challenge, or if the challenge does not make sense to those who are responsible for carrying it out. It is even worse if the environment is frustrating and contradictory because there is rarely the sense of control that helps lead to satisfaction. If one's mental model is that work is difficult and its sole purpose is to earn a paycheck, then the odds that the person can regularly achieve flow while at work are very small – it is just something to do until the weekend arrives. Certainly an employee, with disciplined mental effort, can re-orient his or her own mindset over time to achieve greater satisfaction from work. But it would help if management could also change their mental models to help make the workplace less confusing or chaotic. Adepts of lean production have done just that; work is designed to be unambiguous and direct, and therefore production flows.

Psychological flow is achieved when the following conditions are met:

- challenging activities matched to personal skills;
- focused attention;
- clear goals;
- immediate feedback;
- freedom from external concerns;
- sense of control;
- loss of self-consciousness; and
- sense of time is altered.

People that experience flow regularly perform activities for their own intrinsic reward because it results in pleasure worth repeating. Such people have what is called an autotelic personality (Csikszentmihalyi, 1993, 1996). Control over subjective experiences often leads to peak performance, which can manifest itself in various ways. For example, the psychic demands of flow often lead to personal talents or creative results that are achieved for their own intrinsic value in the absence of known rewards. Workers that are able to convert monotonous activities to flow experiences will find their labors more rewarding and exhibit higher self-esteem or less stress (Csikszentmihalyi, 1993).

An autotelic personality could be a foundational characteristic for managers to achieve effective lean behaviors in the workplace because they are able to organize their consciousness, enjoy learning and discovery through personal experience, have the skills to recognize generative opportunities, and strive to repeat rewarding experiences.

People that can experience flow more easily should be able to transform the clutter generated by contradictory and chaotic work environments to more positive outcomes through their ability to set clear goals, focus, and ability to lose the sense of self. The loss of self-consciousness could also serve as a shield that helps protect them from the fat behaviors directed towards them, behaviors that would normally send others wandering off on to tangents designed to defend their turf, knowledge, or self-esteem. So in other words, for people with autotelic personalities, the quality of experience is determined by how they respond internally, rather than by external conditions that might otherwise consume scarce mental energy. Rewarding experiences are revisited often, which may then result in discoveries that establish new paths worth exploring. Psychological flow also delivers a sense of control through the elimination of worries that would otherwise cause distraction and inhibit flow. Mastery of an activity whose challenge is matched to personal skills can deliver a state of seemingly relaxed or effortless performance free of gross errors.

To find the right person, one could also structure inquiries of the candidate's basic views on "how the world works". An external view rooted in fat behaviors (Table I) can lead to the reliance upon and perpetuation of environmental dependencies found in most workplaces. Alternatively, one can probe to see if managerial candidates have views that are less dependent on external circumstances and can therefore structure their own experiences to result in greater happiness and productivity. In addition, does the candidate have the basic skills to reach the goal of being an effective manager, or instead a covert desire for self-aggrandizement? It is also interesting to know how managers spend their leisure time. Are they inactive – watch television after work or "do nothing" while on vacation – or do they apply their mind or body in hobbies or adventures? Autotelic personalities will tend to seek flow experiences in leisure activities where they are generally more easily accessible. It would also be interesting to evaluate candidates' requirements for approval from others, as this may uncover sycophantic behavior or a propensity for self-centeredness. In either case, they will have difficulty learning.

People with a propensity towards fat behaviors (Table I), and anger in particular, will not be capable of regular flow experiences, much less promote flow in others. Negative feelings will make it difficult to control thoughts and actions, or identify potential matches between challenging opportunities and their skills, because the mind is focused on the

many aspects of life that promote disorder. It is likely that one's emotional intelligence (Goleman, 1995) is a significant factor in determining one's ability to more regularly achieve flow in threatening environments such as the workplace. Emotional intelligence is the ability to control one's behavior to eliminate self-defeating impulses, to know when and how to express emotions, and to discern the feelings of others. It is an intelligence that is poorly developed in humans because our instincts, through evolution, have taught us to respond impulsively to threatening situations. No doubt this behavior can be valuable as it surely helped our ancestors survive hostile primitive conditions. But how well does poorly developed emotional intelligence carried over from primitive times serve modern civilized human beings with better-developed rational minds?

