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Vidal, Matt

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Between the Low Road and the High Road: Logics of Valorization and Regimes of Lean Production in US Manufacturing

Matt Vidal

King's College of London, UK

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INSTITUTE FOR RESEARCH
ON LABOR AND EMPLOYMENT
UNIVERSITY OF CALIFORNIA, LOS ANGELES

Bio

Matt Vidal is Lecturer in Work and Organizations at King's College London, Department of Management. Recent publications include "Postfordism as a Dysfunctional Accumulation Regime: A Comparative Analysis of the US, UK and Germany," *Work, Employment & Society* (forthcoming), "Low-Autonomy Work and Bad Jobs in Postfordist Capitalism," *Human Relations* (forthcoming), "On the Persistence of Labor Market Insecurity and Slow Growth in the US: Reckoning with the Waltonist Growth Regime," *New Political Economy* (2012), and "Sociological Institutionalism and the Socially Constructed Economy" (with Jamie Peck), in Trevor Barnes, Jamie Peck, and Eric Sheppard (Eds.), *The Wiley-Blackwell Companion to Economic Geography* (2012, Wiley). Matt is on the editorial board of *Work, Employment & Society*, and is Co-Editor of the "Organisations & Work" section of *Sociology Compass*.

Abstract

Lean production has become deeply institutionalized in the US manufacturing field, which is characterized by the dominance of two institutional logics of operational practice: a detailed package of lean manufacturing practices; and a high-road model of teamwork based on substantive employee involvement. Together, these logics specify a complementary package of practices widely considered to define world-class manufacturing and broadly adopted in American management discourse and practice. Based on interviews with 109 individuals and additional ethnographic observation in 31 firms, I find managers systematically deviating from one or both of the dominant logics. This raises a theoretical puzzle: In a competitive market, with a clearly-specified dominant institutional logic of high-involvement lean, understood as best-practice and well-known to all managers, how do we explain the persistence of diverse organizational forms? The manufacturing field is institutionalized such that there are few enforcement mechanisms associated with the dominant logics, making them effectively normative prescriptions. As managers confront the new logics in concrete practice, they bring to bear background knowledge and understanding based on past and present experience. In some cases, depending on their experience and aspiration level, managers define the situation through cultural frames that rationalize modification of the normative logic.

Keywords: Institutional logic, isomorphism, labor process, lean production, Marxism, polymorphism, postfordism, valorization, work organization

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Matt Vidal, Department of Management, King's College London, 150 Stamford St., London, SE1 9NH, UK; phone/fax: 0207 848 3884; email: matt.vidal@kcl.ac.uk. The research for this paper was made possible by a grant from the Alfred P. Sloan Foundation, with further support provided by the UW Center on Wisconsin Strategy (COWS) and the UCLA Institute for Research on Labor and Employment (IRLE). I would like to thank all of the anonymous participants who graciously agreed to offer their time and discuss their organizations with me, WMEP and Mike Klonsinski for helping me gain access to many of these factories, Paul Ericksen for help with access and numerous discussions on the

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From the 1980s through the early 1990s there was lively debate among scholars over which manufacturing model would be the successor to Fordism: the Japanese model of lean production or a more “human centered” model like those found in Germany or Sweden. By the late 1990s lean production had diffused widely throughout the industrial world, being adopted by Volvo in Sweden as well as major manufacturers in Germany, Western Europe and the United States (for a review, see Vidal 2011). Yet, although lean had become widely understood to be best practice, there continued to be variation in the exact configuration of lean practices implemented across organizations. A number of studies in various countries found a similar outcome: a common core of lean work organization practices were blended with host country human resource practices (Kochan et al. 1997; Adler 1999; Liker et al. 1999; Woywode 2002; Delbridge 2003; Elger and Smith 2005).

A particularly contentious issue regarding lean concerns employee involvement and work effort. Critics presented rich qualitative evidence that workers can experience lean as intense and stressful (Graham 1995; Rinehart et al. 1997; Rothstein 2006; Stewart et al. 2009). Yet, even critical scholars focusing on worker outcomes found that lean can be implemented in different ways (Adler 1995; Helper 1995; Vidal 2007b).¹ Research focusing on plant-level variations in teamwork explained variation by reference to differences in managerial priorities (Appelbaum and Batt 1994; Kochan et al. 1997; Bacon and Blyton 2000; Vidal 2007b). In the US case in the early 1990s, autonomous teams inspired by Swedish sociotechnical systems theory were still seen as a viable alternative to lean teams run by managers within a layered hierarchy and focused on standardization (Appelbaum and Batt 1994). Looking at the UK in the late 1990s, Bacon

and Blyton (2000) found that fully autonomous sociotechnical teams were quite rare, with teams generally being ad hoc mixtures of a number of team-related practices. Nonetheless, they empirically distinguished between high-road and low-road teams based on the mix of practices, most fundamentally the extent to which decision-making authority was decentralized.

In this article I build on these findings by drawing on institutional theory to explain variation in lean production regimes in US manufacturing, based on qualitative research in 31 manufacturing firms. My research took place in the early 2000s, by which time lean had become deeply institutionalized in the field, which was characterized by the dominance of two complementary logics of manufacturing practice: a package of lean manufacturing practices for process control, standardization and continuous improvement; and a high-road model of teamwork based on substantive employee involvement. The package of core practices together with the logic of substantive employee involvement is widely considered to be the most technically-efficient organizational form, universally adopted by high-profile, world-class factories, pushed on suppliers by industrial customers, industry associations and consultants, and well-understood by all of the managers and engineers I interviewed. Yet, I found managers systematically deviating from one or both of the dominant logics. This raises a theoretical puzzle: In a competitive market, with clearly-specified, complementary logics of high-involvement lean, understood as best-practice and well-known to all managers, how do we explain the persistence of diverse organizational forms, including less-lean regimes?

This article makes a number of contributions. First, following the call of Thornton and collaborators (2012: 141) for bridging institutional theory with practice-based

scholarship, I present an in-depth case study of manufacturing practice. By developing an institutional and cultural analysis of managerial decision-making, I hope to contribute analytical tools to help labor process theory and related approaches explain variation in the range of managerial approaches, from sweatshops and intensified lean regimes to more genuinely high-road forms. Second, Greenwood et al. (2011), suggested that normative logics allow organizational discretion because they are underspecified, whereas the contrasting situation is one of highly-specified institutional prescriptions that heavily constrain choice in organizational behavior. The US manufacturing field presents a distinct context that does not fit any of these expectations: the pair of dominant logics specify a package of complementary practices in detail. Yet, the manufacturing field is institutionalized such that there are few enforcement mechanisms associated with the dominant logics, making them effectively normative prescriptions, allowing organizational deviation from them.

Finally, in examining institutional logics that are not only highly-specified and normative, but also multi-practice, I contribute to institutional theory by showing how and explaining why actors invoke, elaborate and sometimes alter institutional logics through their material instantiation in concrete practice (Thornton et al. 2012: 128). I argue that it is useful to understand how managers develop a relatively coherent definition of the situation, including problems and acceptable solutions, by distinguishing between generic cultural frames and more specific perspectives through which generic frames are fleshed out to give meaning to a concrete context. As managers confront new institutional logics, they bring to bear background knowledge and understanding based on past and present experience. In some cases the normative logic is consistent with their

existing understanding, and thus the generic frame derived from the logic adopted wholesale. In others, depending on their experience and aspiration level, managers invoke a set of perspectives that elaborate a generic frame which rationalizes modification of the normative logic.

The article begins by constructing an analytical framework from institutional theory and a cultural satisficing model of managerial decision making focused on the labor process and the valorization process. I then begin the empirical analysis by examining the institutional sources of competitive strategy, including two complementary normative logics. I next present a cultural analysis of why some managers adopt one or both of the normative logics while others modify them based on alternative framing of the situation. From there I present a typology of four regimes of lean production based on the different configurations of the two logics, argue that the types are durable, discuss alternative explanations for the variation in lean regimes, and then conclude.

Theoretical framework

Managerial decision-making under institutional complexity

Institutional theory has recently begun to focus on how technical concerns with organizational efficiency become embedded in broader institutional beliefs. Even competitive market environments may be shaped by institutional logics, defined as “cultural beliefs and rules that structure cognition and guide decision making in a field” (Lounsbury 2007: 289). Critically, organizational fields may be institutionally complex, constituted by multiple, often conflicting logics, which may be combined, adapted and transformed by actors in concrete contexts (Schneiberg and Soule 2005; Kraatz and

Block 2008; Purdy and Gray 2009; Greenwood et al. 2011). Early contributions focused on how competing logics channel managerial attention. For instance, Thornton (Thornton and Ocasio 1999; Thornton 2004) examined how in the publishing industry an older “editorial logic” focused executive attention on the prestige of the publishing house, whereas the emergence of a market logic shifted attention to strategies of acquisition growth and marketing. Lounsbury (2007) showed how the rise of a “performance logic” of mutual funds emerged to rival an older “trustee logic,” shifting investor attention from product costs to fund performance. Other studies have focused more directly on the adoption of individual practices, such as Greenwood and collaborators’ (2010) finding that family-managed firms, operating according to a “family logic,” provided better job security than other firms operating based on a market logic.

In their recent review of these and other studies on institutional logics, Thornton and colleagues (2012: ch. 6) called for research on interrelated practices, particularly case studies of how logics are elaborated through their material instantiation in concrete situations. The implementation of lean production in manufacturing offers just such a case. To specify the analytical framework for this analysis requires clarifying the structure of the field and developing a model of managerial decision-making under institutional complexity.

