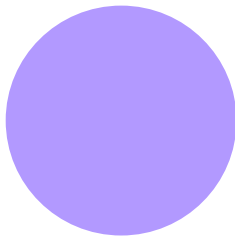
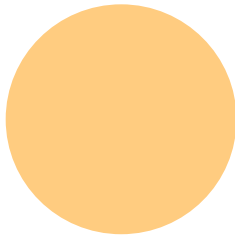
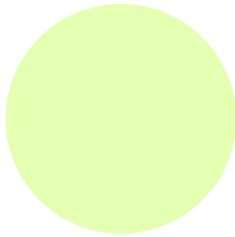


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LEAN THOUGHTS

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Assembly line put the world on wheels

By: **BILL VANCE** for the *Kitchener Waterloo Record*, May 19, 2006

The basic method of building cars hasn't changed much over the last 93 years: move the chassis slowly along an assembly line while workers attach components as it passes. Toyota's lean production has refined and improved the method, but the process is the same.

At the end of the line, a finished vehicle emerges. It is still one of the miracles of our industrial age. Henry Ford I is often credited with the invention of the auto assembly line, but according to his confidant and close associate Charles Sorensen, this was not quite the case. Manufacturing chief "Cast-Iron Charlie" Sorensen, a Ford Motor Co. employee from 1905 to 1944, claimed it was his idea.

Henry, according to Sorensen, was an interested onlooker who didn't discourage Sorensen and his assistant, a young foreman named Charles Lewis, when they experimented with the idea. The assembly line coincided with a rising interest in what was called "scientific management," as espoused by time-and-motion guru Frederick Taylor in his 1911 book, *The Principles of Scientific Management*. It promised higher production efficiency by breaking jobs down into small, repetitive units of work requiring little training. Sorensen, however, denied that Taylor had any direct influence on the Ford conversion.

In his book, *My Forty Years With Ford*, Sorensen writes: "It was then (when he and Lewis were experimenting with a simple form of what is now called just-in-time inventory control) that the idea occurred to me that assembly would be easier, simpler and faster if we moved the chassis along, beginning at one end of the plant with a frame and adding the axles and the wheels; then moving it past the stockroom, instead of moving the stockroom to the chassis."

To test the idea, in 1908 Sorensen and his assistant worked every Sunday for a month in a secret room distributing the car components in a line on the floor. They started with the frame, wheels and running gear. When test day came they mounted the frame on skids. Two assistants pulled it along with a towrope until they had the axles and wheels fitted, then rolled it along while Sorensen and Lewis moved with it and added parts.

". . . Lewis and I and a couple of helpers put together the first car, I'm sure, that was ever built on an assembly line," wrote Sorensen.

When shown the crude assembly line, Henry was, according to Sorensen, skeptical but encouraging. Ford metallurgist, Harold Wills, who later founded carmaker Wills-St. Clair, was downright hostile. He said building cars that way would ruin the company.

Although conceived in 1908, its implementation was delayed for five years. Ford was producing the last of its Model N cars in 1908 and a new assembly method would have upset its production and the changeover to the Model T. The Model T had been announced in the spring of 1908 and shown in October. According to Sorensen, production began in December.

The Model T was Henry's dream car, and orders soon poured in. Because its production was the first priority, the assembly line idea languished.

Henry had another serious preoccupation: the Selden patent registered by George Selden, a Rochester, N.Y., patent lawyer, for an engine-powered carriage. Although Selden had not built a vehicle, his patent was widely honoured and most car companies paid Selden royalties.

But stubborn Henry Ford went on building cars, not paying royalties, and fighting the patent in court. Finally, in January 1911, the Circuit Court of Appeals gave Selden a hollow victory; the patent was upheld, but did not apply to cars built by Ford or other manufacturers. It lifted the yoke from the industry, and was one of Henry Ford's single greatest achievements. His stature as a folk hero soared even higher.

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It was quickly apparent that the Model T's popularity required a new factory, and construction began almost immediately on 60 acres in Highland Park, Mich.

By 1910 Model T production was moved into one-quarter of the completed plant, and the new location gave Sorensen the opportunity to install his assembly line.

By August 1913, Sorensen recounts, ". . . All the links in the chain of moving assembly lines were complete except the last and most spectacular one -- the one we had first experimented with one Sunday just five years before." This time the frame was moved mechanically. Some parts took longer to attach, but the workload was gradually balanced.

The method was a spectacular success. It reduced assembly time for a Model T from 12 1/2 hours in August 1913, to 1 1/2 hours a year later. The moving assembly line soon spread through the industry.

Ford's 1912 production was 170,000 cars, but by 1914 it was 308,000, and by 1916 735,000. This allowed Henry to keep reducing the Model T's price. When production ceased in 1927, more than 15 million had been built. The assembly line showed the way to real mass production, and was the critical factor in putting North America, and much of the rest of the world, on wheels.

