IBMSystems
magazine

ALL-TERRAIN
SOLUTION

Kawasaki ditches kanban cards and accelerates its product assembly processes

BY JIM UTSLER ✦ PHOTOGRAPHY BY MATT MILLER

Working an assembly line was once a painstaking and messy job—especially in disorganized shops where parts were scattered everywhere. That's why many companies began using kanban cards, to help line workers keep track of parts inventory and locations. But these cards—which are actual, physical cards—created their own issues.

In the case of Kawasaki Motors Manufacturing Corp. U.S.A. (KMM), using the kanban cards added up to about $3,000 in payroll costs per day, according to estimates by Jay Kamradt, KMM IS supervisor. Not only was this process expensive, but it was also inefficient in some ways, despite the kanban promise of streamlining manufacturing processes. As Kamradt notes, the cards would sometimes be misplaced or lost, resulting in assembly line delays and too much inventory on hand. "Our goal has always been just-in-time manufacturing, so we had to find a suitable replacement for the cards," he explains.

By using several LANSA tools, including LANSA CodeStart ERP Frameworks, LongRange and Visual LANSA, the manufacturer now employs the electronic equivalent of the physical kanban cards. This has eliminated the $3,000-a-day card-handling cost, improved assembly line processes and significantly reduced on-hand inventory.

Bucking a Trend

Headquartered in Lincoln, Neb., KMM is a subsidiary of the Japan-based Kawasaki Heavy Industries. Although Kawasaki was once known primarily for its high-powered motorcycles, it has since branched out to include all-terrain and utility vehicles, personal watercraft, and even passenger rail cars, most of which are manufactured at the KMM facility. The customers for its utility and watercraft products vary, ranging from ranchers and farmers to construction workers, hunters or speed enthusiasts.

"We build all sorts of things here, as well as assemble the final products," Kamradt says. "Those products are then shipped and sold not only in the United States, but also throughout the rest of the world. We're kind of bucking the outsourcing trend."

It's also bucking the stand-alone server trend. Instead of deploying one-off boxes—virtualized or not—the company is using a consolidated IBM BladeCenter* PS700 running IBM i that's attached to an IBM XIV* storage system. The primary production application running in this environment was developed using LANSA CodeStart ERP Frameworks, which handles KMM's financials and inventory, among other functions. "It's homegrown, based on the LANSA framework, and over the years we've modified it to tightly fit our business model," Kamradt explains.

The company has also heavily modified how its manufacturing process works. In the past, this involved using kanban cards. In KMM's just-in-time manufacturing environment, these cards were used to signal the receiving department to deliver parts to the assembly line. For example, when parts inventory reached a predetermined level, the assemblers would turn a card in to the inventory department. The cards included information such as part numbers, part descriptions, the location

IS Supervisor Jay Kamradt says automating its processes saves Kawasaki Motors Manufacturing $3,000 a day in payroll costs.

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UP CLOSE

Customer: Kawasaki Motors Manufacturing Corp., U.S.A.
Headquarters: Lincoln, Neb.
Business: Manufacturer of all-terrain and utility vehicles, personal watercraft and passenger rail cars
Challenge: Reduce its reliance on manually intensive and costly kanban cards
Solution: Uses several tools from LANSA to electronically control many aspects of the assembly process
Hardware: An IBM BladeCenter PS700
Software: LANSA CodeStart ERP Frameworks, LongRange and Visual LANSA

of the parts in the receiving warehouse and where the parts should be delivered on the assembly line. "The kanban cards were the only way assemblers could get the parts they needed," Kamradt says.

Along the way, each of the approximately 4,500 cards would be touched eight times for an average of 10 seconds. The company ran a simple equation to see how much this cost, expressed as 8 x 10 x 4,500 = 360,000 (the total kanban-card touches per day). It further extrapolated that equation to come up with the associated payroll cost: $3,000 per day.

To further complicate things, each card had to be placed in a slit on a parts box, with the slits being made by inventory employees. Some 2,300 slits had to be made each day, also costing the company time and money. Although not as large as the kanban-card touch cost, it still totaled $191 a day. "This resulted in a lot of extra work, a lot of manual processes and a lot of errors," Kamradt says. "Not to mention the

potential for people getting injured while making the slits."

