LATTICE TECHNOLOGY

Leverage 3D Across
Your Product Lifecycle™

Customer Story

Mitsubishi Agricultural Machinery

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Concurrent Engineering:

Mitsubishi Reduces Lead Time from Design to Production

Mitsubishi Agricultural Machinery (MAM), part of Mitsubishi Heavy Industry Group, designs, manufactures and sells agricultural machinery. To better meet the needs of a rapidly changing market, Mitsubishi adopted a strategy known as concurrent engineering, using Lattice Technology's advanced 3D data format called XVL®.

ULTRA-LIGHTWEIGHT XVL ADVANCES CONCURRENT ENGINEERING

Concurrent engineering is a work methodology that promotes a parallelization of tasks. For example, job functions such as design engineering and manufacturing engineering are integrated, which allows workers to reduce the time needed to bring new products to market.

Using the XVL solution, MAM dramatically changed the workflow of their assembly process and work instructions to take advantage of concurrent engineering. Visualization in 3D with the related instructions of the assembly process enables users to quickly and easily understand the process.

XVL is typically one half of one percent (.5%) of the native CAD model size, while still maintaining accuracy. This ultra-lightweight format allows users to consume extremely large assemblies with thousands of parts on standard PC desktops and laptops, as well as on mobile devices like the Apple® iPad®. In addition to being ultra-lightweight, XVL is uniquely suited for creating enhanced, intelligent models that can include animations, annotations, PMI (including GD&T) and work instructions.

Using Lattice Technology's XVL, MAM can now operate product design and industrial engineering simultaneously. This type of concurrent engineering (Figure 1) allows them to reduce lead time from design to production.

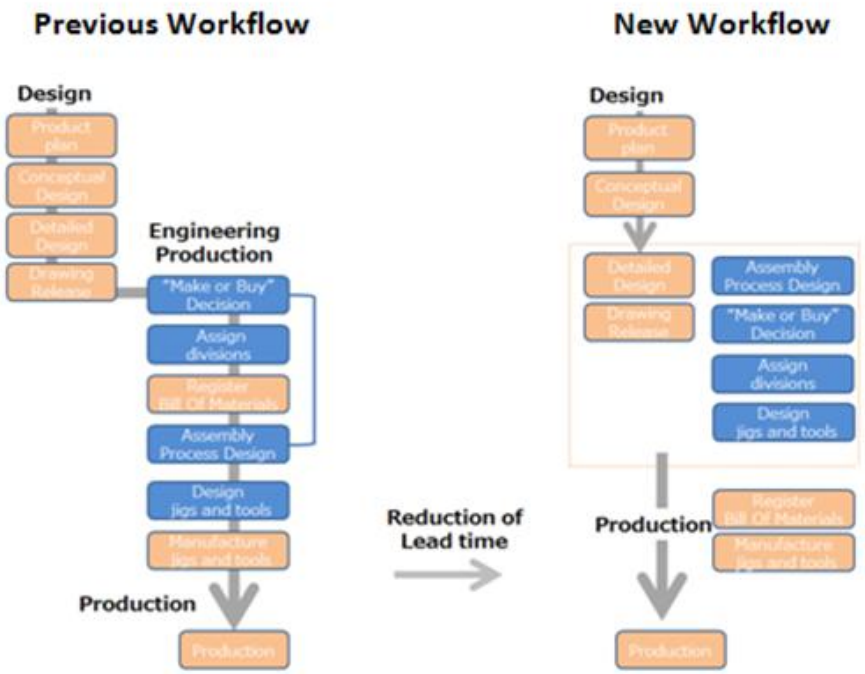

Figure.1 Concurrent Engineering

CHANGING WORKFLOW TO PRODUCE PRODUCTS FASTER

MAM struggled with the problem of developing and producing products fast enough to meet the market needs. To produce products faster, they set out to change their workflow. Prior to XVL, production preparation was done after the assembly process design, which left no time to tune the assembly process.

Before introducing XVL, work instructions at MAM were based on the industrial engineer's experience and know-how. Engineers would first check the part geometry from blue prints. Next, they would simulate the order of the assembly process, based on their experience. Workers would then proceed with assembly process definition and work instructions development.

Of course, this type of work flow demands many years of experience. Succession planning (transition from expert workers to novice workers) was a serious issue. Passing skills and know-how of veteran workers to young workers was vital and required long term planning.

To solve this problem, MAM implemented *XVL Studio*, Lattice Technology's core authoring tool for turning 3D design data into 3D manufacturing data. *XVL Studio* enables digital manufacturing, digital mock-up (DMU) and technical illustration, across the enterprise–directly from 3D data.

Using XVL Studio, MAM digitally created the assembly process. The assembly process was then verified digitally within XVL Studio using the accurate 3D model (Figure 2).

