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LEAN THOUGHTS

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Chaku Chaku

The following article is reprinted from the August 2002 Boeing Frontiers Newsletter. The article was written by Kathlene Hanser, I think it does an excellent job of describing the powerful use of this under- utilized tool.

The term "chaku chaku" may sound funny to most employees, but it's serious business in Boeing's Portland, Ore., bevel gear-making organization.

Japanese for "load load," chaku chaku is an efficient style of production in which all the machines needed to make a part are situated in the correct sequence very close together. The operator simply loads a part and moves on to the next operation. Each machine performs a different stage of production, such as turning, drilling, cleaning, testing or sandblasting.

In the past, using the "job shop" method, these machines were located in separate areas of the factory, and each required a separate machinist to operate it. They turned out hundreds of parts in batches that were then loaded into baskets for transporting to another area, or simply sat there in stacks waiting until they were needed or the whole batch was completed.

"This equipment was large, complex and expensive," said Andrew Takamiya, Production System manager at Boeing in Portland. "By incorporating the fundamental principles of the Lean production preparation process and designing equipment specifically for the type and size of the parts being manufactured, we've reclaimed 2,076 square feet of factory space."

The machines in the new chaku chaku line are located in a U-shaped flow line. "The machines eject the parts automatically and everything is timed just right, so the operators don't spend time unloading or waiting," said machinist and Lean Manufacturing team member Jack Mitchell. "By the time the operator gets to the end of the line, the machine cycle of the first machine is completed and the whole process can start over again."
This flow line is assigned only those resources (equipment and labor) that are required for the specific activities to be performed. Included in the line are appropriate inspection tools to ensure no quality problems are passed on to the next operation.

Because each flow line is responsible for turning out a completed product, it is easier to keep track of how many parts are being produced and to stay on schedule. "We get a certain amount of raw material each day, so we know exactly how much work we have to do," said Mitchell. "Before, we were never sure how much would get done in one day, because one part might be held up in another area, preventing us from moving forward."

The road to chaku chaku began two years ago when a small team of employees in the Portland Fabrication organization took on the task of improving the flow of products through the factory.

The team decided to apply the Lean principles to the Next-Generation 737 bevel gear line, which represents 40 percent of the bevel gears produced in Portland. These gears drive the flaps on the 737's wings. This represented the first time within Boeing that the chaku chaku production concept was applied to such a complex process. The team used mock-ups to simulate the specific bevel gear production process and design the right-sized equipment for the line. Many of the unique machines were internally developed and built by the team. They also used a combination of modified surplus, existing and purchased equipment.

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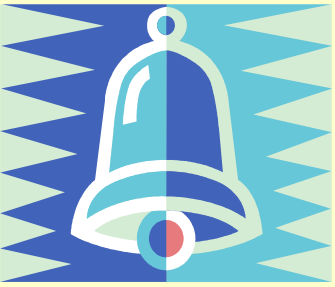

"This task required breaking down many barriers along the way, including the old way of using massive, complex and expensive machines to produce small parts," Takamiya said.

During this time, several team members traveled to Japan for advanced training. They learned how to incorporate all the necessary elements of Kaizen required to build a successful chaku chaku line. "Kaizen" is the Japanese term meaning the relentless process of finding and eliminating waste. It seeks continuous improvement through incremental change.

One element they put to especially good use is "setup reduction." One of the key machines in the line is a Gleason bevel gear generator, a 60-year-old machine requiring more than four hours of setup time. The team concentrated on the problem in numerous Shingijistu- and internally-led workshops and reduced the setup time to 241 seconds.

"Team members came up with many clever ideas and used lots of shop-made accessories to accomplish this goal," Mitchell said. "They learned what a determined group could accomplish when they set their minds to it—without spending a lot of money."

Phase I of the Portland chaku chaku line was completed May 14. One of the last jobs was to complete the traditional Japanese Daruma doll, which is really a soccer ball-sized head. The doll symbolizes the team's commitment to the project and was a gift presented to the team. Tradition calls for one eye to be painted at the beginning of a new project, and the honor of this task went to Christer Hellstrand, general manager of the Portland site at the time.

"This is one of the finest examples I have seen where natural leaders come forward and challenge the status quo," Hellstrand said. "It's a fine example of the extraordinarily talented workforce we have in Portland. I think it's our job as leaders to provide the environment where this type of teamwork flourishes—it's how we will continue to be competitive."

Takamiya credits the project's success to the working-together principle. "We involved many people who were not officially on the team as well," he said. "The combined experience, knowledge and efforts of everyone involved are responsible for overcoming the many challenges involved in changing existing long-standing processes."

2008 PINTO'S POINTERS TECHNOLOGIES & MARKETS

Here are my pointers and prognostications regarding the top automation technology and market trends that will gain traction in the coming year.

* Industrial Wireless:
Industrial wireless networks will quickly become integrated with standard plant and office networks. Beyond just wire replacement, there are lots of applications which will contribute to substantial market growth.

* Embedded intelligence & diagnostics:
Embedded operating information and self-diagnostics will minimize the need for scarce and expensive factory-service.

* Machine-to-machine (M2M) communications:
M2M will unleash a wave of productivity previously unseen - improved asset-management, and enhanced service initiatives.

* Automation system Security:
Most of today's automation & control systems use the same hardware, operating systems, and communications as broadly deployed networks. Security has become an urgent issue.

* Consumer tech in industrial automation:
Internet access via cellular phones, handheld PDAs and the like, is inevitably rubbing off in industrial environments. Specifically-industrial software applications are coming.

Success will come to the companies that understand how to combine and coordinate new technology, new thinking and effective solutions for customers in global markets.

Automation.com - 2008 Pinto's Pointers - Technologies & Markets:
http://www.automation.com/sitepages/pid3268.php

Contact me if you need coaching or facilitation help in the areas such as but not limited to; 5S, Value Stream Mapping, Set-up Reduction, Problem Solving or Policy Deployment and Consortium Development

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2008 Consortium Event Schedule

T our W orkshop C onference

January	February	March	April	May	June
T **Wednesday 16** Eaton Electrical, contact Joe Fisher, JoeRFisher@eaton.com	T **Wednesday 13,** ACE Bakery, contact Cindy Grolleman, cgrolleman@acebakery.com	T **Wednesday 19,** Nestle Waters, contact Mariela Castano mcastano@perriergroup.com	T **Wednesday 16,** CTS Corp., contact Bob Garces, Bob.Garces@ac.ctscorp.com **Consortium Shareshowcase** **Saturday 05** Eaton Milton. Contact Cindy Grolleman cgrolleman@acebakery.com or Joe Fisher JoeRFisher@eaton.com	T **Wednesday 14,** Stackpole CSD, contact Don Barber Don.Barber@stackpole.ca	T **Wednesday 18,** Morrison LaMothe, contact Tony Vita tvita@morrisonlamthe.com
July	**August**	**September**	**October**	**November**	**December**
		T **Wednesday 24,** Kraft Foods, contact Hanif Jivraj hjivraj@Kraft.com	T **Wednesday 08,** CGL Manufacturing contact Dave Deskur daved@cglmfg.com	T **Wednesday 12,** Messier-Dowty, contact Mike Smith Mike.Smith@Messier-dowty.on.ca	T **Wednesday 10,** Orenda, contact Brenda McIntosh brendamcintosh@orenda.com