Building on the work of Meyer and colleagues (1987), Pache and Santos (2010) noted that fields may be centralized, where there is a dominant actor whose authority is recognized and formalized, or decentralized, where there is no dominant actor with recognized authority to constrain organizations’ behaviors. Fields may also be more or less fragmented, depending on how many uncoordinated actors place demands on an

organization. Many fields are moderately centralized and fragmented, such as healthcare, law firms and mutual funds, and thus organization members face conflicting demands and institutional logics. Greenwood and collaborators add that institutional demands may be more or less formally organized. They also bring up the critical issue of enforcement mechanisms, arguing that these may differ by node of authority (Greenwood et al. 2011). Because the manufacturing field is decentralized and informal, at least with respect to logics of operational practice, there are few enforcement mechanisms, making the dominant logics effectively normative.

Thornton and Ocasio (2008: 106) argued, following March and Olsen (1989), that normative behavior is driven by a logic of appropriateness rather than a logic of consequences, and that “norms imply ambivalence about universalistic principles.” Following this line of argument, Greenwood et al. (2011), proposed that normative logics allow organizational discretion because they are underspecified, in contrast to highly specified institutional prescriptions that heavily constrain choice. In the US manufacturing field we see another outcome: the pair of dominant logics specifies a package of complementary practices in detail, yet they remain normative because there are few effective enforcement mechanisms. The normative logics are defined at a level of specificity regarding operational practice – process and routine – beyond the reach of market selection pressures, because there are ways organizations can produce satisfactory output without adopting the normative practices whole-cloth. In this regard, the field is also characterized by a degree of fragmentation: as I will show empirically, managers in component suppliers understand the normative logics, but their industrial customers are generally only concerned with outcomes (price, quality and delivery), not with internal

organizational processes. Thus, competitive pressure does not penetrate deeply to reach organizational routines. Additionally, many suppliers are in long-term forms of relational contracting with their industrial customers that mitigate competitive pressures.

The remaining issue concerns how organizations react to the normative logics in practice. Institutional logics provide cultural resources for understanding concrete situations, including both how problems are defined and what solutions are regarded as acceptable (Ocasio 1997; Thornton and Ocasio 1999). But logics do not determine behaviour, for example by providing detailed behavioural scripts, because goals and schemas are elaborated and concretized in particular contexts (Thornton et al. 2012). When institutional logics are invoked in practice, they may guide action directly through relevant schemas or frames, but may also be modified or translated (Saka 2004). In the case of highly-specified, multi-practice, normative institutional logics, to understand how and why managers adopt them as such, modify or deviate from them requires delving more deeply into the social psychology of managerial decision making. In order to do so, I return to behavioral theory, which provides a natural microfoundation for institutional theory (Ocasio 1997; Thornton and Ocasio 2008).

For March and Simon (1993: 8), individual behavior is shaped both by the definition of the situation and by aspiration level. On the latter, they argued, even when operating according to analytic rationality humans often do not systematically consider *all* alternatives and their consequences as in a maximizing model; rather, the logic of consequences “operates principally through selective, heuristic search among alternatives, evaluating them for their satisfactoriness as they are found.” Considering variation across individuals, those with moderate aspiration levels may define a given situation as

satisfactory, while those with higher aspirations may define the same situation as unsatisfactory. But this satisficing model of decision-making is underspecified in terms of how individuals define their situation (Thornton et al. 2012: 95).

In defining the situation (and the fit of the normative logic to it), individuals draw on their existing collection of cognitive schemas, cultural frames, beliefs, opinions, images and so on, which may be inconsistent and relatively unorganized (DiMaggio 1997). While institutional logics often provide material for schemas and frames, when individuals confront new logics these may be more or less consistent with their existing cultural-cognitive toolkit. In concrete situations, individuals must develop a relatively coherent definition of the situation. I argue that it is useful to distinguish between generic cultural frames and more specific perspectives through which generic frames are fleshed out to give meaning to a concrete situation. Tomasello (1999: 95, 166-171) argued that an important characteristic of symbolic representations, such as schemas or frames, is that they are perspectival, that is, they shape the way particular phenomena are viewed. In some cases conceptual perspective-taking is a form of categorization (e.g. a person, a worker, an employee of a particular company, George, etc.), but in other cases perspective becomes a form of disagreement based on different knowledge or understandings of a situation.

The analytical distinction between frame and perspective is meant to highlight the fact that a generic frame can be based on more than one specific perspective drawn from background knowledge and understanding, in which the perspective provides a more detailed *rationale* for a generic frame. Further, aspiration levels may come into play, contributing to whether a particular situation is framed as satisfactory or not. I use this

cultural satisficing model to explain how managers define their situation, bringing to bear particular perspectives, based in their organizational experience, that frame their situation either adopting the normative logics as such or modifying them to fit an alternative frame/perspective. With this framework in mind, I now turn briefly to labor process theory to conceptualize the scope and dynamics of the operational questions at issue.

The postfordist labor process

Labor process scholars have long observed that a central problem for management is the extraction of labor effort and that managers have multiple devices for labor control, from Taylorism to “responsible autonomy” (Friedman 1977) and beyond (Thompson and Smith 2009). Marx (1990 [1867]: 293, 450) distinguished between “a social labor process for the creation of a product” and “capital’s process of valorization,” arguing that the capitalist “process of production must be a unity, composed of the labor process and the process of creating value.” Adler (2007: 1324) has recently argued for a reconstruction of labor process theory along these classical lines, noting that Marx saw the contradiction between these two processes as a fundamental dynamic animating all forms of capitalist production: “they are simultaneously part of the productive forces (as techniques for organizing cooperation in the labor process) and part of the relations of production (as means of coercing effort to valorize invested capital).” Adler argued that valorization pressures stimulate the “progressive socialization of the labor process” – that is, force firms to develop new technologies and organizational forms, to integrate production and expand markets – but also have detrimental effects on the labor process and workforce

because the pursuit of exchange value, of profit, takes place without regard for use values, workers or communities.

In the Fordist era, the question of valorization revolved around the problem of managerial control: Is the best way to extract effort through Taylorist deskilling, technical control or bureaucratic control? In the postfordist era, where employee involvement is a core strategy, the issue becomes more complex. Levine and Tyson (1990) distinguished two forms of employee involvement: Substantive participation involves regular involvement in problem-solving and decision-making activities. Consultative participation involves actively seeking of input from workers but without giving them effective authority to engage in decision-making. Each constitutes a distinct logic of valorization and I will attempt to demonstrate that substantive participation is the normative logic in the US manufacturing field. In terms of the broader labor process, managers must also make a decision as to which package of practices to adopt beyond the question of employee involvement.

Data and Method

The data presented here are based on semi-structured interviews with 109 individuals in 31 firms and additional ethnographic observation. The firms compete in the durable-goods sector in the US Midwest. Seven of the firms are multinational prime contractors that each do over one billion in sales per year, 23 are small and mid-sized supplier firms, and one is a large firm that is a supplier of plastic parts but also produces a line of brand-name products. The prime contractors sell air conditioners, engines, trucks and agricultural, lawn, recreational, and industrial equipment. The suppliers sell a variety of

metal forgings and fabrications, plastics, and subassemblies to industrial customers across a wide range of durable goods industries, from cars to computers. The management interviews were typically around two hours each, with some going over three hours in multiple sessions, and the worker interviews were typically half an hour, with some extending to an hour. I received plant tours in almost all cases. I also spent additional time in the field doing ethnographic observation on 54 distinct occasions, including observation of meetings, training sessions, and so forth.

The 31 firms were *not* picked based on their operational strategy – that is, whether they adopted lean production – but were picked based on industry and location in the supply chain, using cold calling and snowballing techniques. My goal in picking the cases was to get a reasonably broad cross section of factories in what may be considered the components subsector of durable goods manufacturing, that is, the generally small to mid-sized firms that supply components to prime contracting firms. My interviews with the primes focused largely on supply chain management, and interviews with the suppliers on work organization. The focus of this article is work organization in the 24 supplier plants, although I also draw from interviews in the prime contractors, who are customers of the suppliers I observed. With a few exceptions, the interviews were recorded and transcribed. The transcriptions were then coded into Nvivo qualitative software for analysis.

I went into the field using the principles of the extended case method (Burawoy 1998), by which I intended collect qualitative data to interrogate and advance labor process theory with thick description, which would generate need for theoretical reconstruction. However, as data collection continued it became clear that labor process

theory alone was not sufficient to explain the wide range of variation I found. As I continued to collect data I turned to institutional theory. However, since I began looking at institutional theory as a way of explaining my data quite far into my data collection, it would not be correct to say that I have followed a strict extended case methodology with regard to institutional theory. While my research is heavily theory-driven, I engaged in a form of analytic induction in attempting to make sense of my rich qualitative data, by sorting the data into types and seeking to understand them through various rounds of progressive conceptual redefinition and theoretical reconstruction. This process happened both as I was in the field, increasingly honing my questions to informants, and after data collection ended. For the entire research project, I generated 77 codes within Nvivo, some of which were empirically generated, some theoretically generated.

Institutionalization of the US manufacturing field

Institutional sources of operational strategy

Of the 24 supplier plants I observed, 22 had adopted lean manufacturing. As I will show in detail below, all were well aware of the complementary normative logics of lean. Major sources leading the 22 suppliers to lean are listed in Table 1. Fifteen of the 22 lean suppliers were pushed to get lean by a major industrial customer and three by a parent company. Of the remaining four, three received lean training from a technical college and/or Manufacturing Extension Partnership center and the fourth received lean training from an industry association. The MEP, a program to help small and mid-sized manufacturers, is partially funded by the National Institute of Standards and Technology, and there were around 60 state-level offices covering all 50 states at the time of the

research. Of the two plants that did not adopt lean (not shown in Table 1), one was a metal fabrication job shop that had reduced its batch sizes and recently began looking at improving plant layout and workflow, but “has been a pretty traditional company over the last 95 years” and was not looking at any form of employee involvement; the other was a painter with a continuous-process technology that largely constrained its ability to implement lean workflow.