Emotional instincts are so strongly programmed into the basic structure of the human brain that we can evaluate a threat in a few milliseconds without conscious knowledge. Thus, defensive routines may be revealed well before a complete understanding of the magnitude of the threat is realized. Impulsive emotional responses have to wait for the rational, or thinking, mind to catch up to further evaluate the threat. A rational response may be appropriate for the circumstances if the delay is short and the threat is determined to have been overestimated. If, instead, the thinking mind later confirms the threat, then we should be thankful that the emotional response provided us with an effective early warning. However, a rational mind that is preoccupied by anger, frustration, low self esteem, anxiety, or a sense of victimization will have difficulty evaluating the threat, and any response is likely to contain a higher emotional content that could be too strong or off target for a given situation. The subconscious emotional memories retained from past experiences can thus work to either improve rational decisions, or lead to systemic difficulty in controlling one's response in stressful business settings.

Candidate managers could also be queried for emotional intelligence by probing their response to challenging situations. For example, what type of frustrating situations have they lived through? Can they stay focused, motivated, and maintain a positive outlook when things are not going well? Can they withstand sustained criticism from colleagues or learn from significant setbacks such as failure to achieve key business objectives. Are they able to control impulsive behavior? Can they delay gratification? The ability to manage one's feelings and to have

awareness of other's emotions are key competencies that are useful in any facet of life. These intra- and interpersonal skills can be developed through improved understanding and practice. It should thus be apparent that the functional skills required in business are but one of many forms of intelligence that must be mastered in order to be an effective manager (Argyris, 1994; Goleman, 1995; Goleman and Thurman, 1991; Senge, 1990).

Personal discipline

One of the most difficult challenges that a manager faces is maintaining control over his or her intra- and interpersonal behavior as the level of responsibility increases. The stress brought on by pressures to perform in a leadership role and meeting the expectations of others can be overwhelming at times, causing impatience, impairment of listening skills, preoccupations, loss of sleep, poor decisions, and inconsistent messages. In addition, the base of constituents that a leader must interact with can increase greatly, which usually results in less time to dialogue with subordinates. As a result, the manager can begin to lose touch with many important sources of feedback on business or personal performance. It is not long before the manager's behavior evolves to reflect their existence in a highly fragmented and competitive environment filled with colleagues practicing fat behaviors (Argyris, 1994; Emiliani, 1998).

The management styles of individuals, whether intrinsic to one's personality, learned from defective mentors, or the result of transformative leadership experiences, have been formally extended to the behavior of organizations and related to overall business functionality (Kets de Vries, 1989, 1993, 1994; Kets de Vries and Miller, 1984, 1986). The various modes of leadership can be characterized as manifestations of personal neuroses that will inevitably drive business strategies, operating methods, and organizational behavior. For example, a leader that views the world suspiciously can drive an organization to be paranoid and have low trust, which results in defensive behavior that searches for enemies to blame and punish. Dissenters are not tolerated, information is closely guarded, there are few rewards, and risk-taking is discouraged. A leader that seeks to control the organization will install bureaucracies rife with compulsive political behavior and where decision making is labored or conservative. The focus is inward and supported by extensive use of plans with numerous checkpoints. Managers are reclusive, and

subordinates work very hard to ensure there are no surprises. Overly narcissistic managers thrive on taking advantage of others and are preoccupied with negative emotions such as envy or revenge.

While not usually aware of their own shortcomings, these same managers are often acutely aware of the shortcomings of their business and the need to continuously improve strategies and organizational practices. However, the standard method for doing this is typically discontinuous and therefore often results in failure (Kotter, 1995; Strebler, 1996). For example, change programs are traditionally deployed by training large numbers of employees in the change initiative and its associated business case, then establishing rewards to deliver the intended results. Additional training is often provided in parallel to develop new behavioral norms, but this can be poorly aligned with the behaviors that must actually be used to get results in the expected time frame. Thus arises a tension between the "theories espoused" by managers versus "theories in use" by the organization (Argyris, 1994; Kurtzman, 1998). The resulting confusion can further develop personal habits better aligned with the "theories in use", which slows the change process and perpetuates fat behaviors. In the end, the business results usually prevail over the behaviors used to achieve them.

