INDUSTRY 4.0 - WHAT IS THE HYPE?

Lean manufacturing- a concept that was embraced and implemented worldwide for manufacturing. However, lean manufacturing is so 2010. Today, you need to be on the Industry 4.0 bandwagon if you want to survive into the next decade (2020). Governments, associations, universities and any business advisory firm are all talking about the fourth revolution for manufacturing. If you pay attention to the hype- you need to adapt and change or else... you are doomed, closed, out of business.

So, what exactly is Industry 4.0? Well, if you can put the words manufacturing, digitisation, automation, connection and efficiency together in one sentence then you've got the idea. The Australian Government Department of Industry, Innovation and Science defines it as, 'Industry 4.0 uses transformative technologies to connect the physical world with the digital world' Clearer? An easier way to consider Industry 4.0 is simply machinery and communication. Machines connecting and communicating with each other. Machines self-monitoring and analysing. Machines autonomously managing production. Machines creating superior cost efficiencies, better quality goods, improving production and increasing flexibility. In other words, machines autonomously managing production in a flexible, efficient, and resource-saving manner.

How does Industry 4.0 relate to the timber frame and truss industry? If you think your linear saw is the answer then you are on the right path. However, your linear saw alone does not make you Industry 4.0 compliant. There is no doubt that linear saws have revolutionised the production of timber frames

and trusses. However this is only an 'incrovation'- an incremental innovation. To really embrace Industry 4.0 your machinery needs to be doing a lot more!

In an Industry 4.0 context, real time decision making is imperative. The term used for this is 'Big Data and Analytics'. In simpler words, your production equipment, enterprise and management systems all need to be talking to each other. The information they give you needs to be what business decisions are based on. To be able to use data and analytics to inform decisions, you will need horizontal and vertical system integration combined with the Industrial Internet of Things.

Still with me? It might be easier to unpack some of the theories behind Industry 4.0 by highlighting the actions Vekta is taking to ensure our customers are ready for the next big change in manufacturing.

Vekta has invested in ensuring our machines are able to post real time data in a number of formats, and support a wide range of Factory Management Systems. Web based technologies are used to make it easier for both management and operators to interact efficiently with products using personal devices such as tablets, computers and smartphones. Live production statistics, material picklists, even remote viewing and control can be achieved easily from mobile devices. You could be sitting in your office (or at the beach) and be able to see exactly what is happening in production in real-time.

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To address Industry 4.0 requirements, Vekta is also investing in background infrastructure development that will enable products to directly interact with cloud-based systems aimed at improving the customer experience. The ability for field devices to interact and communicate with more centralized components is an example of the Industrial Internet of Things. What does this actually look like? In 2020, Vekta's products will be able to 'phone home' and report information such as software version numbers, production statistics and even complete automated back-ups. What are the benefits? Well, let's consider a new software bug is discovered and rectified by the Vekta Engineering team, Vekta can then use the central portal to immediately identify in real time which systems globally are affected and implement the changes. Other applications of this technology include production benchmarking (enabling each site to see how their operation performs against the status quo), targeted product development based on common issues found at various sites, and (as mentioned) automated tools for software updates and backups.

Ok, so that is some of the higher-level aspects of Industry 4.0. Now for the fun- Autonomous Robotics

Machines that can make their own decisions and then perform an action accordingly. It would be easy to think that your average CNC linear saw fits into this category. However, your average Linear saw is pre-programmed to perform a repetitive movement. They are not able to react. Roomba is the best example of an autonomous robot in the current commercial market. The little vacuum cleaner can perceive its environment and make a decision based on those perceptions.

An example of autonomous robotics for the Frame and Truss industry is the Vekta PackFeeder. The PackFeeder communicates with the Linear saw as to what piece of timber is needed next. The PackFeeder then picks the timber and delivers it to the saw. In essence, this action is not Industry 4.0 compliant. However, the PackFeeder has added abilities to make decisions and then act. For example, the Bow detection and Flipping module. The machine includes sensors that is able to tell if a piece of timber has a bow in it. The machine is then able to decide if the timber needs to be flipped based on the cut and use of the timber. If needed, the board is flipped. Sensors are also used to detect the condition, state and location of the packs of timber and decisions are automatically made to ensure the linear saw is continuously fed.

The combination of the PackFeeder and the Razer Linear Saw is exactly what Industry 4.0 is aiming for. Machines that are communicating with each other, making their own decisions and therefore increasing production, efficiency and quality of product. Yes, reducing human interaction is also an integral part, however the theory is that people power will be better used in other business areas.

In Industry 4.0, 'Simulation' is the ability to mirror the physical world in a virtual model, allowing operators to test and optimise machine settings for the next product in line before completing the task in the real world. This is one area where your Linear saw (should) be proficient. The optimising software on a linear saw should do just that- test all the possible parameters for a piece of timber and cuts needed and then produce the best option based on predetermined qualifications (eg minimising waste).

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Vekta is continuously investing in improving the optimisation software ('Simple') of the Razer Linear Saw with regular updates available for all customers. There are three main ways that 'Simple' stimulates production to ensure the best options are considered.

- Batch optimise- The software has the ability to run through hundreds of jobs, saves the results and produces a summary report to assist in making high level optimising decisions. The report demonstrates how changes in settings and the length of timber available will affect cost and waste over a large sample of jobs.

- On the fly optimise- Allows a board of an unknown length to be fed into the saw. The saw takes seconds to automatically measure the length of the timber, and optimise members to suit the piece of timber- a great function for using up off-cut lengths and random packs of timber.

- Auto-optimise- In seconds, Simple optimises a job several times (hundreds) with slightly different settings each time. The solution that best suits the customers requirements (cost or waste) is chosen. The computer does the simulation before completing the task.

Vekta is a company at the forefront of technical innovation and invests heavily in the development of new machines to do a variety of tasks. However, ensuring new machines will not become obsolete in the near future is just as important as developing the new machines in the first place - and this is where Industry 4.0 comes in. Industry 4.0 is considered the fourth major Industrial Revolution - i.e. major changes in how industry works. Equipment manufacturers today should be taking steps to ensure their products are following this global change and guiding customers on how to become Industry 4.0 compliant.

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