[TABLE 1 ABOUT HERE]

A normative logic of lean production

The top section of Table 2 shows many high-profile prime contractors who have publicly embraced lean and are key customers of the suppliers that I observed. It also lists the range of industry associations that have explicitly adopted lean as the basis of modern manufacturing practice, along with a cottage industry of consultants. Particularly important in the latter regard are the MEP centers, which provided lean consulting services to 12 of the suppliers I observed. Lean practitioner gurus, consultants, business associations and government agencies have all converged around and worked to diffuse a well-specified model of lean production. Figure 1 presents a model of the “House of Lean” as developed by the Wisconsin Manufacturing Extension Partnership, a figure that is widely reproduced in various forms by any number of consultants, associations and agencies. A simple search on Google Images for “House of Lean” generated seven identical versions of this figure produced by other consulting organizations, and no less than 60 more versions that were nearly identical or very similar to it, with all including a

core set of practices such as workflow and pull production, batch reduction/just-in-time, standardized work, continuous improvement (*kaizen*), and teamwork.²

[TABLE 2 AND FIGURE 1 ABOUT HERE]

All of the managers I spoke with had a good understanding of this normative model of lean as specified in Figure 1. Of these, perhaps the most basic lean practice is *batch size reduction*. One of the central ways of reducing batch sizes is with *quick changeover* methods, also known as setup reduction. If a factory wants to reduce its batch sizes it has to reduce the time it takes to changeover its tooling: the longer a setup takes, the larger the minimum batch size required to justify it economically; the smaller the batch size, the wider variety of batches that can be run in a given shift.

Another practice adopted at every single factory was the *5S system* of standardization, which roughly translates into sort, set in order, shine, standardize and sustain. The managers at Industrial Pumps explain how effective 5S can be:

Manager 1: We pulled seven Craftsman toolboxes out of just that assembly department down below the steps.

Manager 2: Three guys working the area, seven toolboxes!

Manager 1: If you'd go up and you'd ask a guy for a torque wrench, he'd go through three drawers, or four drawers.

Manager 2: Unlock the drawer, look, no. Unlock the drawer, 'There's the case. There's no torque wrench.' That was the area we did our first 5S ... There was a complete set of metric wrenches and a complete set of English wrenches. And out of all of that, found out you don't even need a wrench to build the pumps they built. So seven sets of wrenches went on the auction block.

This is related to another lean practice, which, as the plant manager of Integrated Blinds explains is “*Quality at the Source* teaming with best practice work instructions for every work center.” In addition to standardized work, lean practices for quality at the source include *point of use storage (POUS)* and *total productive maintenance (TPM)*, in which machine operators do simple maintenance to avoid unplanned downtime.

Beyond the foregoing basic lean practices, adopted by all of the 22 lean factories I observed, the other lean practices get significantly more complicated and were variably implemented across firms. These are number of practices for improving *plant layout* and process control, including *pull/kanban* and *cells* or *cellular flow*. The idea is to move from traditional Fordism, a push system based on long-range forecasts, to a pull system driven by customer demand. Ideally, a pull system is a continuous flow process. To establish true continuous flow requires a *kanban* system of production control. A *kanban* is a low-tech indicator system developed at Toyota, either a card or a container that is a signal to build for an upstream operation. In the leanest systems, a sequence of operations can be scheduled at a single point, based on customer demand, and then have the entire sequence controlled via *kanban* signals. Supplier factories, which typically do not run long assembly lines, tend to organize continuous flow production through work cells. The basic idea behind cells is to move from the functional organization of traditional

manufacturing, with distinct departments for machining, stamping, metal forming, welding, etc. to organizing the factory on a product-focused basis, such that all of the machines needed to produce a product family are organized in close physical proximity to each other.

As suggested in Figure 1, *value stream mapping (VSM)* provides the steps to realize all these practices. It is a form of process mapping, which in some factories was based on detailed analysis of processes and in others quite crude. Sophisticated forms of value stream mapping provide a basis for continuous improvement, which is often known by the Japanese *kaizen*. As the plant manager of Second Tier Specialist explained, “What we do is we focus in from value stream mappings on where we need to target to get the biggest bang for the buck for the *kaizen* activities.”

Together, the entire set of practices just discussed – understood explicitly as a complementary package – constitute the normative logic of the lean labor process. The final lean practice is teamwork. Because it concerns employee involvement – hence the locus of control over physical and intellectual output – it is best conceived as a question of valorization, distinct from the question of which other organizational practices to implement. I argue here that the normative logic of valorization in the US manufacturing field is one of substantive participation of problem-solving and decision-making (rather than consultative participation). While teamwork in Japanese organizations is organized to heavily encourage front-line workers to give suggestions for improvement, particularly through quality control circles, they remain extremely hierarchical, with *kaizen* being driven by engineers, supervisors and sometimes skilled maintenance

workers, but with front-line workers excluded from decision-making (Marsh 1992; Adler and Cole 1993; Masami 1994).

In the US field employee involvement has taken on a substantive cast, both in discourse and the practice of leading companies. In response to widespread labor unrest beginning in the early 1970s, US business and labor began to experiment with Quality of Work Life programs, which took off slowly but were widespread by the early 1980s. While these programs most often remained consultative in practice, the rhetoric of employee participation “permeated” the field (Fantasia et al. 1988). It was in this context that Krafick (1988: 43) introduced the concept of lean production in a 1988 issue of *Sloan Management Review*, a popular management journal that caters directly to practicing managers, writing that Toyota managers gave workers “responsibility to continuously improve performance.”

Writing in *Sloan Management Review* a few years later, Adler and Cole (1993: 86) reported on the high-profile NUMMI joint venture between Toyota and GM in California, noting that while teams in this lean system are not “self-managing teams so popular in the United States today,” they are a form of “democratic Taylorism.” That is, while workers did not have individual autonomy because lean is based on short cycle times and extreme standardization, at NUMMI workers were substantively involved in problem-solving and decision-making with regard to work redesign and standard setting. This emphasis on a substantive participation as central to lean production continued to be emphasized in the US field, particularly through the concept of “worker empowerment,” which can be found in an endless number of lean consultant programs, including the “14 Principles of the Toyota way” advocated by lean guru and consultant Jeffrey Liker (2004).

Permissive institutionalization of a competitive field: Embedded subcontracting, complex organizations and managerial satisficing

The bottom half of Table 2 lists two ways in which the manufacturing field becomes institutionalized through complex relations within and between organizations that contribute to the fragmentation of the field and lack of effective enforcement mechanisms for the dominant logics: embedded customer-supplier relations and satisficing among purchasing managers in complex multinational prime contractors. Taking the latter first, I was told numerous stories about how purchasing agents are often concerned only with getting parts of sufficient cost, quality and delivery, with little concern for how these targets are achieved. At the end of the day, purchasing agents are there to get parts of good quality at the right price and the right time, and it is beyond their departmental purview how exactly these targets are met. From the perspective of a manager in one supplier: “You’ve got purchasing people doing the buying, they’re not really looking at processes and what can they do to shave 50 cents off here or 50 cents off this part. They’re just ordering parts.” A manager in a different supplier concurs: “Once a part is being made and there’s no problems with it, and it’s going through, you know, they’re getting their parts on time and it’s working fine, I think there’s little incentive for them to say, ‘How can we improve the process?’”

The second institutional mechanism creating space for managerial discretion is long-term customer-supplier relations. What in industry are referred to as commodity products, like screws or simple fabrications, are typically subject to spot market-type competition. But as a manager in a supplier explained, purchasing departments may offer

some wiggle room for existing suppliers of highly-engineered products: “In some ways, once you’ve won the business, unless you just absolutely falter because of quality or delivery or whatever, you’re married to that particular design or that particular engine, because it’s a huge investment.” Even on price, embedded relations can shield suppliers to a certain degree. In some cases it’s hard for customers to easily switch suppliers. For example, the plant manager at an iron casting plant explained that it is difficult for customers to switch suppliers because it takes so long for them to qualify casters for the specific part his plant supplies and, moreover, their tooling is expensive and their volumes are low. Tooling for an automotive block can cost up to \$200,000 and most prime contractors “don’t have the capability of taking the tooling out of here and taking it to somebody else that they don’t have qualified and spending five, six months bringing them up to speed.”

Competition can be intense, but it is structured in various ways by highly complex and differentiated organizations staffed by satisficing managers and in long-term relations with other companies. Ultimately, despite competitive pressures to improve cost, quality and delivery by getting lean, the signals that managers in supplier plants receive are often mixed. For example, the pressure to do just-in-time delivery may be relentless, but managers may get mixed signals regarding whether their industrial customers want them to hold inventory to be responsive or to actually lean out their own operations. As explained by a manager at a different caster, his firm was able to focus in the face of mixed pressures, in contrast to other suppliers, who “listened to this customer say, ‘You’ve got to put inventory in.’ So they put inventory in. ... Instead of doing it the right

way, which is eliminate all inventory.” Especially when business is good, managers may opt for satisfying current, major customers in any way they can.

Lean production in practice: A cultural analysis of practice variation

Implementing the normative logic of valorization: Substantive employee involvement in practice

The issue of extracting labor effort – valorization – is central to understanding a core managerial problem under postfordist production in the US: How to best harness the experiential (tacit and explicit) knowledge of workers, and how to balance the attempts elicit mental effort with relentless pressures to ensure the extraction of physical effort?