Institutionalized fat behaviors make change programs confusing because people are not sure when the old threats are really gone. It can take years for the organization at large to determine when it is safe to begin practicing the "theories espoused". An alternative course of action would be to align the business results with the espoused behaviors and give them equal emphasis in both measurement and reward. This will help ensure

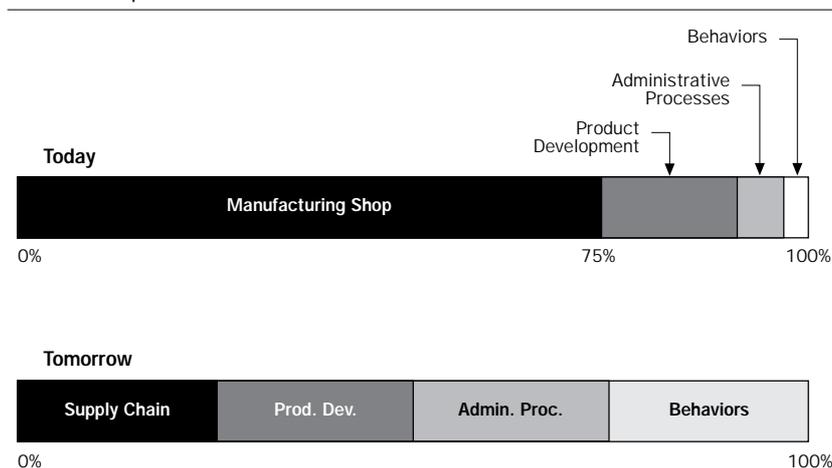
that results are achieved using the new behavioral model. However, the chance of failure remains high unless managers and employees understand the great individual effort that must be applied to become disciplined in the practice of lean behaviors. The effort should be no less intense than that applied towards achieving key business goals.

Managers are very fond of saying "the devil is in the details". This colloquialism traditionally assumes that the details pertain to missing data whose discovery and analysis would presumably help improve the business. This stems, no doubt, from a fixation on data and performance measurements due to heightened competition and the accessibility of personal computers with powerful easy-to-use software. The focus on metrics at the expense of resulting behaviors shows that many people can understand the details, but few are capable of understanding system-level interactions and effects. Perhaps the devil is actually in the details of how we behave.

People with both autotelic personalities and high emotional intelligence possess a high level of intrinsic personal discipline (Csikszentmihalyi, 1990; Goleman, 1995). For others less endowed, both attributes can be learned over time by those willing to seek the basic knowledge and develop their capabilities. In addition, minds can be trained to see waste in intra- and interpersonal behaviors; to be attuned to thoughts and actions that produce errors and waste time or effort. Reinforcing mechanisms such as role models or mentors and business goals aligned with behavioral goals will be needed. Without effective teachers to help people behave in ways that reduce waste, managers will simply add to the corpus of degenerate behaviors. Can businesses continue to focus on only part of the available opportunity for improvement (Figure 5[5]) and still claim success?

Managers that do not meet business objectives are usually set aside due to non-performance. Imagine the strong message that would be sent through an organization if managers unable to achieve at least baseline lean behaviors after reasonable time were also set aside. It is just too easy to find people that can force results using fat behaviors (Emiliani, 1998). Senior managers must recognize and improve their own behaviors, then take up the far greater challenge of finding and advancing larger numbers of people that can meet both business and behavioral objectives. Once lean behaviors are deeply understood, they must be practiced diligently under all conditions until they become

Figure 5
Focus of improvement



sustaining behaviors that replace old habits. The next task is to strive for perfection.

Conclusion

The intent of this paper is to show the tremendous amount of waste that normally exists in intra- and interpersonal relationships. The lean production model is used to highlight the required mindset and establish simple paths that can be used to minimize behavioral waste. It is a frontal assault on standard mental models that seek to strictly enforce local optimization. Like lean production, it is a five to ten year challenge for a well-established organization to develop even the most fundamental capabilities for sustained practice of lean behaviors. On a personal level, the transformation will take two to four years, but is no less challenging in the depth of personal discipline and perseverance required to achieve even baseline success.

