

Established in 1983, JJS Electronics has a proven track record of providing reliable and cost effective manufacturing services to both International OEMs and SMEs. Having ISO 9001:2008 accreditation and working to IPC 610, JJS offers a broad range of PCBA, cable, system and also non-electronics based precision mechanical assembly services from their two European plants. Lean Manufacturing philosophies have been a cornerstone of the business' operations strategy, including their own brand of "Lean Lines."

Since the middle of the decade, there's been much discussion about Lean Manufacturing, though somewhat less about how to implement it. Nonetheless, it's been accurately credited with the salvation of a lot of electronics companies after the internet bubble burst in 2001, and in spite of what some American politicians are preaching about the current climate, the adage "Never waste a good crisis" still has fresh relevance. Tough times can be the best times to implement lean programs. Not surprising either given the fact that the originators and many of the model practitioners began it all with their backs to the wall during deep crises.

In the Autumn of 1920 Henry Ford found himself weeks away from bankruptcy as the post war boom abruptly ended with billions removed from the economy by an inflation fearing federal government. (90 years later a new car is still an easy personal budget stretching decision to make, as we've certainly just witnessed.) drowning in almost \$90 million of inventory and \$60 million in debt, a program that had been successful during the recently ended war that reduced inventory and freed up plant space by scheduling deliveries and shipments exactly when needed was aggressively rammed into place. Just-in-time was indeed just in time and in six months Ford was cash positive and using 4% less labor per vehicle.

After building trucks to support Japan's failed military exploits, following World War II Toyota was a tiny manufacturer of third-rate cars in a meaningless market. They've since overtaken General Motors for the position of largest vehicle manufacturer in the world. As well as studying Ford's successes, inventing Kanban while visiting US supermarkets and developing model setup reduction processes, a turning point in their own dire precipice presented itself during the Japanese financial crisis in 1949. A related and intense labor strike had the company all but bankrupt. A paradigm shift about the role of people in Toyota's operations transpired and some argue that this was more important even than the many process and technical innovations that all became part of the legendary Toyota Production System and Lean Manufacturing.

Implementing lean operations requires large paradigm shifts. Change is almost always resisted, and in manufacturing even more so the case (and for arguably good reasons of consistency and reliability, for instance). And, previous successes make the existing model that much more difficult to leave behind. So, when times are more challenging an organization is more likely to be open to change. In addition to change being easier and faster to implement in a crisis, lean programs tend to be self financing and cash flow benefits can come very quickly.

Lean implementations take on different forms. Some companies stumble through by trial and error while others approach it as a continuous series of Kaizen events. Another method

stresses a series of prescriptive phases including Continuous flow, Standardized work, Pull systems and Continuous improvement. A list of two dozen or more textbook Lean Manufacturing terms can be readily made but there are no universal remedies and it cannot be approached as a series of pre-defined phases that will roll through factory like a series of thunderstorms. And it need be kept in mind that Toyota was not out to create a manufacturing model...they were trying to solve their own particular problems. In other words, implementation calls for a strategy developed in context.

The JJS commitment to Lean Manufacturing was not born out of economic crisis but nonetheless exhibited many fundamental shifts in thinking characteristic of lean implementations. Based in Lutterworth, England and Chomutov in the Czech Republic the JJS Electronics business is focused on prototype through to medium volume assembly work of a diverse nature. JJS has significant experience in supporting the industrial control, scientific instrumentation, test & measurement, communications, aerospace, medical and mass transportation industry sectors.

The Czech facility was opened in 2005, and lean philosophies characterized it from the outset. The strategy employed began with examination of which categories of the many lean tools and techniques made sense for their business, and in which sequence the elements selected as important be implemented.

Operations Director Derek Williams explains. "Our view is that people are the key to any business success, and so it was from that cornerstone that everything in our plan was progressed. Language was recognized as an immediate challenge and so that too became a specific plan component."

"And to this day," Derek continued, "The significance of our recruiting methodology and the roles that JJS personnel play remains key to executing our particular lean lines methodology and in turn our overall business model."

JJS possesses a special proficiency in non-electronics based precision mechanical, assembly techniques, the the company refers to as 'mechatronics'. Added to PCB, cable, electrical and system assembly this activity gives JJS a near unique position in the market place, offering extensively integrated manufacturing services beyond basic PCBA.

Many complex mechanical assemblies demand similarly high levels of skill, precision, accuracy and consistency to their electronic counterparts. The JJS staff are highly skilled in this kind of work, including testing of mechanical and pneumatic assemblies.

But contrary to traditional interpretation, that high skill level is the direct result of a process that includes the continuous breakdown of all build procedures with the objective to "de-skill" each to the greatest possible degree. This contributes dramatically to both scalability and the consistency with which complex electro-mechanical systems can be produced. In the context of

line balancing (one of the cornerstones of lean manufacturing at JJS) this includes time trials and the analysis of work content in present each process step.

Also fundamental to lean the JJS way is a commitment that everyone can (and does) lead, analyze and contribute to the creation of assembly procedures and to the process of improvement. It's a principle by which they train as well as operate. NPI and other short run manufacturing projects demand a special balance of set-up and production skills to be effectively and efficiently produced. Short runs, for example, are not conducive to extensive assembly documentation which cannot be relied upon and must be minimized. The employee prospect testing and training process at JJS utilizes concepts familiar to the "instructions" employed by complex Lego® assemblies. Step by step analysis prompted by pictorial, word-free guidance provide ideal models for skill sets that are essential to a flexible and at the same time highly efficient assembly operation where mixed model lines including A and B versions of a common core product are manufactured together.

Unlike the Ford and Toyota experiences that have become the key reference points for all things lean today the JJS business includes an added dimension of complexity that comes with contract manufacturing. That namely is taking over complete manufacturing responsibility for someone else's product and with it whatever manufacturing documentation may or may not exist.

"Rewriting our customers' documentation, including extensive BoM analysis is an essential part of our ability to process map and balance workflow, explained Derek. "And in the context of our approach, it's not unusual for a 3 or four page procedure that only a test engineer can understand, becomes a working document that personnel at any level of the organisation can comprehend."

Complementing the system assembly activity, JJS has an extensive system test and diagnostics capability encompassing low power TTL through to high voltage heavy currents, from handheld computers to large industrial laser power supplies. A comprehensive test strategy is another core element of the lean the JJS way, and it's highly integrated and closed loop back into the front end of every manufacturing process. Definitely not about repair but instead about better understanding the process and preventing fault reoccurrences.

Test engineering does not fit into lean principles...at least not traditional test engineering. Once again the JJS view introduces a paradigm shift as even this process, semi-mystical in many legacy operations, is dissected and de-skilled. This includes fixturing that plays a significant role in departing from traditionally engineering intensive test processes.

Today....

JJS provides a complete end-to-end service taking complete responsibility for the management of the inbound material supply chain, through manufacturing and test of the products, all the

way to the delivery to customers' customers.

From both facilities in the UK and the Czech Republic, international direct order fulfillment and distribution capabilities enable customers to outsource logistics and after-sales responsibility to JJS.

JJS customers using their "direct-ship" service don't touch the product before it is delivered to their end users enabling them to reduce product time-to-market, improve inventory efficiency, reduce their material storage footprint and minimize logistics/distribution costs.

In other words....Outsourced Lean...