



“Summary of article by Christian Berggren: Toward Postlean Production”
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For much of the 20th century manufacturing has been organized around mass production, a model often termed “Taylorist” after Frederick W. Taylor, the founder of scientific management, or “Fordist”, after Henry Ford who built the first mass production factory. Taylor saw work, not as a matter of skill and craftsmanship, but as a series of discrete motions which could be analyzed to generate the most efficient, most easily replicated pattern for accomplishing any task. Ford combined such narrowly specified jobs with a highly engineered environment of mechanical conveyances, specialized equipment for repetitive production of standardized parts, and orderly sequencing of the flow of work. The Fordist factory became one of the emblematic institutions of the mid-century industrial economy and one of the engines of post World War II prosperity.

Although factory workers participated in the general rise in the material standard of living, their jobs were often tedious, physically exhausting and devoid of interest, responsibility or authority. As a whole, the system was slow to adjust to economic cycles or changing social or consumer needs. Since the 1970s there has been much rethinking of the Fordist system, and once again, leading candidates for new manufacturing models emerged in the auto industry.

THE VOLVO TRAJECTORY

In Japan concern for quality and efficiency motivated the development of “lean production”, a model that currently dominates discussion of new work systems. But it is not the only alternative. In Sweden the motivation for change came from a need to reduce the tediousness of factory work and led to experimentation with socio-technical models stressing compatibility between technology, organization and the human worker.

Unlike many industrialized countries, during the late 1970s and 1980s Sweden had very low unemployment, and manufacturers faced powerful unions and a shortage of labor. Turnover in manufacturing was high, especially among young people. This placed a particular burden on Swedish automakers because they specialized in high-end export markets that demanded well-made, customized products. Quality, prompt delivery and flexibility were key to the industry’s competitiveness, and these factors required a stable, highly competent work force.

During the 1970s and 1980s, Volvo and other motor vehicle producers in Sweden introduced several innovations when they opened new plants or diversified product lines. They experimented with work teams and lean production, but serious personnel problems remained.

Volvo, faced with “massive discontent with working conditions on the assembly line”[235], made serious attempts at reform, but found changes difficult to implement in older facilities with entrenched management cultures.

Newer Volvo plants were better able to undertake experiments in human-centered socio-technical design. The Kalmar plant was built in the mid-1970s around ergonomic improvements, team-based production, and technological flexibility that allowed components to be moved easily from one team to the next in the production sequence. Though productivity gains were not quickly achieved, by the mid-1980s Kalmar was Volvo’s best operation. However, improvements in working conditions were not as dramatic as expected and the coordination of separately produced components required expensive, complex systems for in-plant transportation and storage. A new Volvo truck plant opened in 1981 with a compromise between traditional and more integrated processes giving work groups considerable autonomy. By the late 1980s the product design became more complex, pushing the limits of the system. Management tightened supervision, but at the same time set up a dock assembly shop (in which a team of workers assembled a whole truck) for the most complicated vehicles.

In the late 1980s Volvo opened the Uddevalla plant with the most radical production design yet: fifty work teams, each producing a whole car. Before the plant worked out its bugs, a national recession occurred that made workplace reform a luxury and led to criticism of Uddevalla for poor productivity. Though the criticism sparked performance gains, the company’s sales plummeted, pitting Volvo plants against each other for dwindling orders. Management was ambiguous about the “noble experiment” closing the Uddevalla plant in 1993 and Kalmar in 1994. Uddevalla was reopened in 1995, as part of a joint venture between Volvo and a British engineering firm to produce niche vehicles, coupes, and cabriolets.

PERFORMANCE: PRODUCTIVITY, QUALITY, AND WORK CONDITIONS

After working out initial problems, the productivity levels of the Kalmar and Uddevalla facilities were comparable to most European plants, and one or the other outranked many other factories in quality, customer satisfaction, or the ability to respond to design changes and variable market demand. One 1993 model built at Kalmar matched Toyota’s Lexus for low rates of customer complaints. Uddevalla developed direct relationships with distributors and by 1992 was producing cars on order for European delivery with a four week turnaround period.

However, other problems hindered these plants from achieving the same performance levels as the most productive Japanese plants. Volvo products were more complicated and difficult to manufacture than Japanese cars. Some turnover and absenteeism persisted. Volvo generally lacked the tight quality control over its suppliers that is characteristic of advanced Japanese manufacturers. Furthermore, because they performed final assembly only, Kalmar and Uddevalla were the easiest facilities to lop off when the recession hit and sales fell.

Critics claimed that long-cycle production (working on an entire product as a team, rather than repeating fragmented jobs in an assembly line fashion) is a form of “craft nostalgia” that extends the assembly process, without significantly enriching the work experience. However, surveys of workers at several Swedish bus, truck, and auto plants indicate that work content is important for

workers and that “[t]he further from traditional line assembly a plant moves, the better the outcomes in terms of variation, prospects for personal growth, the taking of responsibility, and the opportunity to use one’s skills.”[242] Reports of physical strain and fatigue after work were lowest where work cycles were longest, and workers expressed a desire to work on complete vehicles to relieve monotony. More than just adding tasks, holistic long-cycle assembly increases understanding of the interrelated parts of the vehicle, offers a sense of purpose, and increases opportunities to cooperate, interact, and vary the work pace and position.

This approach contrasts with Japanese lean production which retains the assembly line structure with an intensification of work effort and precise specification of pace and physical movement. Although problem-solving is encouraged, it is not related to the product or process as a whole, but to the continuous improvement (“*kaizen*ing”) of fragmented suboperations.

ORGANIZATIONAL CHOICE

Organizational Choice, by E. Trist, *et al.* (1963), claimed that work organization is independent of technology and the work process; however case studies with a longer time frame, show otherwise. Japanese competitiveness and lean production rely on a number of components besides the way work is organized. Equipment and parts suppliers, product design, production, distribution, and customer service are linked in collaborations that reduce development times for new models and set-up times for customized products, thus enhancing quality control over both in-house and vendor supplied components. However, Japanese working conditions involve intense machine pacing, surveillance of workers, rigid production quotas, mandatory overtime on short notice, and ergonomic deficiencies. While lean production has made important contributions, it is hardly a global “best practice.” Japanese auto plants in Japan are gaining a reputation as poor places to work and dissatisfaction is high. In response to this perception, a new Toyota plant opened in 1991 with worker-friendly modifications.

TOWARD POSTLEAN PRODUCTION

Driven by a demanding workforce, Swedish auto makers demonstrated that an integrated, holistic, dignified approach to production is technically feasible, socially desirable, and compatible with market demands. They made significant ergonomic adaptations to human differences, particularly to the needs of women workers who make up forty percent of the industry workforce. Other human needs, such as family obligations, were recognized and accommodated, while unions played an important and respected role in planning and work organization.

Some synthesis between the Japanese and Swedish systems is possible. Collaboration between design and manufacturing would enhance the intellectual content of integrated work processes. Some discipline, for example, in quality control procedures, could improve the Swedish model without excessive standardization. Where the two systems are incompatible, firms need to choose between measuring efficiency solely by worker hours or by consideration of human needs. This can assist unions to develop a critical approach to lean production and governments to support labor market conditions that foster human-centered work systems.