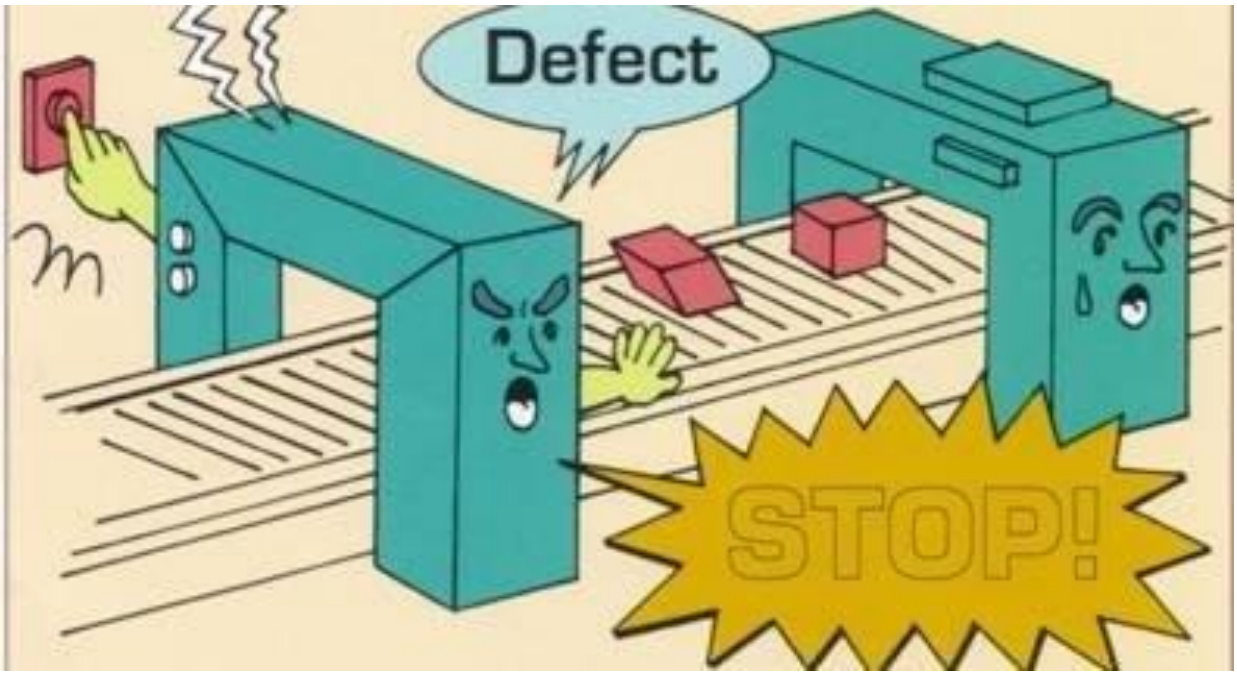
Study Guide: Jidoka (or Autonomation)

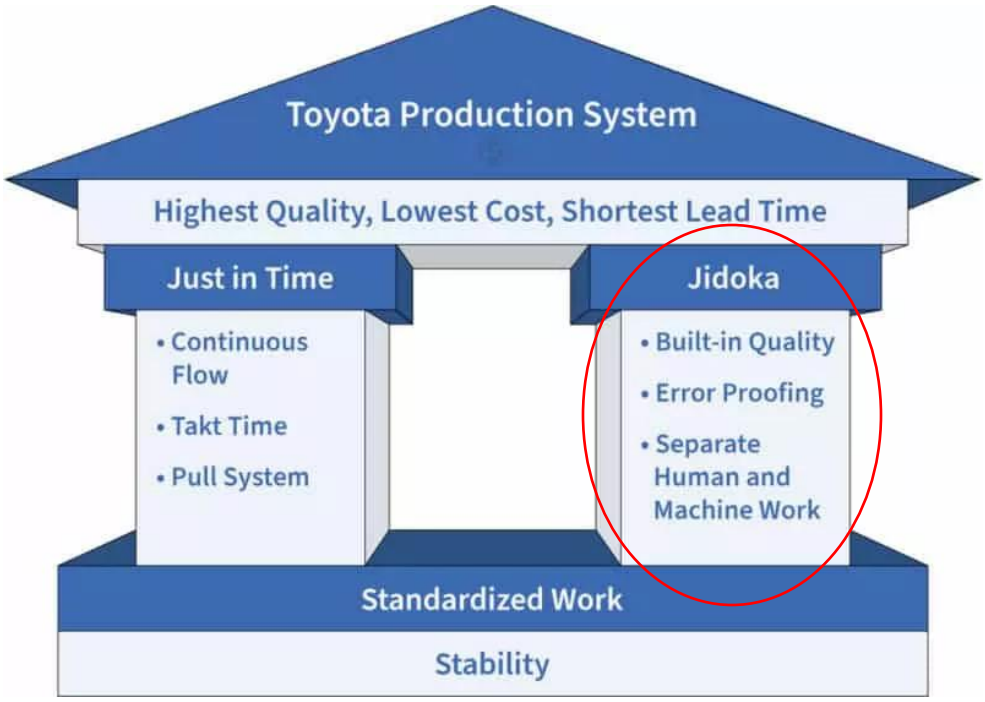


This course provides a foundational understanding of the concept of Jidoka, also known as Autonomation. It is often described as automation with a human touch.