Reflections on Automotive History by Bill Vance, Volumes I, II and III, is available from bookstores, Eramosa Valley Publishing, Box 370, Rockwood, Ont., N0B 2K0, or www.billvanceautohistory.ca. Soft cover, \$29.50; hard cover, \$41 (includes tax and shipping).

Lean Manufacturing or Lean Enterprise?

Does Lean apply only to manufacturing or is it applicable to other parts of our business? This is a question that is being asked with greater frequency... a question that you may be asking yourself. The short answer is no, in fact Lean applies to all areas of business. Why then does the perception exist that Lean only applies to the shop floor? A more detailed answer I believe, can be uncovered if we take a look at some of the history behind the term "Lean" as well as traditional continuous improvement activities.

Upon some reflection, I have come up with two theories. The first theory is this perception may be a result of terminology that the Lean community uses. Phrases like Lean Manufacturing, Lean Production and certainly the roots of what we call Lean today, the Toyota Production System, includes the words "manufacturing" and "production". So the question begs asking, have we (as Lean Practitioners) perpetuated the stereotype by simply using these industry terms?

To test this theory, I decided to run a search on Amazon.com. Although not scientific, I wanted to see if there was some evidence to support this theory.

I conducted the search in the book section of the website under Business and Investing. The results were actually quite staggering. I first searched the word Lean that returned 157 hits. I then searched the term Lean Manufacturing that resulted in 43 549 hits! Wow, a 1:277 ratio! What does this information really tell us? Well simply that there is far more written about Lean Manufacturing than just Lean. While this is by no means conclusive, it certainly does support the theory and could possibly contribute to the perception that Lean does in fact apply only to manufacturing. After all, the authors that create the material we read associate "Lean" with "manufacturing", so why shouldn't we all?

The second theory in how we perceive the application of Lean lies in the way manufacturing firms have traditionally engaged in continuous improvement activities. Those who have spent any part of their career in manufacturing certainly can relate to the statement, "When we seek to improve we seek the shop floor."

Not that the shop floor isn't a viable option for improvement initiatives, it is, and should be a consideration of any well thought out plan. But for those of us that have had exposure to Value Stream Mapping, we know that the shop floor accounts for only a portion of the total value stream lead-time, and usually a small portion.

Source: Chad Metcalf, Solutions Plus, www.solutionplus.com



Consortium Event Schedule

Tour Workshop Conference



January	February	March	April	May	June
<p>T</p> <p>Wednesday 25 <u>Eaton Electrical</u>, contact Joe Fisher, JoeRFisher@eaton.com</p>	<p>T</p> <p>Wednesday 15, <u>CFN Precision</u>, contact Barry Wood, bwood@cfn-inc.com</p> <p>W</p> <p>Date & location TBA Your own "STEP Diagnostic" to create Vision, Mission and Direction Contact Richard Kunst Richard.kunst@la-z-boy.com</p>	<p>T</p> <p>Wednesday 22, <u>Nestle Waters</u>, contact Mariela Castano mcastano@perriergroup.com</p>	<p>T</p> <p>Wednesday 19, <u>CTS Corp.</u>, contact Bob Garces, Bob.Garces@ac.ctscorp.com</p> <p>Consortium Shakeshowcase Saturday 29 <u>Kraft Oakville</u>. Contact Cindy Grolleman cindy.grolleman@stackpole.com</p>	<p>T</p> <p>Wednesday 17, <u>Stackpole CSD</u>, contact Don Barber Don.Barber@stackpole.ca</p> <p>W</p> <p>Date & location TBA "Compartmentalize the Noise" * Daily Report-outs * Standard work for Leaders Contact Richard Kunst Richard.kunst@la-z-boy.com</p>	<p>T</p> <p>Wednesday 21, <u>Morrison LaMothe</u>, contact Tony Vita tvita@morrisonlamthe.com</p> <p>C</p> <p>AME Regional Conference Mon 12 to Thurs 15 K-W Ontario Contact www.ame.org</p>
July	August	September	October	November	December
	<p>W</p> <p>Date & location TBA "Establish Anchors" * VSWI ... Visual Work Instructions * TPM ... Total Productive Maintenance Contact Richard Kunst Richard.kunst@la-z-boy.com</p>	<p>T</p> <p>Wednesday 20, <u>Kraft Foods</u>, contact Hanif Jivraj hjivraj@Kraft.com</p>	<p>T</p> <p>Wednesday 11, <u>Stackpole PMC</u>, contact Cindy Grolleman cindy.grolleman@stackpole.com</p> <p>C</p> <p>AME National Conference Mon 16 to Friday 20 Dallas, Texas Contact www.ame.org</p>	<p>T</p> <p>Wednesday 15, <u>Messier-Dowty</u>, contact Richard Evans Richard.Evans@Messier-dowty.on.ca</p> <p>W</p> <p>Date & location TBA Your own "Get Organized" * 5S+1 Contact Richard Kunst Richard.kunst@la-z-boy.com</p>	