The generic frame associated with the normative logic of substantive participation is that “workers can self-manage.” In my findings, three more detailed perspectives underlie this generic frame: that front-line workers have critical information about work processes, that workers are capable of self-management in the interests of the firm, and that a real devolution of decision-making authority improves worker loyalty and satisfaction, hence performance. In all cases where managers adopted the normative logic of substantive participation, each had very high ambition levels, clearly displaying an understanding that substantive devolution of authority is by no means a simple process but requires a determined approach to training and, in a context where workers are typically given more responsibilities without increased remuneration, facilitating cultural change.

The Owner/Vice President of Inspired Castings, who had a very-hands approach to his firm, expressed the first perspective that workers have critical information, when I asked him where the initiative comes from for continuous improvement in his factory:

“It’s better coming up from the shop floor,” he replied, “because then they can fix it and all that. And a lot of times we’ll put the problems back and challenges back to them: ‘Here, solve this problem. Work on this one.’” He went on to explain that he actively sought to hire “people that want to make decisions and want to be involved.” The goal is to encourage a systematic culture of substantive employee involvement: “On a small scale, [a team] can start something up [in] the cell and they can work on something themselves, or ... the whole plant can work on it, or set up a team that’s separate on that.” The personnel manager went on to reveal a second perspective, that workers are capable of self-management in the interest of the firm. I asked her about employee involvement in problem-solving teams:

Do you know how often the shop floor employees would be involved in something like that?

Well, you can have many going on at one time, and I wouldn’t even be aware of them. Some of the employees in Module 1 at one point in time had a real interest in the grind area and knew how they could streamline it and make it better. They talked to the plant manager. ‘Fine, go ahead. Start working on it.’” They’d come in and work on things here and there.

They’d just come in and do it on their own?

Um-hmm. And then they came up with some programs to really help the process, implement it, reduced times drastically, you know, in setups and things like that to standardize stuff.

As the last quote about standardization illustrates, these managers, who had surveyed best practice in the field and accepted the normative logic of the lean labor process, implemented substantive participation within this framework, allowing no room for individual autonomy. In contrast, LV Gaskets was one of two factories where plant management framed substantive participation in terms of individual-level autonomy to a degree that limited the extent to which they engaged in lean standardization practices. In this case, the plant manager explained that this framing comes from his company's corporate policy of participatory management:

Employees know their own 25 square feet, which was sort of a 'Don't mess with them; they probably know the best way to do it.' You know, it doesn't mean because you're an industrial engineer you're really going to be able to go in and say, 'Matt, you ought to do it this way.' You know, Matt may not be at all comfortable doing it that way.

His experience with the company style gave him the third, perspective that individual autonomy generates loyalty, which is good for the firm, hence leading him to implement the substantive logic of valorization in way that conflicts with the normative logic of the lean labor process. As he explained, "I think that's some of the entrepreneurial style that has been good for [the corporation] over the years and has kept a lot of people in [it]. We've got a lot of long-term employees in [the corporation], probably much more so than a lot of big companies."

The perspective that workers have critical information was also seen at Industrial Pumps, where the plant manager explained that their goal is to encourage teams to

engage in worker-driven experimentation for process improvement, without having to go through the plant manager or the engineers:

There was a lot of micromanaging here for a long time, and it was really hard for a lot of people on the floor to feel comfortable sticking their neck out to do something when they knew, all the way up the chain, everybody was sitting there staring at that one little detail today. You know, you couldn't make a little mistake because you would stand out. And it's going to take a while, but I would love to see us get that comfort level ... so [the value stream leader] can feel comfortable saying, 'Hey, I think we want to try this.' And we can say, 'Well, if you've got to have a day to do it, do it.' And get the guys together and do it. And not worry about, 'Should we let X know that two weeks from now we're going to take two hours to teach these guys this.'

This quote also encapsulates the perspective that workers are capable of working responsibly without management oversight – if they are given the chance – and it also illustrates a high level of managerial ambition. When I asked specifically about self-directed teams, he elaborated on the problems of such dramatic change:

Well, we actually did it. [Laughs] And it blew up in our faces.... Took completely the wrong approach at doing it by just throwing it down on paper and saying, 'Let's split the place up into four teams and that's that.' ... So we've taken it a step, I wouldn't even say back, we just, we took a different step now. We're trying to get, first, let's get some strong leaders and get them the support and training and let them learn what they need, and then we'll look at taking another step later.

Deviating from the normative logic of valorization: Logic hybridization and satisficing

A second set of managers deviated from the normative logic because the cultural frame through which they understood the situation was inconsistent with the normative logic. In particular, they framed the situation generically as “workers need to be managed.” In most cases this frame was fleshed out with a perspective that although some workers may have good ideas, most workers are not good with managerial responsibility and thus decision-making responsibility should be reserved for managers. In one case, a manager adopted a slight variation on that perspective, which was that workers do not want responsibility. My data suggest that this deviation from the normative logic is mainly a top-down process emanating from conflicting institutional logics in the field, where managers continue to frame the situation by blending the previous normative logic of Taylorism – workers are “recalcitrant and irresponsible” (Adler and Cole 1993: 90) – and the new logic of substantive participation, leading to a hybrid logic of consultative participation. In this case, managers have accepted that workers may have good ideas to contribute, but view workers as either irresponsible or, less common in my findings, uninterested in more responsibility. However, there is also something of a bottom-up process (Thornton et al. 2012) going on here, which is that performance improvements in the context of moderate aspiration levels may lead managers to reframe their approach in a way that rationalizes deviation from the norm. Framing and moderate aspiration levels surely interact in complex ways but, unfortunately, my data cannot fully disentangle this fundamentally important issue, which will have to await future research.

Custom Blinds offers an example of continuous improvement being heavily management-driven. The plant manager's description of the process illustrates an approach in which the situation is framed implicitly as "workers need to be managed," explicitly showing the perspective that decision-making responsibility should be reserved for managers:

We have manufacturing engineers ... they are to be out here on the floor, working with the supervisors, talking to the associates on the floor, looking at a piece of equipment, how can they make that more efficient? Obviously you have to look at the costs of doing this, but there are things that these two guys have in their head that just amazes me. ... If nothing else, if you can make it more ergonomically friendly for the associate, you still have a best experience because the associate's happier, okay?

When I asked the plant manager what were the main ways for workers to give input, he responded

It's not designated that they have to go to a specific person. It's really going through their elite person on the floor, going through their supervisor, or stopping an engineer as they're walking down the aisle and saying, 'Well, Jim or Daryl, what do you think about this?'

At Custom Blinds it seems that the hybrid logic of consultative participation, as such, has been the driving force in the interaction between frame and aspiration. In contrast, managers at Metalfab Plus also understand their situation through the frame that

workers need to be managed, but in this case a moderate ambition level appears to loom larger. The plant manager explained that he's "sent four or six of our managers to WMEP for the Lean Manufacturing thing and I want to get the rest of them there." This was a common finding: managers deviating from the normative logic only sent managers to lean training, in contrast to managers adopting the logic of substantive participation, who sent their entire workforces to lean trainings. Again, this is a very management-driven approach to lean:

You guys haven't gone to any teamwork or anything like that?

Well, we've had different forms of it, in terms of what, again communications is ongoing. We have monthly meetings with departments. When we have problem situations it's not unusual to bring the employee in, or the employees that do well, and do that.

Now do you have regular team meetings with them?

We haven't. And when we have, used to have them quarterly, and we're going to work towards having the managers meet with the employees every week for 15 or so minutes.

While the plant manager did state that "We have to remember that our employees are our biggest assets," he clearly took the perspective that some workers may have good ideas, but decision-making is primarily for managers. They did have a smaller factory with a few dozen utility workers, that is, highly trained, multi-skilled workers given managerial responsibilities. But in their main plant, with over 400 employees, he explained that they

do not use *kanban* control in because “there’s a discipline behind that ... not just for resizing but also when you get that signal; a *kanban* is a signal to build. If we don’t build within that timeframe, we’re going to be shutting down that next operation.” They did not plan to push forward with *kanban* control in the larger factory, thus, a consultative logic of participation effectively stopped them from more fully implementing lean. In terms of aspiration, this view suggests that the manager is aware of how much work it would be to devolve substantive responsibilities to the large workforce, and is therefore content to implement lean practices selectively. There is a certain rationality to this position: if a modified logic produces good enough changes, why go through the trouble of more thorough change in authority structure, risking disruption of a good-enough system?

The plant manager at Deep Stampings offered a distinct perspective on the generic frame that workers need to be managed, namely, that some workers do not *want* the responsibility:

You know, if you have a sharp operator who has an aptitude and an interest and maybe has been here awhile, and depending if the toolmaker is willing to mentor that person, you know, they'll let them do more. They'll look over their shoulder. But you have other operators, they just want to operate, you know, ‘Just let me do my job. I could care less about how that tool works or what you do,’ and that works too.

The observation of this plant manager that some workers do not desire the responsibility is sound; as I have shown in an article focusing on workers, there is a distribution of orientations toward work, and some workers indeed find the “opportunity to participate” a stressful obligation they do not want (Vidal 2007a). As such, deviating

from the norm may be good management in this respect. For the present argument, however, what this case does, when contrasted with other cases, is highlight how aspiration level and framing of the situation may interact in complex ways that render problematic any attempt to judge whether a given strategy is rational and efficiency maximizing. Thus, while this manager (as well as the plant manager of Metalfab Plus) may have a well-reasoned argument for adopting a consultative logic, I fully expect that other managers I observed, given their experience, perspective and ambition, would have forged ahead pursuing a substantive logic of participation in these plants. This, of course, is a counterfactual argument, but I believe the cases discussed above, are similar enough contexts to provide some support for the argument. Deep Stampings has 300 employees, and Metalfab Plus 450, but Inspired Castings has 650 and they continue to press forward with widespread substantive participation in their factory. Management at Industrial Pumps and other factories I observed persevered with radical restructuring, including widespread substantive participation, despite numerous setbacks, including reticence and sustained resistance from the workforce (Vidal 2007b).