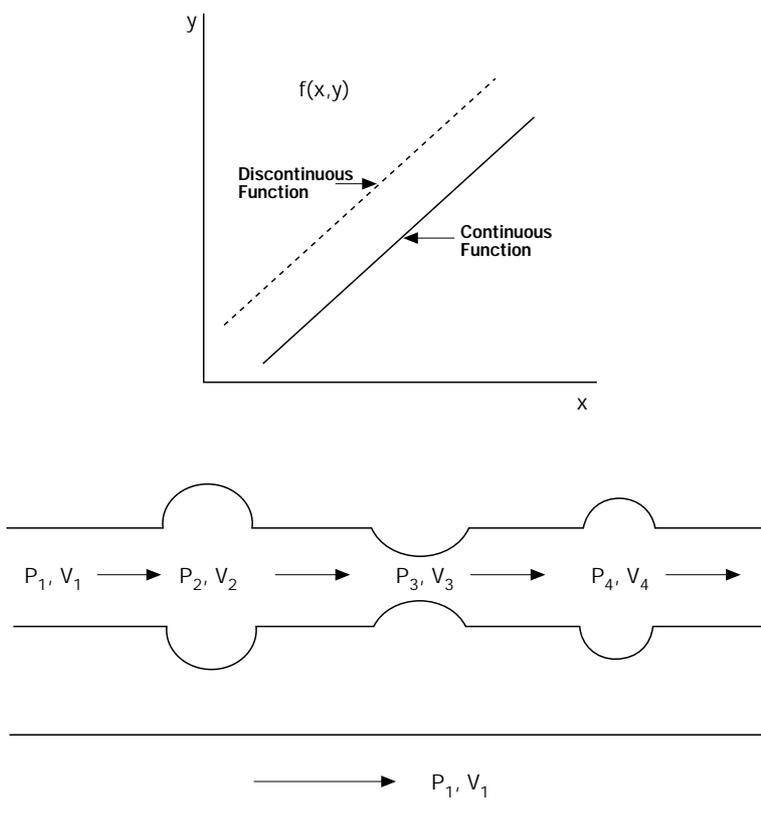
Fat behaviors will win over lean behaviors 100 percent of the time until enough people within an organization lose their tolerance for the massive amount of waste that fat behaviors produce. Can behavioral waste be completely eliminated? The answer is surely

“no”. In fact, disagreements and other types of interpersonal tension can be important contributors to creativity or the development of individuals, organizations, or products. Stated another way, “Are fat behaviors ever useful?” Perhaps, but they should be used sparingly, after very careful consideration, and only under restricted conditions, because they can be potent destroyers of trust, morale, commitment, and self-esteem. Fat behaviors prevent us from knowing many important things about ourselves and others. Ignorance of this information surely leads to significant under-performance due to costly delays, re-work, and poor co-operation. Managers have the prime responsibility to transform themselves and their organization from fat to lean behaviors. It is a challenge befitting the most well educated and highly compensated leaders in the workplace.

It is not inconceivable that someday investors, suppliers, customers, or employees will begin to question the cost or ethics of fat behaviors in a manner similar to recent stakeholder concerns about a company’s environmental record or their presence in countries that lack basic human rights. Critical stakeholders such as investors or employees may precipitate improved behaviors once they more fully comprehend its impact on financial performance or quality of everyday life in the workplace. No stakeholder, except for competitors, would be happy if they knew the costs added to the goods or services that they purchase due to fat behaviors. Customers, in particular, deserve to share in the gains from a company’s ability to practice lean behaviors.

Taylor said that his scientific management principles were no great discovery or invention (Taylor, 1967). Instead, it was simply the realization that better methods can be found by simply combining, classifying, reframing facts, and testing paradigms using the science of industrial engineering. Similarly, lean behaviors are no great discovery or invention either. It is simply the realization that individual and group behaviors can profoundly affect the prosperity of communities, and that better methods lie within the study of interdisciplinary subjects such as psychology, physical sciences (Figure 6[6]), management, economics, system dynamics, philosophy, and industrial engineering.