What is Jidoka?

Jidoka is also known as:

- Autonomation
- Intelligent Automation
- Automation with a Human Touch
- Automation with Human Intelligence



Jidoka is one of the two pillars of the Toyota Production System, along with Just-in-Time (JIT). It is often one of the forgotten principles. It is based on building quality into the process.

History of Jidoka

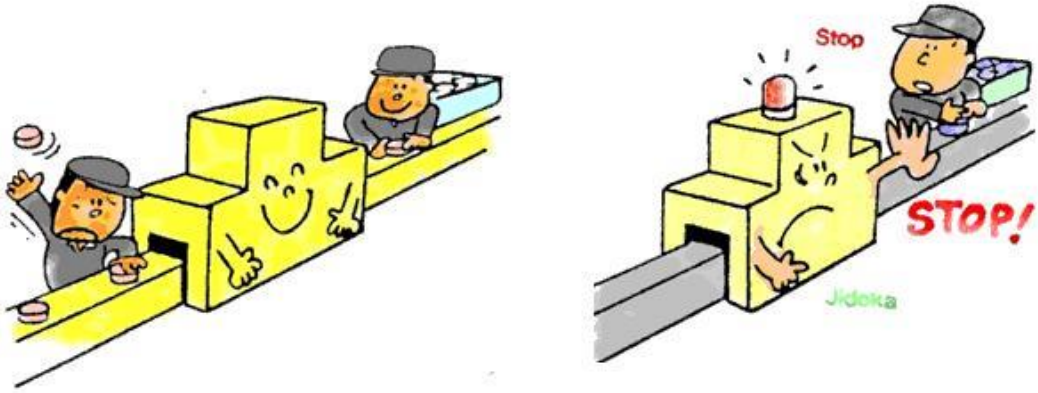
- First used by Sakichi Toyoda in 1896
- Started as a simple device to stop the shuttle of an automatic loom if there was an issue
- It identified if the thread was broken and stopped the loom to avoid producing defects
- Afterward, the loom operator was required to fix the issue and resume the process
- It allows one operator to run more than one machine at a time and dramatically increase productivity
- A UK company purchased the patent, providing the funding for the Toyota Motor Company

Goals of Jidoka

Allows the operation to have build-in-quality and avoid passing issues down the value stream

- Don't accept defects from upstream
- Don't produce defects
- Don't pass defects downstream

Jidoka allows operators to identify issues when they occur and take corrective action at the source. It separates workers and technology by enabling the tech to self-correct so that humans can focus on more complex activities, like handling several machines at once.



There are 4 principles of Jidoka:

1. **Separate human's and machine's work** - Human's work and machine's work are separated for better efficiency
2. **Stop the line and fix the problem** - Stop and notify for an abnormality. Never let a defect pass to the next station
3. **Built-in quality at each process step** - Attack waste at the source. Develop a mindset of doing it right the first time.
4. **Prevention** - Analyze the root causes. Implement countermeasures and improve continuously

Concepts and Tools of Jidoka

How Jidoka Works:

1. Machine detects a problem and communicates it
2. The line is stopped
3. Manager/supervisor removes the cause of the problem
4. Improvements are incorporated into the standard workflow