Implementing the normative labor process logic: Lean-as-system in practice

In terms of the broader labor process, I found two closely related generic frames associated with the normative logic of lean. The first is that “lean is a system,” a frame fleshed out with a perspective that to get it right one must fully commit to the system on its own terms. A second generic frame is that “lean is a journey.” While this is a common frame that may be widely adopted at a rhetorical level, those who implemented the

normative logic in practice adopted a perspective elaborating this frame, that implementing the full system is a hard, ongoing process, but worth the effort.

The plant manager at Second Tier Specialist illustrates how doing “lean as a system” requires understanding “lean as a journey.” In particular, he explains how implementing lean as a system requires a routine use of value stream mapping to engage in truly ongoing continuous improvement, and how doing so requires a disciplined, dedicated approach to cultural change among front-line employees:

Before me the process was dictated from above. Now I let them know what we need help in and we work together. So it’s going over much better than the dictated approach which was going on before I got here, and that was very clumsy and met with a lot of resistance from the shop floor, which I fully understand. The company did a crappy job of implementing *kaizen* in the first place. First it was *kamikaze kaizen*, where they would swoop in and look at a particular machining center and people wouldn’t know in advance.

Under his management, the *kaizen* events include cross-shift groups of workers, and they focus on a range of activities, including *kanban* systems of inventory and production control:

A *kaizen* event is typically a multiple-day event. It may not all get completed within that time period, three for four days. But at least you’re identifying everything that needs to get done, itemize the tasks. You have a goal you’re trying to solve, e.g. maybe we’re setting up a *kanban* system for the raw inventory for Cell 2, or we might be doing a setup

reduction on a LC30 or LC40 [CNC lathes]. It's very specific and you know what you're trying to do, you're trying to reduce your setup times by 50%. And you get a group of people from first and second shift, hopefully, to work together for that event.

Finally, the following comment from the same plant manager illustrates the perspective that to get the lean system right, one must fully commit to the system on its own terms. In particular, he explains how a lean system requires managers and workers to give up a traditional emphasis of Fordist manufacturing – maximizing output on individual machines as a primary source of efficiency (economies of scale) – in favor of a lean view, which is to focus on flexibly responding to customer demand:

In the past you would have measures such as optimum up time on a machine, you know, how much is that machine running. Who gives a shit? Do what needs to be done to get the orders out, don't make extra inventory unless you absolutely need it, because you can't replenish those particular parts within the lead times you need to get your product to your customer. It's a moot - train your workers so they move to where the work is and perform the work you need, don't have them doing work that doesn't need to be done right now.

The plant manager at Designer Railings invoked the lean-as-a-journey frame explicitly, noting that it is a tough journey, which must be taken step-by-step: “there's all the wonderful watchwords, you know, it's a journey not a goal – but if it's true, you know, and you talk about, you know, we'll make it better and then we'll make that better, and we'll make that better, you've got to get to the first better.” He went on to describe their

first step, which was implementing their first cell, demonstrating the perspective that while it is a hard, ongoing process, if done right it is worth the effort:

We made that just a study in how to, it was our first manufacturing cell. It used to be we cut the product over in the saws and we bent it over in the benders, and we flattened it over in the press department, and then we sent it back to get it trimmed over here, and you know, then it was reworked over there, kind of thing. And you know, it was a 10 or 12 step process that we got down, that took literally weeks to get through the shop. And we got it to the point where we cut it, we bend it, we flattened it, we trimmed it and we put it in a box, almost as fast as I just said that. It was: pull the pipe through the die, hit the thing that cuts it off, stick it in the bender, bend one side, flip it, stick it in the bender, bend the other side, and flip it, flatten it, trim, trim, pull. We got it down to less than a minute a piece. And it was continuous flow. And that's been phenomenally successful.

Similarly, the plant manager at Custom Seats implicitly invoked the frames that lean is a system and lean is a journey as he described some of their problems of implementing lean in a context that others (discussed in the following section) have deemed too unique and complex to fully implement lean as a system, namely in a low-volume, high-mix area of the factory. In describing their problems, he illustrated the perspective that implementing the full system is a hard, ongoing process, but worth the effort:

We have gone through a number of ... attempts to solve the issue of high mix, low volume. And I'd say we're probably, in the last 18 months, two years, we're probably on our fourth version of trying something different. And what that is is really just a

continuous improvement process that says, okay, we got together as a team, we looked at some, we put something out there, how's this working? Try it. Gees, that didn't work. Well, like, what didn't work about it? Get back together again, look at something else, make an adjustment here, make an adjustment there, or in some cases revamp the whole thing.

Deviating from the normative labor process logic: Satisfactory framing and experience-based skepticism

A set of managers adapted the normative logic of the labor process based on a modified generic frame that “lean is a toolbox.” The most common perspective elaborating this frame was that the local situation is too complex and unique to embrace the full lean system, although some managers also expressed a perspective of skepticism toward the normative logic or drew on a traditional Fordist framing of practice. The case above where the plant manager at Second Tier said that machine uptime doesn't matter within the lean system illustrated the perspective that to get the lean system right, one must fully commit to the system on its own terms. In direct contrast, the plant manager at Tubefab – effectively an identical context, a subsystems assembler with around half the parts based on designs and half custom make-to-order – illustrates the generic frame that lean is a toolbox, fleshed out with a perspective that traditional metrics are still important, even if they conflict with lean. He explained that he explicitly knows he is deviating from the norm:

There's products we've run faster on a line than we have in a cell. But you know, that's not the norm but it's feasible. Generally we take a look at the volume and we say, 'Okay, can this family justify a cell full time and does it give us an advantage?'

He continued to explain that he was not going to integrate his large presses into the assembly cells:

To feed a cell that runs continuously – like our highest volume cell, it runs continuously at about 140 parts an hour – to make every component, there's one, two, three, four, five; there's five pressed components in there. So that's only 900 parts an hour that you need to make. It's not even that, it's only 700 parts an hour that you need to make. And generally straight-sides can run 1,200 to 2,000 parts an hour depending on the size of the part. *So you're only utilizing that press to half capacity* [my emphasis]. You know, so unless you had, say, one press feeding two cells somehow, it would be a challenge, you know.

This manager apparently had achieved significant performance improvements by using lean as a toolbox, and he did not want to pursue more radical change that would shake up the existing system too much. This position appears to be a combination of a particular framing of the situation, one inconsistent with the normative logic, strongly shaped by a moderate aspiration level. Whatever extent a moderate aspiration level played in the Tubefab case, the manager drew from the old dominant logic of Fordism – maximizing economies of scale on individual machines (and throughput in assembly) – resulting in a hybrid logic of lean-as-toolbox. This also appears to be the case on some US auto assembly plants, where managers continue to operate according to the old Fordist logic, maximizing throughput, leading them to ignore the core lean practice of allowing workers to stop the line to fix defects (Rothstein 2006).

In contrast to the frame of lean as a journey, a part of the frame of lean-as-toolbox for some managers was to view it as a one-off attempt at restructuring from a functional to product-focused layout. For instance, the president of Metalfab Plus stated that they “are about 90 percent complete on a full plant re-layout here.” He explained that there “was no concept of flow through this facility at all. So what we’ve attempted to do is move materials to point-of-use, and get a flow going through this facility.” Part of their definition of the situation is aspirational, deriving from their experience with achieving good-enough performance improvements by adopting lean as a toolbox. This was reinforced by their past experience, giving rise to a perspective of skepticism toward consultants and outside advice on their organization. Thus, the plant manager proudly indicated to me that they had not brought in consultants:

Now, on this reorganization you mentioned last time, you said you’re about 90 percent done. Who helped you with that?

I did that on my own. I mean all the strategy.

Okay. And no consultants brought in?

No consultants. We have not brought consultants into this business at all.

Okay. So you guys did your own value stream mapping and all that kind of stuff?

Yes, we did. Yes, we did, yep.

This type of skepticism of outsiders – both consultants and industrial customers – is common among small and mid-sized business managers. As an engineer in supplier development at a major industrial customer of this company told me, “You know, skepticism is a part of a business owner’s life. You have to be skeptical.” He went on, however, to elaborate the problem with not using value stream mapping as an ongoing tool: “You can’t use these tools once and expect ... that’s the whole Toyota mindset, continuous improvement. ... if you’re not constantly checking and remapping out your processes every year or whatever, how do you know you’re where you should be?”

The same engineer had a lot of experience with suppliers coming up with various reasons for not fully embracing lean as a system. Sometimes managers say “they basically don’t have the resources to work on that, and some of that’s legitimate, and I can understand that. But there also can be an element of passive resistance.” These are all variations on the most common perspective I found elaborating the generic frame that lean is a toolbox, namely, that the particular factory situation is too complex and unique to adopt the full lean system. The plant manager at Hydraulic Systems invoked precisely this argument, noting that it is hard for them to get the resources to work on perfecting the system, especially when they are “rocking and busy” trying to get the parts out the door:

It’s difficult for me at times: heard it, seen it. I’ve seen it work. I’ve seen it work at John Deere, up at Horicon. I mean, but when something stops, and getting the resources to fix that problem, ours is, we’re so, with the number of product, you know and then like operators moving around, it’s much more difficult. You know like when that person has

that particular problem there, we focus resources on that statement. It isn't, like you say, they're not interdependent, you know, because it's not a continuous flow.