On the line itself, assemblers would hang grease boards to track the units they had to assemble for the day. As they progressed, they would use a clicker to stay on top of which parts they would soon need. This was hardly an ideal situation, with people sometimes not knowing what and how much was in inventory. This had the potential to halt the assembly process and leave assembly jobs literally hanging on the line.

Shuffling the Cards

Realizing something had to change, about eight years ago KMM began looking for an automated system to replace the kanban cards. At that time, however, some within the company deemed such a shift too hasty, given the kanban solution had been in place for decades. Others thought the technology available then wasn't up to the task.

But this initial groundwork benefited the company in the long run. Thanks to the efforts of Kamradt

and Paul Kramer, KMM's IS assistant manager, in 2012 when the time was finally right, the company already had a plan in place, including how an automated kanban system would most effectively replace its manual process, as well as the behind-the-scenes details of how all of the various components would integrate with the back-end system.

"We were able to use LANSA CodeStart to help allocate inventory, with the system communicating with the receiving department to indicate when an assembler was low on parts. This essentially eliminated the kanban cards," Kamradt recalls. "And the ERP inventory module was able to track inventory levels so each assembly line eventually became its own warehouse. We could tell exactly how much inventory was available at each line."

Of course, that's an abbreviated version of how the system actually functions. Using Visual LANSA, KMM built a dispatching system, of sorts. Employees in the receiving department can look at a screen that displays

Using a LANSA-based screen, assemblers can see when a part has been picked, when a label has been printed or when the part was delivered.

assembly line requests for parts. They then print labels they use when picking parts, applying those labels to the boxes rather than creating slits into which they formerly placed kanban cards.

On the manufacturing line, assemblers keep track of the movement of parts on a similar Visual LANSA-based screen. They can see, for example, when a label has been printed, when a part has been picked and when a part has been delivered. They can also create unit master records and work orders for units, allocate inventory and print documents associated with a unit.

If inventory allocations drive available inventory below a minimum level, pick transactions are generated. By default, a unit cannot be hung on the assembly line until all of the appropriate parts have been delivered to complete the manufacturing of that unit. This helps the company from building what it calls "crippled" or incomplete units, which can bring the line to a halt.

To facilitate the process, other employees, dubbed "parts police," help ensure the proper inventory is available on the line. Using an Apple iPad application developed using LongRange, they can remotely request parts picking and delivery to the line, ensuring inventory levels are neither too high nor too low.

"It's their job to make sure inventory is as accurate as possible, so they'll do things like take a cycle count at each location or they'll take a part out of inventory if an assembler finds a problem with it and tosses it in a scrap

bin," Kamradt says. "Before, a supervisor would have to go through the bins and account for these parts at the end of the day and someone else would have to key that into the system, which might create a day's lag in reporting. Now, with the iPads, it's all real time."

Additionally, the parts police can:

- ❯ Perform remote inventory inquiries
- ❯ Move inventory to or from locations on assembly lines
- ❯ View pick transactions and their status
- ❯ Receive parts that have been picked in the receiving warehouse for the assembly lines

Notably, they can also account for what are called Engineering Change Notices (ECNs), dictating, for example, that an updated bolt should be used in place of a previous one. Prior to the LongRange application, this involved manual processes, with the parts police required to add the bolt to the bill of materials, track the unit the bolt went on and then record the VIN number of that unit.

Now they can see ECNs on their iPads, tap on the notification for details, determine what the ECN parts are and see if any related pick tickets for those ECN parts have been generated. If not, they can request a pick in real time to ensure the part is delivered to the assembly line. The application then records the associated VIN without anyone having to manually update the back-end system.

"With the old system, we would have to write down the VIN of the affected unit. Now, we're automatically recording every VIN of every unit the new part is used in," Kamradt explains. "Initiatives such as this have made us smarter to improve our overall processes."

Right There, Right Now

This is in keeping with KMM's Kawasaki Production System (KPS), a philosophical approach to creating a more efficient workflow incorporating worker involvement to build the best products possible. Now that the Visual LANSA and LongRange applications have been tightly integrated with the company's LANSA CodeStart ERP Frameworks back-end system, the KPS philosophy has only become more ingrained in the KMM culture.

"We've always worked smart and hard, but now we're doing it more efficiently," Kamradt says. "We don't have to worry about kanban cards, slits in boxes or off-kilter inventory. And because everything is right there, right in front of us, we're saving a great deal of money and the solutions we've implemented are going to pay for themselves within a year. That's a pretty good return, in my opinion." Ⓟ

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