Figure 6
Possible analogs between human behavior and physical sciences



Notes

- 1 The stakeholder community consists of five interrelated elements: company, customers, investors, suppliers, and competitors. Each pair of interactive relationships is governed by formal and informal rules and processes (arrows). A clear understanding of the needs of

- each stakeholder will result in a more balanced approach to the solving of complex business problems. Employees within the company can also be viewed as investors, through long-term compensation such as stock options or stock-based savings plans, or through their investment of physical and mental energy.
- 2 The pressures of competitive environments, performance metrics, and institutionalized fat behaviors result in the display of few behaviors that actually add or create value. The goal is to maximize behaviors that create value and eliminate those that lead to waste. Caution must be applied to those behaviors that do not *appear* to add value but cannot be avoided. For example, informal conversations, such as workers chatting in the hallway, can solve problems, build relationships, and help people learn or gain shared understandings. Applying Taylor's scientific management principles to this type of activity, in an effort to measure and eliminate it, could be very unwise. The lean behavior model does, however, recognize that non-value added behaviors, such as occasional arguments or a "slip of the tongue", are part of human nature and can lead to important creative output. Thus, behaviors that add no value but cannot be eliminated may not be a strong source of opportunity for personal improvement for those not yet skilled in identifying waste.
 - 3 Batch and queue production (top) is a slow and costly method for producing goods because the large quantity of in-process material cannot move to the next step until the entire batch is completed. Workers perform a large amount of non-value added activity that can be minimized or eliminated such as parts transportation, multiple inspections, storage/retrieval, and time-consuming machine set-ups. In addition, a large amount of physical space is required to support this production method.
 - 4 A lean environment produces parts using a less wasteful form of production called one-piece flow (bottom). Equipment in the manufacturing cell is arranged in the sequence that the parts are processed. Each part moves to the next operation only after successful completion of the prior operation. Key features include quick change-over and rigorous preventative maintenance to eliminate unanticipated machine downtime. Results include less part travel, faster cycle times, shorter lead-times, fewer defects, higher inventory turns, higher cash flow, and lower cost.
 - 5 The primary focus of efficiency improvement efforts in manufacturing businesses has been the shop floor where many activities and outcomes are directly measurable - inventory, machine utilization, tooling expense, labor, etc. Only recently has business begun to understand the waste that occurs in product development, where design drives 80-90 percent of product cost. Design engineers far removed from manufacturing may not understand the impact on cost-quality-delivery of specifying expensive or long lead-time raw materials, tolerances that are not within the capability of standard equipment, or features that greatly exceed customer requirements. More recently, businesses have started to review administrative processes only to find massive amounts of waste there as well. Examples include unnecessary delays in processing sales or purchase orders, payments, and warranty or benefits claims. In the future, businesses should adopt a balanced approach for improvement of internal efficiencies, with a more even distribution of focus and resources. In addition, they must also recognize that 50-70 percent of the cost of manufactured products comes from external suppliers. Company resources should be applied towards improving supplier performance, in balance with overall needs and customer requirements. The development of human behaviors remains largely untapped in most businesses. Sustained practice of lean behaviors can propel further improvement in overall business performance by eliminating waste within functions and between internal and external interfaces.
 - 6 The top diagram shows the concept of continuity from a mathematical perspective. The dotted line exhibits sudden changes whose behavior is termed discontinuous. In contrast, the solid line behaves predictably in a continuous manner, thus simplifying efforts to find solutions. A continuous mathematical function is often said to be "well-behaved". The bottom diagrams represent the flow of fluid in pipes of varying and constant cross section. Fluid flowing in the pipe with variable cross-section undergoes numerous changes in velocity and pressure, as opposed to the pipe with constant cross-section. People whose behaviors are unpredictable, or discontinuous, force others to respond to sudden changes in direction or intensity. Solutions to management problems that cross interfaces (i.e. supervisor-subordinate, stakeholder, or functional boundaries) may be less vexing if the practice of lean behaviors can be practiced by individuals and then integrated into the organization.

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Application questions

- 1 Think of examples in your organization of "lean behaviors" and "fat behaviors" and consider why they have arisen that way.
- 2 The author has taken a manufacturing concept (lean manufacture) and applied it to personnel management. What other techniques from management (strategy, operations, marketing) might translate to behaviors?