

Utilization of lean concepts in automated manufacturing systems

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ABSTRACT

This competitive air of creation and high work cost, motivate organizations to utilize innovations like automation as a mean to build manufacturing competitiveness. Then again organizations know about cost reductive policies like lean generation which has indicated noticeable accomplishments. This paper focuses on automation in lean manufacturing it discusses principles of lean manufacturing, lean implementation, constraints in lean implementation, challenges in automation of lean manufacturing, development of automation in lean environment and working of automation and lean together. . In this circumstance, so as to have lean endeavor, it is imperative to locate a reasonable picture of challenges and potentials of actualizing automation inside a lean environment. In the event that the way toward developing automation isn't proficient and companies' methodology and mission isn't considered in time of project advancement, the outcome may not be lean toward the end.

1. INTRODUCTION

The development of complex socio-technical systems, which the development of automation solutions could be describe have been object of study within multiple fields of research which subject to lean product development

Manufacturing has been perceived as the power hotspot for the development of the economy. Manufacturers in the industry have been looking to the elevated challenges from the consistently changing globalized environment.

With overall aim to support the successful use of automation in industry. The Key to a successful use of automation therefore lies in finding, selecting, acquiring and properly implementing the right type and level of automation in relation to company needs.

The fundamental thought is that an effective production can be accomplished by a far reaching way to deal with limit wastes. All manufacturing industry has invested continuous effort for its survival in the current incautious and aggressive economy.

2.0 LEAN PRODUCT DEVELOPMENT

Lean production is a well-researched area but there has been comparatively less research done to apply lean thinking to product and process development.

Authors from the fourth category have received the most attention through their careful studying of the product development practice at Toyota and by capturing the essences of TPDS which entails more than just lean production .

In line with the first principle Ward (2009) point out that the foundation in a Lean Development System is understanding what is value in development before you can design the system that should produce it. When designing the system, focus should with a lean mindset be to eliminate waste in the process.

2.1 Flexible automation solutions

Proper testing is essential when evaluating potential lean automation systems, according to Jamie Flinchbaugh, a founder and partner of the Lean Learning Center (Novi, MI), who advises employing a scientific approach to analyzing manufacturing process needs.

It's that sort of experimentation in the Plan, Do, Check, Act cycle that I think we most often miss when we using technology," Flinchbaugh states. "We also don't test the concept, we don't test the idea, before we jump to the solution, and so we really have to get better at finding cheap and easy ways to test the idea. Let's just say it's computer technology—if I can't make the process work on paper, all the computer does is make it go faster. So if it's a broken process on paper, it's just going to be a broken process going faster on the computer."

2.2 Proper analysis of processes

People are getting much smarter about using lean techniques in the manufacturing world. But the world doesn't just shift on a dime; you have a lot of people who have been trained to do

manufacturing one way, and they've been doing it that way for five or 10 years, and often you can meet up with resistance when you're starting to re-work the processes and install new equipment, or change the way things happen.

If it does turn out that automation is the best way, it's important to look for a flexible system that isn't welded steel; maybe it's bolted-together technology that lets you change it around, if you need to change your process later, because you're probably going to. That's what lean is all about, continuous improvement.”

2.3 Autonomation

Lean manufacturing systems are complemented by the application of robots in many ways, according to Dick Johnson, general manager, material handling, Fanuc Robotics America Inc. (Rochester Hills, MI). Newer vision systems add intelligence to robotics and play a big role in increasing the quality of parts, which can optimize lean manufacturing.

That's going to improve for a couple of reasons; because the robot continuously loads the machine, as long as there are parts, the machine comes up to temperature and is happy—it makes better parts. It makes worse parts at the beginning of production.

2.4 Using Simulation

So as to have estimation over up and coming automation projects it is proposed to simulate the process. The capacity to picture the developing office, the capacity to discover more detail data with respect to the process and furthermore the capacity to locate the optimum solution are a few instances of simulation.

