

Flexible Automation

The Solution to Meeting Manufacturing's Modern Challenges



Introduction

The manufacturing industry is on the verge of a fourth industrial revolution, driven by the rise in automation and digitally-driven processes. Also known as Industry 4.0, this new era will see the intelligent interlinking of production systems to increase efficiency, productivity and support industry growth. But why is another industrial revolution necessary?

“While ‘lean’ has been around since the 80’s, new technologies are finally making it more achievable.”



Challenges

The manufacturing industry has endured a number of challenges in recent years that have seen it necessarily pursue an agenda of increased efficiency, reduced waste and maximum output. There has been a marked increase in demand for small-batch & on-demand production, which has been further impacted by the rise in eCommerce, which demands the optimization of supply chains and elimination of error. Many companies have also suffered financial pressures due to rising domestic production costs and globalisation facilitating increased international competition.

For many decades, the philosophy of ‘lean manufacturing’ has sought to eliminate waste in supply chains, maximising quality and efficiency. Industry 4.0 is taking ‘lean’ to the next level, making it more easily achievable and more effective. The ‘lean’ ideology was born out of the Japanese manufacturing industry and is most often associated with Toyota. While ‘lean’ has been around since at least the 80’s, and has long been a goal of many manufacturing organisations, new technologies are now making ‘lean’ manufacturing more easily achievable.

Why is Flexible Automation the Answer?

The ‘lean’ philosophy identified 7 types of waste – overproduction; inventory; conveyance; correction; motion; processing and waiting. The aim of lean, and of flexible automation, is to increase efficiencies and reduce waste, activities that contribute to bolstering the health of your bottom line.

Automation can be classified into three categories: fixed, programmed and flexible. Fixed, or hard, automation uses special purpose equipment to automate a fixed sequence of processing or assembly and it is difficult to alter or change the design. Programmed automation means the equipment has the capacity to change the sequence of operations to accommodate different product configurations, thanks to a coded program. By coding a new program, the system is able to produce new products, however this kind of automation still usually requires manual changeovers to switch products. Flexible automation is an extension of programmed automation that allows a greater variety of products/parts to be manufactured on the same equipment without the need for manual changeovers or re-programming.

Flexible automation in particular lends itself to the FMCG, which often needs to be altered depending on where it will be distributed. This can mean a large number of changeovers for multiple small batches of a single product, and this issue becomes more pronounced as companies pursue global distribution opportunities. Changeovers are extremely time consuming, and also increase the risk of error and injury should a worker be rushing the changeover to meet productivity deadlines.



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Solution

SICK provides a range of solution suites tailored to address the different challenges present in particular manufacturing sectors. All of SICK’s systems are open format, allowing them to be easily integrated with a company’s existing equipment, which eliminates the need for a costly upgrade of your machinery.

One company that has experienced significant improvements with SICK systems is Proctor & Gamble. This multinational corporation is parent to a huge stable of brands, many of which are distributed globally. After implementing SICK’s RapCo solution across their entire production line, P&G was able to reduce product changeover time from 24 minutes to just 77 seconds, a phenomenal improvement in efficiency.

The IO-link and Rapco systems allow plant managers to view the production process as a whole, to drill right down to the minutiae and make adjustments or alter their systems ever so slightly from a central dashboard. IO-link allows applications to be loaded, which creates efficiencies in timing and allows lines to be run at a faster rate and have higher throughput of a higher quality.

This also helps facilitate improved efficiency in all steps of the supply chain. For example, as a product is being completed, transport is notified to pick it up, distribution is made aware of its imminent arrival and replacement inventory is brought in to make new product, ensuring your company is always equipped and ready to serve its customers.

[1] Krafcik, John F, "Triumph of the lean production system", *Sloan Management Review* 30 (1): 41–52, 1988.

[2] Leading Edge Group, "Identify 7 types of waste in lean manufacturing", 16th September 2013:

<http://www.leadingedgegroup.com/australia/inside-the-lean-courses-identify-7-types-of-waste-in-lean-manufacturing/>

[3] Society of Mechatronics Engineering & Technology, "Different types of automation", 2013:

<http://sommec.wordpress.com/2013/03/09/what-are-different-types-of-automation-or-compare-hard-automation-and-soft-automation/>



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