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LEAN THOUGHTS

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Kanban's Everywhere !

It is generally accepted that the word Kanban translates to 'visual trigger' or 'visual signal'. Given that the supply of goods or services needs to be planned and controlled through the value chain, it is not surprising that there are many examples of 'triggers' and 'signals'. Even computerized material planning systems will have examples of kanbans – a stack of printed work orders on a supervisor's desk should trigger some sort of action!

In designing improved systems for our factories and supply chains, it is useful to review the various forms of kanbans – kanban cards, labeled containers, designated floor areas or even lines on a wall next to a storage area. Often kanbans are used to trigger starting work and pulling product to meet demand. In some cases they also stop production and control the flow of work – for example when a storage area is full or when the specified maximum is reached.

Let's consider a common example – a kanban card placed next to a shelf, rack or bin for a given component. In this example, a card is needed because the point of supply is some distance from the point of storage/consumption otherwise the bin could be topped-up locally without the need for a card. This simple control system has at least two kanbans involving the same kanban card – one to trigger the request for more components and one to trigger the start of manufacture. In the first instance comparing the minimum quantity (stated on the kanban card) with the physical quantity *triggers* the card to be moved to the supply department. In the second instance, at the point of manufacture, the rack or file of kanban cards is the *signal* to make more components. The cards control the quantities and the timing of manufacture and, for visual control, should be placed in a rack or on a planning board.

Now consider some continuous improvement:

If we need to avoid component shortages, supply should be triggered when a minimum stock level is reached - but this could require a stores person to count the number of components to see if there are less than the required minimum. Solution? Use two storage locations (shelves, racks, bins or pallets) and trigger supply when the location is empty i.e. use a two-bin system. There would be a kanban card associated with each bin stating the bin quantity. (In the language of stock control, this quantity is both the 'batch quantity' and the 're-order point'.) To avoid shortages the bin quantities must at least equal the expected usage during the supply lead time.

The next enhancement is to consider using bins or containers themselves as the kanbans and dispense with the cards. Each bin would be labeled with component identification information and the bin quantity. A stack of bins, at the supply points represent the queue of work – a clear visual trigger.

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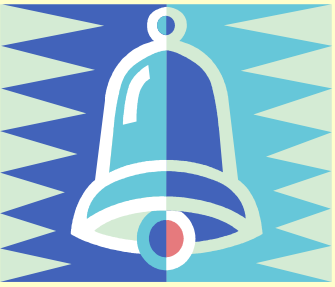
Where "Lean Thoughts" Become Reality



For high-usage environments, such as in the automotive industry (or when lead times are long or complex) a two-bin system becomes inappropriate – the bin quantities are too large and too much working capital is required to finance the stock and work in progress. Using multiple containers per component is one solution – choose a container size for ease of transport and storage and then calculate the number of containers needed based upon lead-time-usage plus any safety stock.

More improvements? When using multiple containers it helps to identify the containers either by numbering them sequentially (per component) or by assigning a specific reference. This facilitates auditing the system ('Have we lost any containers?') or increasing and decreasing the number of containers per component as demand changes.

Now consider the overall supply chain and the need for electronic information flow between customers and suppliers. Kanban/container reference numbers make it easy for electronic data collection and tracking – in this context kanban numbers could replace work orders, purchase orders, stock locations and lot-tracking references in your computer ERP systems.

Kanbans are everywhere!

Poka-Yoke Applied to Manufacture

Poka-yoke devices prevent components being processed incorrectly, or allowing faulty components to move to the next operation. They ensure that any defect is identified immediately, before further value is added and that only defect free components pass to the customer. Poka-yoke devices should be simple, not require maintenance, wear or fail, and should be incapable of being removed or deactivated. All too often, bad Poka-yoke devices can become very complicated and can be over-ridden.

There are three types of Poka-yoke device:-

Contact - where the shape, dimensions or other properties of the component, such as holes, prevent the components from being located incorrectly in an assembly or a tool.
Fixed Value / Constant Number – where a system is programmed to ensure that a specific number of actions are undertaken to complete a task – filling in a form on the internet usually requires that every box is completed otherwise an error message is given. Egg boxes and milk crates only allow a specific number of parts to be packed in one container.
Motion Step / Sequence – ensures that a correct number of steps are taken in a sequence. Checklists (before an aeroplane flight) or light beams to ensure that parts are picked from boxes in the correct sequence are examples.

Typical Examples of Manufacturing Poka-Yoke Devices

Below are some examples of the application and types of Poka-Yoke devices: -

- Sensors to prevent assemblies moving to the next operation until all parts have been installed.
- Bar codes fitted to each component and which are scanned after the operation has taken place.
- Locations cast, forged or moulded in position.
- Light beams which need to be broken to ensure that parts have been fitted.
- Auto stop devices which will not allow further operations to take place until action has been taken.
- Proximity sensors.
- Painting components when they are identical in every respect except for the material spec..
- Counters to ensure tools are not used longer than their economical life.

Specifying Poka-Yoke Devices

The ideal time to specify a mistake proofing device is at the design stage of the component or process.
The areas to target are where one mistake can be very costly, or where a large number of simple errors could be made.
After a Poka-yoke device has been installed and operated for some time it should be audited to make sure that it has resolved the potential error.
Poka-Yoke devices are often installed after a problem has been identified – ideally they should be specified before the design or process is put in to production.
Source – Metalworking Profuction

Contact me if you need coaching or facilitation help in the areas such as but not limited to; 5S, Value Stream Mapping, Set-up Reduction, Problem Solving or Policy Deployment and Consortium Development

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2008 Consortium Event Schedule

T our W orkshop C onference

January	February	March	April	May	June
T **Wednesday 16** Eaton Electrical, contact Joe Fisher, JoeRFisher@eaton.com	T **Wednesday 13,** ACE Bakery, contact Cindy Grolleman, cgrolleman@acebakery.com	T **Wednesday 19,** Nestle Waters, contact Mariela Castano mcastano@perriergroup.com	T **Wednesday 16,** CTS Corp., contact Bob Garces, Bob.Garces@ac.ctscorp.com **Consortium Shareshowcase** **Saturday 05** Eaton Milton. Contact Cindy Grolleman cgrolleman@acebakery.com or Joe Fisher JoeRFisher@eaton.com	T **Wednesday 14,** Stackpole CSD, contact Don Barber Don.Barber@stackpole.ca	T **Wednesday 18,** Morrison LaMothe, contact Tony Vita tvita@morrisonlamthe.com
July	**August**	**September**	**October**	**November**	**December**
		T **Wednesday 24,** Kraft Foods, contact Hanif Jivraj hjivraj@Kraft.com	T **Wednesday 08,** CGL Manufacturing contact Dave Deskur daved@cglmfg.com	T **Wednesday 12,** Messier-Dowty, contact Mike Smith Mike.Smith@Messier-dowty.on.ca	T **Wednesday 10,** Orenda, contact Brenda McIntosh brendamcintosh@orenda.com