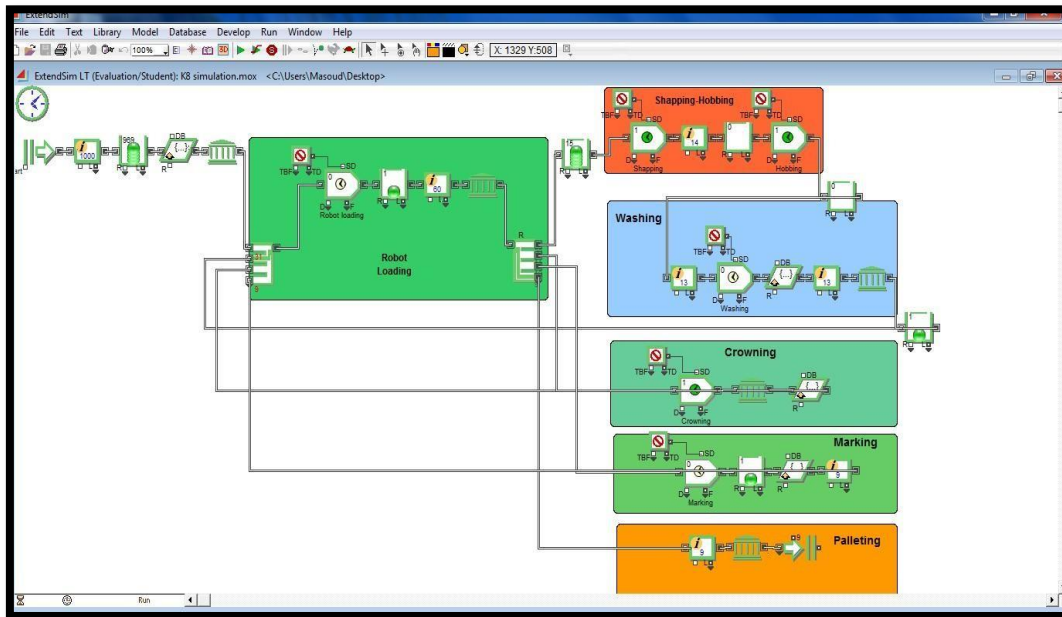


Figure 1. Simulation of K8 process

2.5 Use Extended VSM

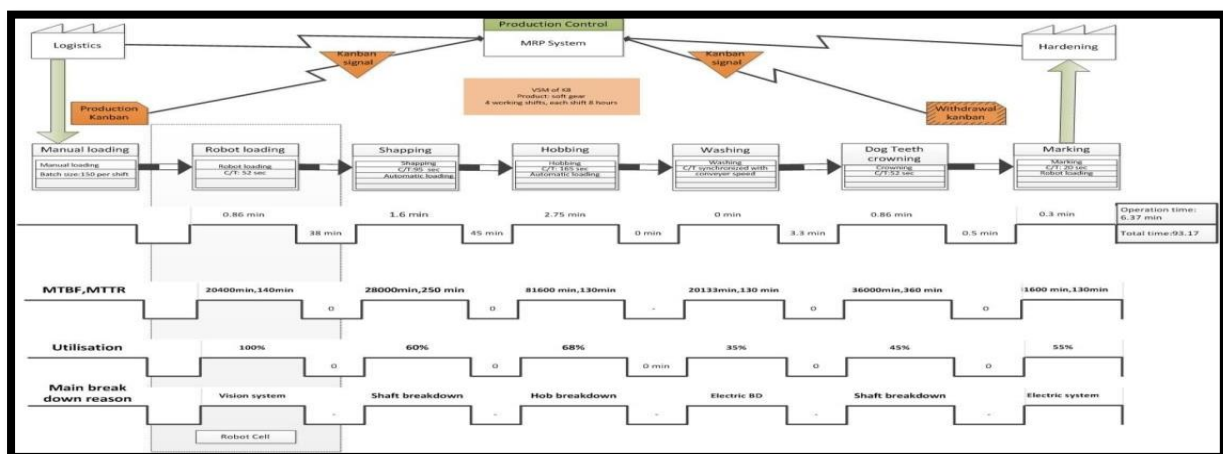


Figure 2. An example of Extended VSM of K8

This VSM incorporates a few data that can speak to the cell circumstance through snappy look. For example, notwithstanding process time and process duration different sorts of data, for example, MTTR, MTTB, use of each machine or robot and fundamental explanation behind breakdown amid explicit length can be separated from broadened VSM.

3.0 Design Infrastructure

Lean Automation is one of the largest company focused on industrial automation and information, dedicated to making our customers more productive and the world more sustainable, tremendous importance is given to develop world-class designs, we follow industry-leading practices in design development, state of the art workstations are used by our team of experts for superior results, we develop designs which are technologically and commercially most effective variants, handle the design and planning work, and bring up the project to a successful conclusion at your chosen location, we take utmost responsibility for executing the entire project.

3.1 Manufacturing Infrastructure

Lean Automation is largely involved in Intelligent manufacturing research focuses on intelligent manufacturing systems, modelling and design of distributed artificial intelligence for manufacturing shop floor, networks and supply chain management and optimisation, and holonic manufacturing systems.

The global marketplace, many companies are shifting from product-driven operations to customer-centric, demand-driven manufacturing environments, Reliability & efficiency are essential in manufacturing industrial equipment,

- Total Shop Floor Area of two plants of 30,000 sq ft for assembly & trials
- Office Space of 5000 sq ft
- MSEB Power 200 KVA and 250kva
- 150KVA and 65KVA Generator for power back up
- Stabilized weld power for Robotic Trials
- Machine Shop for rework activity during Assembly & Inspection
- Paint Shop



4.0 CONCLUSION

Manufacturing industries are under huge weight from the relentlessly competitive overall market to improve the efficiency and productivity of their production activities. Under such conditions, various industries are implementing distinctive change management projects, for instance, Total Quality Management (TQM), Total Productive Maintenance (TPM), Six-Sigma (SS), Lean Manufacturing Systems (LMS, etc. Among such projects, LMS has pulled in the thought of managers significantly, as clear from the amount of case studies and participating organization in the diagrams that are represented in the literature.

Lean is a culture – a long haul philosophy that must influent the whole company and everything must be completed in small advances and offer some incentive added time to the process and the employees for it to work in the long time.

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