Again, this is more of a bottom-up process in which they experienced significant performance improvements by adopting lean as a toolbox, and framed the situation as too complex and unique to adopt the full lean system, thus providing a rationale for deviating from the norm. Whether such a rationale is "legitimate" does not always have a clear answer because managers face a fragmented environment with multiple pressures.

The plant manager of LV Gaskets also understood lean as a toolbox, explicitly invoking the perspective that his particular factory is simply too complex to adopt the whole system:

You know one-piece flow, to a large extent here, is a dream. Primarily because we're in a situation where-oh, I'm going to guess-let's say I've got 8,000 pieces of tooling, okay? I've got presses that were purchased anywhere from 1945 to 2004. Standardization is not something that we're at all familiar with here.

Right. I guess I should have maybe said continuous flow rather than one-piece, because I know that's always kind of a dream in most shops.

It's also a lot better in the textbook than it is, you know, in reality. I'm sure you've done the continuous flow experiment they do with all of the lean manufacturing and things like that.

Lean 101, um-hmm.

It looks good and it works well, but you know, right in the middle of it you're not stopping because you've got to make 300 of something else.

But most factories are this complex, and I observed managers in factories of similar age, size and process (e.g. Performance Brakes) adopting the normative logic and pushing forward with more systematic lean transformation. My point is not to criticize individual managers for rationalizing a satisficing approach, but to illustrate the fundamentally cultural construction of managerial regimes in the real world.

A typology of lean production regimes

Based on the foregoing analysis, I now present a typology of lean regimes. The leanest regime, which I label high-involvement lean, is where management adopts both of the normative logics: a valorization logic of substantive participation with a labor process logic of lean-as-system. The other three regimes, discussed along with high-involvement lean in more detail below, result when management deviates from one or both of the normative logics. The argument in this section is twofold. First, the latter three types of lean regime are less able to generate systematic organizational learning, leading to improvements in efficiency and flexibility, because the high-involvement lean combination of worker-driven continuous improvement *with standardization* generates a context most conducive to organizational as opposed to individual learning (Adler and Cole 1993). Second, these three lean regimes are not transitional forms on the way to high-involvement lean but enduring forms: these managers have embraced a particular configuration based on cultural frames defining their situation as good enough and/or

complex and unique; and even the less-lean types have experienced significant performance improvements that satisfy their own internal management and their industrial customers. I present some performance metrics in this section.

The issue of performance metrics is extremely tricky, for two reasons. A first, methodological issue is that it was very hard for me to get any metrics from these managers. I asked for and was typically promised that quantitative performance metrics would be emailed or faxed to me after the interview, but this only happened in one case – something that is understandable because I was lucky to get any time from these busy managers who are preoccupied with running their businesses. A second, more substantive issue is that organizational performance is far from straightforward. Factories can get good quality and delivery without being particularly lean, for instance, by focusing on quality-at-the-source disciplines but holding inventory and not being very lean in terms of inventory or workflow or flexibility. Likewise, workers are generally interested in producing high levels of output and determined managers can realize cost reductions with various lean tools and traditional approaches (e.g. economies of scale). What I intend to do here, then, is provide some evidence that the satisficing regimes are experiencing significant performance improvements. I hope to make a case compelling enough that it can stimulate further research, both on validating the typology, including variable performance and durability of the regimes.

Based on the alternative logics of valorization and the labor process, Figure 2 presents a typology of managerial approaches to lean production. In the northwest quadrant is the most thorough type – *high-involvement lean* – referring to plants where managers adopted a valorization logic of substantive participation with a labor process

logic of lean-as-system. In high-involvement lean regimes the logics of substantive participation and lean-as-system are mutually reinforcing. Managers have implemented at least some work cells designed to approximate the idea of a highly interdependent system: production controlled by *kanban* and managed by workers; if there is a problem at one spot in the system, the entire cell shuts down, and front-line workers are empowered to engage in problem-solving and decision making.

[FIGURE 2 ABOUT HERE]

In practice, of course, there is variation in how far each factory has gone to implement high-involvement lean cells and processes throughout their factories, but the critical point, as argued above, is that management has not simply adopted the normative logics rhetorically, but embraced these logics because they are consistent with the managers' own understanding of the situation. Importantly, managers in these factories framed their situation as an ongoing lean journey and demonstrated a high level of ambition in overcoming the many problems they face with such a thoroughgoing restructuring of organizational routines and authority relations. These managers faced serious problems with resistance and reticence within the workforce (Vidal 2007b), but continued working on having front-line workers take on new responsibilities, using lean tools for ongoing continuous improvement.

As listed in Table 3 (discussed in detail in the following section), of the 22 lean factories I visited, I classify eight as high-involvement lean regimes. I only have manager's narrative descriptions of performance improvements and briefly provide a few

examples. Industrial Pumps has gone “from about 15 pumps a day to about 22 now. And with the same 35 guys working on our shop floor doing that same work, but going from 40 percent on-time to almost 90 percent.” Lead time (order to shipment) is another key lean metric. On this metric Industrial Pumps was “more of a two to four-week company, and now we’re more of a three to four-day company to ship a pump, and we can respond in a day without really throwing our company upside down.” At Designer Railings, the plant manager said they have gotten their lead times down from months to under five days for a key customer. He went on to explain that:

That's been in a phenomenally successful lean manufacturing operation. I have less successful ones, but still successful. I've got one that's coming up that has been very successful initially, and I think has the opportunity to double our productivity, if we execute on it, which we will. So we've made a lot of little islands of: this works better, this works better, this works better.

In the same cell “we’re down at six [defect] parts per million, which I think is a six sigma number that anybody would be really happy with over a 13-month period.”

Another key lean metric is inventory turns, which measures how quickly a company goes through its inventory (higher being better). At Custom Seats, the plant manager said that “We’ve taken inventory turns up every year. When I started here in '98, they were around six. They’re up to about 18 to 21 right now.” He went on to explain that “it’s gone up about three to five turns a year every year, since the cellularization effort.” On delivery for a major customer, he noted that “prior to the going into a cellular process back in the mid-90’s ... our best performance on delivery ... was 92%. ... And since

making those changes ... we've been, you know, 99.7 plus percent on-time delivery for them for years.”

Lean enough, the least systematic type located in the southeast quadrant of Figure 2, is the regime resulting where management adopts a logic of consultative participation combined with a logic of lean-as-toolbox. I characterize these plants as lean enough because with the changes they have made by restructuring according to these modified logics, they have experienced substantial performance improvements that have satisfied both their own management and their industrial customers. As already noted, each of the lean enough factories (along with all of the other types of lean regimes) adopted a set of basic practices: batch reduction, quick changeover, 5S and standardization, quality at the source and TPM. These factories did *not* implement continuous flow via *kanban* or use value stream mapping as a routine tool for *kaizen*. In lean-enough regimes, managers framed the situation in ways that allowed them to deviate from both of the normative logics, which were perceived as either unworkable or undesirable in their local organizational context.

In some cases, as shown above with Metalfab Plus, where management did not implement *kanban* control because of concerns that employees did not have enough discipline to manage such a system, a consultative logic played an important role in their adoption of a lean-as-toolbox logic. In this respect, the two alternative logics may strongly reinforce each other: it makes sense to adopt a consultative approach to employee involvement when implementing lean as a toolbox. That said, the lean-as-toolbox alternative does have a clear logic of its own, based in material practice: because managers can achieve substantial performance improvements by selectively adopting

lean tools, they are able to frame the situation as satisfactory. I cannot give a systematic analysis of the spotty performance data I received here, so I simply present some quotes from a couple lean-enough factories to demonstrate performance improvements across key metrics. At Metalfab Plus plant management stated that inventory “turns have been in the range of 10 to 12,” up from around five a few years ago. Their lean-enough changes such as product-focused layout, standardization and batch reduction are combined with holding extra inventory to quickly respond and running larger production runs than demanded by the market: “Once you get the setup right, you know, we’ll try to run based on forecasts, and willing to invest in the inventory rather than reset the press.” With this regime, they achieved significant performance improvements and were gaining new business:

We’ve recently landed Siemens Medical, for their oncology and ultrasound equipment, all their work. We’ve landed ... Federal Signal, to do a mechanism for some of their utility vehicles. We’ve landed work with a company called Zantrax that makes the control cabinets for the GE Windpower Systems.

At Tubefab, the plant manager said that “Delivery’s been pretty good. ... We’re running I think year-to-date we’re at 98, 98-something. ... if you looked at it a few years ago we would have struggled to be at 90.” He was among the few managers that did provide me with data from his factory, which confirmed what he told me. Again, they were heavily focused on maintaining business with key customers:

But for the most part we get, with John Deere for example, their highest quality rating, or level of quality expectation is about 400 parts per million on our class of part. We generally run on Deere about 200 parts per million. So we're well within their quality limits. On quality we are, on a parts per million basis, we are always at the high end of vendor expectations.

All of the other managers in lean enough regimes indicated they had seen significant performance improvements, were maintaining customers and getting new ones. Now, I do not mean to suggest, by any means, that these factories are not facing stiff competition. They are facing intense competition, in particular from overseas competitors located in low-wage regions. While facing serious competitive threats, they are focused on providing more services (just-in-time delivery, subassembly, quick prototyping, etc.) for their onshore customers and, more generally, trying to develop long-term relationships with their customers. Like Metalfab Plus and Tubefab, they claimed to be maintaining key customers and gaining new business.