This becomes a continuous cycle that builds quality into the process

The Jidoka Process

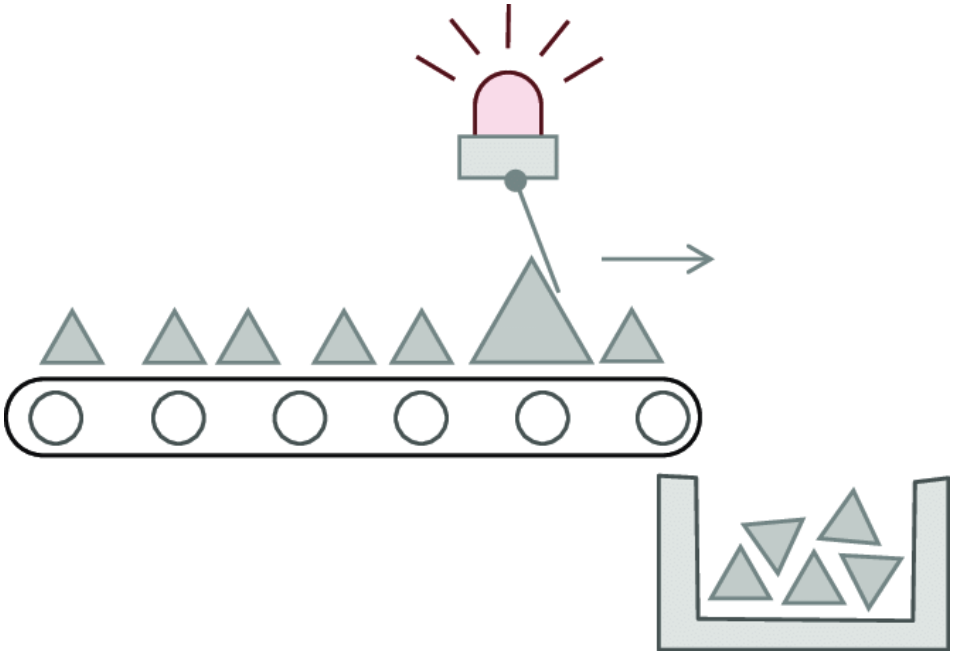
There are 4 kinds of tools for applying Jidoka:

1. Andon
   - Japanese word for "paper lantern"
   - Refers to a visual display that shows status information
   - Often combines with an audible system such as an alarm
   - Can also be used to signal the need for replenishment of parts
2. Andon Cord
   - A mechanism, usually a rope, that an operator can use to stop the line to address an issue
3. Fixed Position Stop
   - A position in the process where an issue is to be addressed within an allotted time. If the issue is not addressed within the allotted time, the process will be stopped.
4. Poka-Yoke
   - A Japanese term meaning mistake-proofing
   - Refers to low-cost devices or innovations that make it impossible to make mistakes
   - It helps people to make things right the first time
   - The goal is zero defects

How to Implement Jidoka

Steps of Jidoka:

1. Detect the abnormality
2. Stop the line
3. Fix or correct the immediate condition
4. Investigate the root cause and install a countermeasure

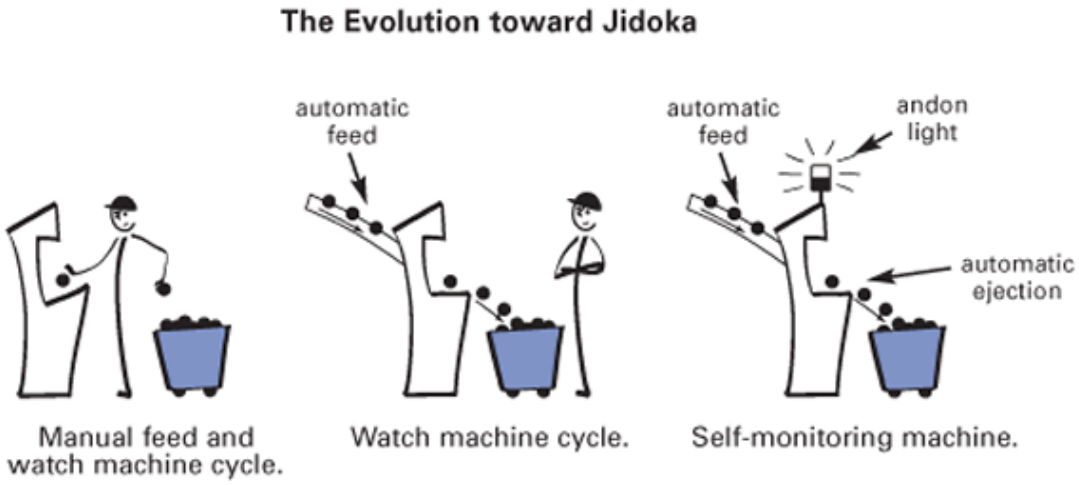


When to stop the line:

- Quality issues - If quality issues are not corrected at the source, waste only increases as time passes
- Process issues - Process breakdowns and failures occur if they are not addressed in a timely manner
- Material and supply issues - This can lead to significant downtime waiting on materials before restarting the process

Evolution towards Jidoka

Stage 1: Machines with manual feed and 100% of time with a human watching the feed
Stage 2: Machine with automated feed and 100% of time with human watching the feed
Stage 3: Machine with automated feed that watches itself and alerts the human only if there is a problem



Benefits of Jidoka:

1. Helps to detect problems earlier
2. Helps avoid the spread of bad practices
3. A level of human intelligence is spread into the automated process
4. No defective products are produced
5. Tremendous improvement in productivity