

Jidoka

Japanese manufacturing techniques have had a major affect on the approaches taken in manufacturing and management in manufacturing companies today. Many terms like JIT, Toyota Production System, Lean Manufacturing, Kanban, Pull System, etc. are common buzz words that are heard on many shop floors or in war rooms throughout the manufacturing industry. One term that goes along with Japanese manufacturing practices is *jidoka*. Rosenthal (2002) states that the Toyota Production System is often modeled as having two pillars, with one of the pillars being JIT and the other *jidoka*. There are varying definitions for the term *jidoka*. Standard and Davis (1999) translate *jidoka* to mean “quality-at-the-source”, and Imai (1986) and Monden (1983) refer to it as meaning “autonomation”. *Jidoka* has two different meanings in Japanese. One of the meanings is automation – changing a manual process into a machine process. The other meaning is “automatic control of defects” (Monden, 1983, p. 141). This meaning incorporates the insight or mind of a human to troubleshoot and correct failures. Toyota refers to this type of *jidoka* as “Ninbennoaru *Jidoka* or, literally translated, ‘automation with a human mind’” (Monden, 1983, p. 141). The short definition for *jidoka* would be a process or technique of detecting and correcting production defects. It always incorporates the following devices: a) a mechanism to detect abnormalities or defects, and b) a mechanism to stop the line or machine when abnormalities or defects occur (Monden, 1983). The way *jidoka* achieves its purposes in Toyota can be seen in Figure 1.

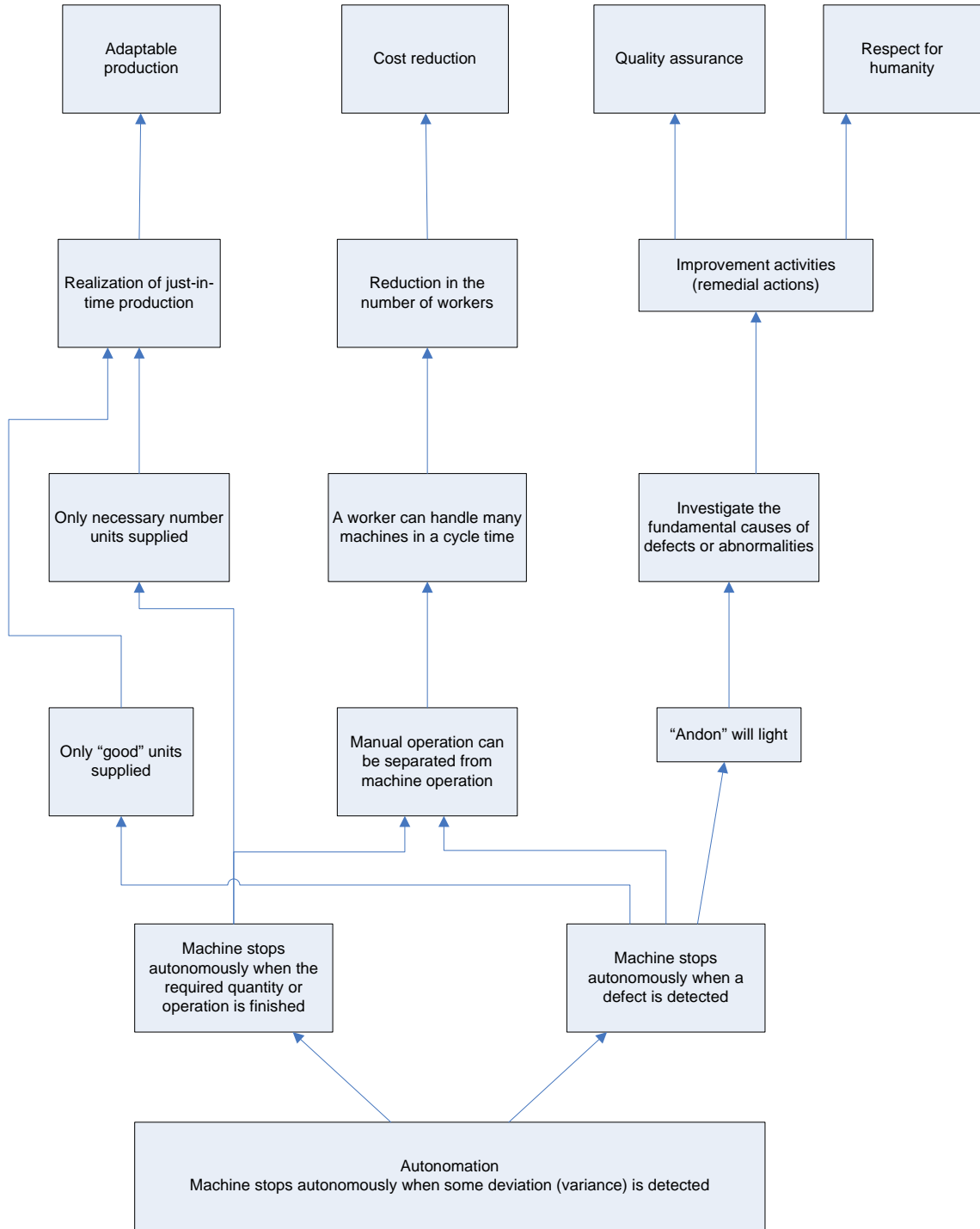


Figure 1 - How automation attains its purposes as adapted from (Monden, 1983, p. 142)

By involving the human mind in jidoka, there are two methods to stop a line. One method involves the judgment of the line worker and the other is the machine shutting off with its automatic devices. The first method requires line workers to be empowered to shut down production to address problems. A common tool used when a line worker shuts down the line is an *andon*. An andon signals to the rest of the shop floor that something is wrong and needs to be addressed. The problem is usually addressed by a team of individuals. A tool used for shutting machines down is *poka yoke*. Poka yoke, or fail-safing, is a practice of ensuring that defects can not occur. Examples of poka yoke can include things like automatic switches, lasers, jigs, etc. Whenever a defect is detected or whenever the specified amount of product is produced, a signal is sent to the machine to shut down. This practice frees up line workers to be able to manage more than one machine at a time.

An example of jidoka in practice can be found in Toyota. Between processes is a mat like those that trigger a door to open at a supermarket. The assembly line is moving at a constant rate. If a worker does not finish his operations in the specified amount of time, he will step on the mat, and, in doing so, will shut down the line. This will focus attention on his area to troubleshoot why it is taking him longer than specified. Another example would be lasers and limit switches that detect the length of various parts. If the parts do not meet the requirements programmed into the system, a signal will be sent to cause the line to stop and workers will begin to address the problem.

For further learning on this topic, it is suggested that the reader start with any of the references used for this paper, Shingo's book *Zero Quality Control: Source*

Inspection and the Poka-yoke System or other websites such as: www.lean.org or www.sme.org.

References

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