Lean standardization refers to an approach where managers adopt a logic of lean-as-system combined with a logic of consultative participation. These plants focus on using lean tools to standardize processes throughout the plant, going beyond inventory and batch size reduction to engage more systematically in value stream mapping and other lean tools to realize some degree of continuous improvement in improving workflow and process standards. But because managers have adopted a logic of consultative employee involvement, they require highly dedicated management to drive continuous improvement. In high-involvement lean regimes, highly ambitious managers adopted the normative logics, which work to reinforce each other, whereas in lean

enough regimes, managers with more moderate ambition levels adopted the alternative logics, which, again, are mutually reinforcing. In the case of lean standardization regimes, it seems that managers are also highly ambitious in implementing lean as a system, but must maintain continuous improvement and an interdependent lean system in a management-driven fashion, relying heavily on supervisors and engineers.

The three lean standardization factories I observed did not implement extensive *kanban* systems or use value-stream mapping to the extent that the high-involvement lean factories did, suggesting that a systematic culture of substantive participation greatly facilitates the implementation of a highly interdependent and fragile lean system. Now, my analysis suggests that because it is based on a logic of lean-as-system, lean standardization is the nearest of the other types to high-involvement lean in terms of ability to generate organizational learning. Indeed, if management is determined enough, it may be able to maintain systematic continuous improvement. In the three lean standardization regimes I observed, management's adoption of a consultative logic of participation appeared to preclude the implementation of a lean system in a way that provided a basis for routinized continuous improvement. Sorting out the relative performance effects of high-involvement lean versus lean standardization (or the other types) will have to be left for future research.

Autonomous lean regimes, finally, occur where management adopts a logic of substantive participation that is at the high end of individual worker autonomy, which conflicts with lean demands for extensive standardization, and therefore results in the adoption of a logic of lean-as-toolbox. Two of the factories I observed had this type of regime. Hydraulic Systems has a unionized workforce of 90 production employees (plus

around 20 managers and white collar workers), consisting of highly skilled workers with a lot of craft pride. The workers took ownership in their work, doing whatever work needs to be done, and in large part because the union workforce is highly skilled and dedicated, the plant manager has allowed and encouraged a high level of individual and group autonomy. LV Gaskets is a much larger factory, with 350 employees, but as we have seen operates according to a corporate policy of participatory management.

Managers in both plants expressed skepticism toward the logic of lean-as-system because of their experience with high levels of individual autonomy being successful. By incorporating basic lean practices selectively with a high-autonomy approach to worker participation, they have achieved substantial performance improvements. Because they have not fully adopted the standardization of best practice across work cells and centers, I expect that they will not be able to engage in organizational learning to the extent that high-involvement lean and lean standardization regimes can, although they may perform better than lean enough regimes because their high level of worker autonomy will more likely generate individual learning.

[TABLE 3 ABOUT HERE]

Technological and structural factors

In order to head off possible objections to the cultural explanation, I now address some potential explanations rooted in the structural characteristics of these organizations. Table 3 presents the plants, ordered by type of lean, along with key characteristics. Within my qualitative sample, firm size and plant technology are all represented within each type of

lean, suggesting these characteristics provide little explanatory leverage on variations in lean regimes. While there is also wide variation within each regime regarding product type or technology, there does appear to be one pattern related to product complexity: factories where the primary products can be produced in a single operation (notably plastic thermoforming and injection molding) are clustered among the category of plants where lean is viewed more as a package of discrete practices or among the non-lean plants (a continuous-process painting operation). Plants with simple products that can be produced in a single step have less need for a comprehensive package of complementary lean practices, in particular, for lean workflow. Other than that, however, the range of production technologies are evenly represented in each of the polar types: high-involvement lean and lean enough. Ownership structure appears to have some relationship to leanness. Among the high-involvement lean plants all combinations of ownership type are represented. However, privately-held, independent plants appear to be overrepresented in the category of lean enough. This is consistent with a broader theme that emerges from my analysis: outside resources, such as that of a parent company or customer or consultant, play an important facilitating role in disseminating both knowledge and capability.

The most important aspects of the organizational environment seem to be location in the supply chain and the competitiveness of the particular product market, which, not coincidentally, are related to each other and to product complexity. Thus, the simplest products to make – “commodity products” – are also in the most competitive markets and at the top of the supply chain. For these products, such as plastic parts or screws, there is intense competition and little need to engage in collaborative relations with suppliers.

Thus, looking at Table 3, these are the same plants as those noted above for product simplicity – the thermoformers, injection molders and simple stamping factories that do little assembly – are among the least lean plants on my typology. Location in the supply chain, in turn, seems to affect supplier leanness primarily as a function of the coercive power of mega-prime contractors, who demand that their suppliers get lean, and in a similar mechanism to that of ownership type, may offer technical knowledge. Thus, many of the subsystems producers are overrepresented in the leanest plants in part because of the more intense pressure, and better knowledge, they receive from the prime contractors.

Ultimately, however, the sources of variation that appear to be most important have to do with managerial strategic orientation. Although far from having the capabilities of a high-involvement lean plant, in particular with regard to continuous improvement capability, the lean enough factories are profitable and generally growing. At the level of specific practices and routines, managers in these plants do not feel intense pressures to adopt world-class lean practices. If my argument is correct that the differences are primarily due to cultural orientations of management, that the competitive environment for component suppliers is permissive with regard to internal performance, and that lean enough regimes are producing output that is satisfactory for both internal plant management *and* for their industrial customers, then lean enough and the other intermediate types are likely to be relatively stable organizational regimes.

Conclusion

I have sought to contribute to institutional theory by showing how a competitive field may become institutionalized such that it allows a relatively high level of discretion in

operational strategy. Lean production has had become institutionalized in the US manufacturing field through the establishment of two dominant institutional logics, which permeate managerial discourse and are broadly adopted by leading organizations, providing cultural frames that orient and guide managerial action. A dominant logic of the postfordist labor process specifies a detailed, complementary package of manufacturing practices for process control, standardization and continuous improvement. Closely related is a dominant logic of valorization, referring to the managerial problem of extracting effort from workers. Because the problem of valorization under postfordism becomes a question of employee involvement – concerning the locus of control over physical and intellectual output – it is understood by many managers to constitute a distinct issue, often considered apart from, and sometimes shaping, managerial understanding of the broader set of organizational practices, of the labor process as such. In the US field the dominant logic of valorization is one of substantive employee involvement. However, the manufacturing field is institutionalized such that the logics are effectively normative prescriptions. Because industrial customers generally are concerned only with supplier performance regarding output – not internal efficiency as such – there are few enforcement mechanisms, hence room for managerial deviation from the normative logics.

Although I was not able to systematically get quantitative data on performance, my qualitative analysis of variation in regimes of lean production strongly suggests that the normative model of lean is the most efficient and flexible form, and that the other three regimes are less efficient yet stable (I have provided an in-depth qualitative analysis of technical inefficiency in these factories elsewhere (Vidal 2009)). But my argument is

not that the less-lean regimes are the result of irrational behavior driven by cultural values distinct from technical concerns, as if there is a clear distinction between rational maximizing behavior and nonrational, cultural behavior. The former exists only the Economics textbooks. In reality, as March and Simon (1993) argued, optimizing behavior is impossible due to information processing limitations, and, as Lounsbury (2007) argued, even technical concerns with organizational efficiency are embedded in broader institutional beliefs.

I showed how the normative institutional logics helped managers develop a relatively coherent definition of the situation. To examine how actors invoked, and sometimes altered, the institutional logics through their material instantiation in concrete practice, I distinguished between the generic cultural frames of managers and the more specific perspectives through which generic frames were fleshed out to give meaning to a concrete context. Managers brought background knowledge and understanding based on past and present experience as they restructured their organizations in light of the normative institutional logics. Where the normative logics were consistent with their existing understanding, managers adopted the generic frames associated them and implemented them as such. Other managers invoked a set of perspectives, based in past and present experience, but also shaped by moderate aspiration levels, that elaborated a generic frame which *rationalized* modification of the normative logic.

Even those deviating from the normative logic understood their approach to be rational responses to complex, real-world contexts. While my data suggest that managers adopting the normative logics as such had high aspiration levels, and those deviating from them more moderate aspiration levels, I do not intend to invoke ambition as a

critique of individual managers, as if they are not trying hard enough. Rather, I mean to argue that aspiration levels vary across the population, and that managers – some good, some poor – face extremely complex and uncertain situations, and can achieve significant performance improvements by modifying the normative logics. While some managers adopt lean-enough transformations, framing the situation as good enough, my findings suggest that if certain other managers, interpreting the context according to distinct cultural frameworks, were to take over these factories they would make them systematically leaner, hence more efficient and flexible. My point is not to fetishize technical efficiency, but to provide a cultural critique of rational choice theory and the common association of market competition with efficiency.

The analysis suggests three areas for future research. First, systematic quantitative analysis is required to test the working hypotheses concerning the performance effects of different forms of lean, and longitudinal analysis to examine the durability of lean-enough and other less-lean regimes. Additionally, the typology of lean practices should be expanded to include intensified forms of lean. Second, a key task is to focus systematically on the social-psychological sources of variation in managerial reaction to the normative logics. In particular, the complex interaction between cultural framing and moderate aspiration levels requires further examination, including whether ambition shapes the way a situation is framed as much as cognitive schemas or cultural frames may drive behavior independently of ambition levels. Finally, institutional scholars and economic sociologists should take up the charge to examine the extent to which market contexts systematically permit and generate technical inefficiency. In particular, more research is needed on specific forms of institutionalization in competitive fields and on

the cultural and political sources of technical inefficiency in organizations. A key question is how managers react to valorization pressures (extracting surplus labor for exchange value) in ways that generate distortions in the broader labor process (cooperating to produce use values).

¹ I have shown elsewhere (Vidal 2007a; Vidal 2007b) that none of the 59 workers I interviewed in lean production regimes registered any concern with physical work intensification, although many had serious problems with various aspects of lean, including increased stress due to new responsibilities for problem-solving and decision-making. While these articles emphasized the fundamental importance of workforce reactions in shaping workplace outcomes, my focus in this paper is restricted to a cultural analysis of managerial strategies.