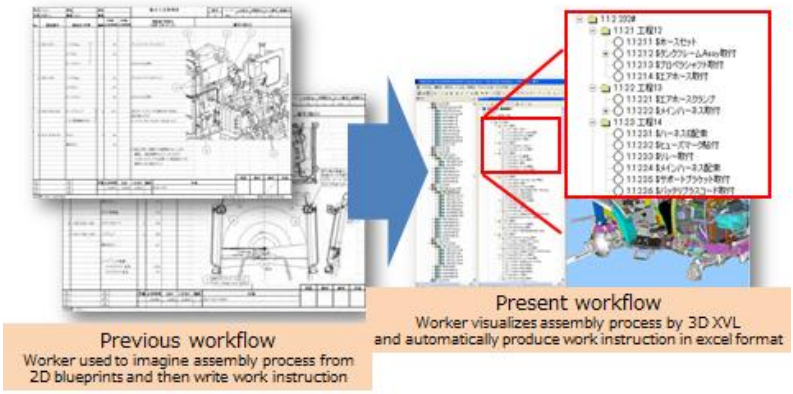

Figure.2 Assembly process design work flow in MAM

With the new workflow, workers can simulate the process and consider the tooling and jigs needed by using the actual part geometry--even when the model is still in design. XVL allows visualization of the assembly process, enabling the designers to see the product design from the perspective of an experienced assembly process designer. If any problem arises in simulated assembly process, the design team has the opportunity to change the product design using XVL.

PLEASED WITH XVL'S INNOVATION

"Introducing Lattice Technology's XVL solution has resulted in motivation to change the workflow of the assembly process and work instructions," said Masashi Kawamoto, Development Management Division at MAM. Kawamoto went on to say that feedback from assembly process designers has been positive. "They are pleased with the innovation of the XVL solution."

XVL is now a crucial tool for the assembly process designers at MAM. Digital documentation of the assembly process was adopted without any difficulties. Using XVL, work instructions (attached to part geometry and animations) can be easily added. Lattice Technology offers multiple choices for consuming the interactive 3D and associated information such as work instructions. These choices include Microsoft® Excel®, interactive web pages and a browser-based Windows® application. MAM uses the free add-on for Microsoft Excel (see Figure 3 below). When viewing the assembly in Excel, the part name is selected and the matching part in the 3D model is highlighted.

Users can also save view information such as the orientation, layout, and camera angle of a 3D model. This feature, called Snapshot, is capable of restoring the position of a 3D model with only one click. Users can optimize their work instructions by creating snapshots that suit their purpose (Figure 3).

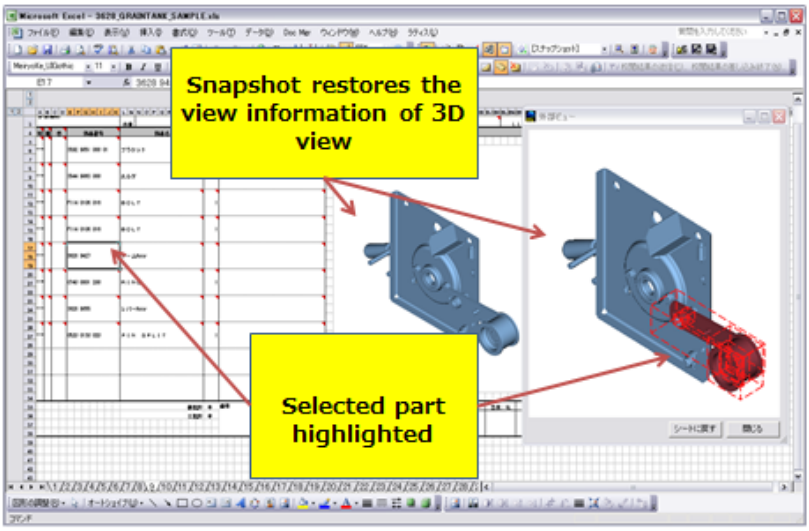

Figure.3 3D model embedded Work Instruction in Excel file format

Accepting change is difficult for every organization. However, by choosing the Excel option for distributing 3D models and associated data, the new process was accepted very well. If the new method had changed the entire structure of the previous work flow, the engineers at MAM may not have been as eager to implement XVL.

Continuing to use Excel for documenting work instructions has contributed to dramatically changing the workflow of the assembly process. Kawamoto concluded, "Workers might think that introducing XVL was a small change; however, when you focus on the importance of accurate work instructions, delivered with a tool that people are accustomed to using, you will realize that XVL has brought great change." The change to use XVL in combination with Excel has allowed concurrent engineering to be realized at MAM. This new workflow allows MAM to bring new products to market faster.

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