² Search conducted on December 27, 2011.

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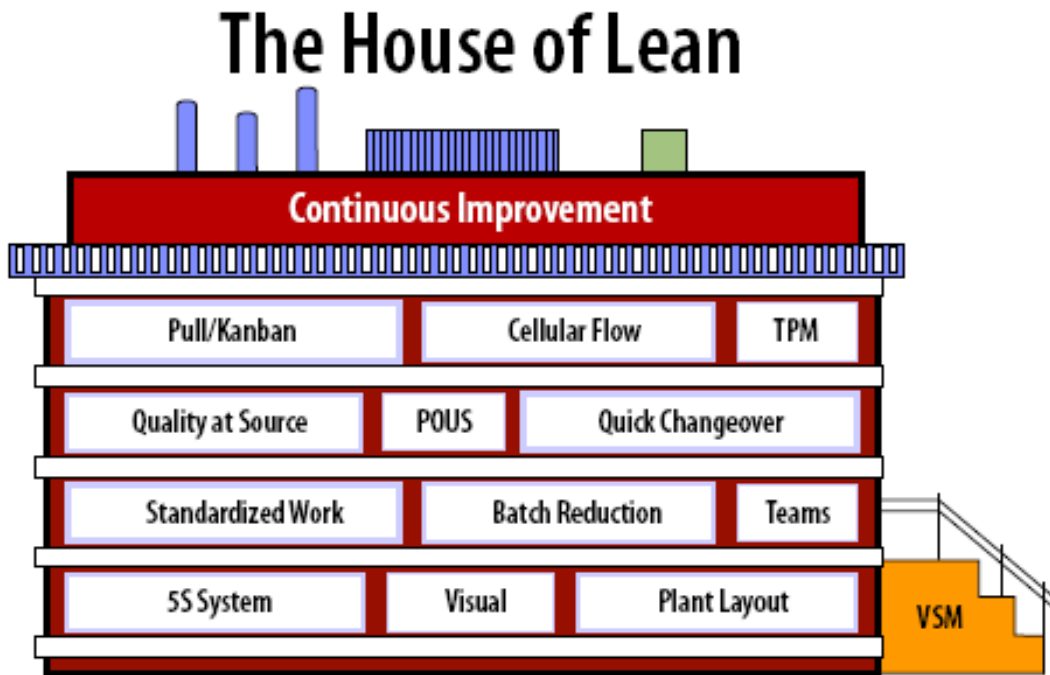


Figure 1. The normative logic of the lean labor process.

Source: Wisconsin Manufacturing Extension Partnership, *Manufacturing Matters!* Newsletter, 2005.

<u>LOGIC OF VALORIZATION</u>	<u>LOGIC OF LABOR PROCESS</u>	
	LEAN-AS-SYSTEM	LEAN-AS-TOOLBOX
SUBSTANTIVE EMPLOYEE INVOLVEMENT	High-involvement lean	Autonomous lean
CONSULTATIVE EMPLOYEE INVOLVEMENT	Lean standardization	Lean enough

Figure 2. A typology of approaches to lean production.

Table 1. Institutional sources of operational strategy.

Plants	Industrial customer	Parent company	Tech college and/or MEP	Industry assoc.	Outside hire of lean expert	Consultant	Rational information search
1. Custom Seats	X					X	
2. Designer Railings	X		X	X			
3. Industrial Pumps			X				X
4. Inspired Castings	X		X				X
5. Mini Metalfab	X		X				
6. Mini OE		X			X	X	
7. Performance Brakes	X					X	
8. Second Tier Specialist		X			X		
9. Custom Blinds		X				X	
10. Deep Stampings	X	X					
11. Lost-Foam Castings	X	X		X			
12. Hydraulic Systems	X		X				
13. LV Gaskets	X	X	X				
14. Complex Iron Castings	X		X				
15. Major Castings	X	X	X				
16. Metalfab Plus	X		X		X		
17. Plastic Containers				X			X
18. Precision Metalfab	X		X				X
19. Spindles & Machining			X				
20. Tiny Plastic Parts			X				X
21. Tubefab	X					X	
22. Zinc Castings	X					X	

An X indicates a source that was highlighted by managers in my interviews; lack of an X does not necessarily mean that a plant did not also use or get pressure from a given source.

Table 2. Institutionalization of lean production in the US manufacturing field.

Level	Characteristics
Normative logic of lean production	Adopted by: <ul style="list-style-type: none"> • Toyota, Chrysler, Ford, GM, Volvo • Case New Holland, Caterpillar, John Deere • Harley-Davidson, Oshkosh Truck • Dell, Hewlett Packard, IBM, Samsung • Boeing, Lockheed Martin, General Electric • Numerous others
	Endorsed by: <ul style="list-style-type: none"> • National Association of Manufacturers • Society of Manufacturing Engineers • National Association for Job Shops and Small Manufacturers • Institute of Industrial Engineers • Association for Manufacturing Excellence
	Technical assistance provide by: <ul style="list-style-type: none"> • Industrial customers • Cottage industry of private sector lean consultants • 60 local centers of the Manufacturing Extension Partnership
Inter-organizational relations: Permissive competitive structure	Embedded customer-supplier relations: allow institutional space for variation in supplier performance. Customer concern with output, not internal performance: Customers demand that suppliers get lean, but often give mixed signals concerning internal performance versus output (e.g. holding inventory internally to do just-in-time subcontracting).

Table 3. Plant characteristics.

PLANTS	PLANT CHARACTERISTICS					DIMENSIONS OF LEAN	
	MAIN PRODUCTS	PROCESSES	OWNERSHIP	EMPL.	UNION	LOGIC OF VALORIZATION	LOGIC OF LABOR PROCESS
<u>HIGH-INVOLVEMENT LEAN</u>							
1. Custom Seats	Leather and vinyl seats	Sewing, upholstery, Assembly	Public, branch plant	220	Yes	Substantive participation	Lean-as-system
2. Designer Railings	Handrail systems and parts	Machining, stamping, assembly	Private, branch	140	No	Substantive participation	Lean-as-system
3. Industrial Pumps	Industrial pumps	Machining, assembly	German parent	82	No	Substantive participation	Lean-as-system
4. Inspired Castings	Steel castings	Investment casting	Private, branch plant	650	No	Substantive participation	Lean-as-system
5. Mini Metalfab	Metal fabrications	Fabrication, assembly	Private, independent	27	No	Substantive participation	Lean-as-system
6. Mini OE	Wire wheels/Brushes	Assembly	German parent	105	Yes	Substantive participation	Lean-as-system
7. Performance Brakes	Hydraulic disc brakes	Machining, assembly	Private, branch plant	350	Yes	Substantive participation	Lean-as-system
8. Second Tier Specialist	Industrial cylinders	Machining, assembly	Public, branch plant	100	Yes	Substantive participation	Lean-as-system
<u>LEAN STANDARDIZATION</u>							
1. Custom Blinds	Blinds, components	Injection molding, extrusion, stamping, assembly	Private, branch	1000	No	Consultative participation	Lean-as-system
2. Deep Stampings	Deep draw stampings	Stamping, secondary ops, assembly	Public, branch plant	300	No	Consultative participation	Lean-as-system
3. Lost-Foam Castings	Aluminum castings	Die and investment casting	Public, branch plant	180	Yes	Consultative participation	Lean-as-system
<u>AUTONOMOUS LEAN</u>							
1. Hydraulic Systems	Hydraulic systems	Machining, fabrication, assembly	Private, branch plant	110	Yes	Substantive participation	Lean-as-toolbox

2. LV Gaskets	Engine gaskets	Metal forming, assembly	Public, branch plant	350	No	Substantive participation	Lean-as-toolbox
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LEAN ENOUGH

1. Complex Iron Castings	Iron castings	Die casting operations	Private, independent	120	Yes	Consultative participation	Lean-as-toolbox
2. Major Castings	Aluminum castings	Die casting operations	Public, branch plant	650	No	Consultative participation	Lean-as-toolbox
3. Metalfab Plus	Metal fabrications	Fabrication, assembly	ESOP, independent	450	No	Consultative participation	Lean-as-toolbox
4. Plastic Containers	Plastic containers	Thermoforming	Private, independent	220	No	Consultative participation	Lean-as-toolbox
5. Precision Metalfab	Metal fabrications	Fabrication, assembly	Private, independent	135	No	Consultative participation	Lean-as-toolbox
6. Spindles & Machining	Spindles, hubs	Machining, assembly	Private, independent	30	No	Consultative participation	Lean-as-toolbox
7. Tiny Plastic Parts	Plastic parts	Injection Molding	Private, branch plant	400	No	Consultative participation	Lean-as-toolbox
8. Tubefab	Mufflers, air filters	Stamping, assembly	Public, branch plant	150	No	Consultative participation	Lean-as-toolbox
9. Zinc Castings	Zinc castings	Die casting	Private, branch plant	32	Yes	Consultative participation	Lean-as-toolbox

LARGELY TRADITIONAL

1. Traditional Stampings	Stampings, fabrications	Stamping, fabrication, assembly	Private, independent	100	No	Traditional Taylorism	Beginning lean-as-toolbox
2. Powder Coaters	Painting	Painting	Private, independent	60	No	Traditional Taylorism	Continuous-process technology; lean mostly not applicable

Factories coded as using the lean-as-toolbox logic adopted batch reduction, quick changeover, 5S and standardization, quality at the source and TPM, point-of-use storage, and visual management, but did not adopt *kanban*-based production control, implement highly-interdependent cells or use value stream mapping to improve workflow on a regular, ongoing basis.