

Processing of Insurance Returns

An EMC Lean Six Sigma Project

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EMC Corporation is the world leader in systems, software, services, and solutions for building and managing intelligent, flexible, and secure information infrastructures. We help our customers maximize the value of their information assets by implementing and accelerating powerful information lifecycle management (ILM) strategies.

This article is an illustration of Lean Six Sigma principles applied successfully to an operational issue involving inventory of damaged products that may have an insurance claim.

DEFINE

The insurance returns process at EMC addresses EMC storage systems that are suspected of being damaged in-transit, either outbound from or inbound to the factory. Given the standard corporate contract terms, EMC normally takes liability for product in-transit and if any suspicion of damage occurs during this period EMC opens an insurance claim with our insurance broker. The liability for damage is held between the freight forwarder and EMC. A third party such as an airline may also be involved. A suspect product is returned to the factory and assessed for damages by EMC's engineering team and in some cases, the material may require special systems retest for the assessment to be completed. Suspicion on product damage can result from many things including damaged packaging and 'tip & tell' indicators, to more serious visible product damage arising from mishandling.

Insurance return inventory typically represents five percent of the factory's ending inventory forecast and is a significant financial holding. Floor space and capital tied up in this category of inventory constrain the factory from positioning 'good' available inventory in finished goods to meet unplanned customer demand.

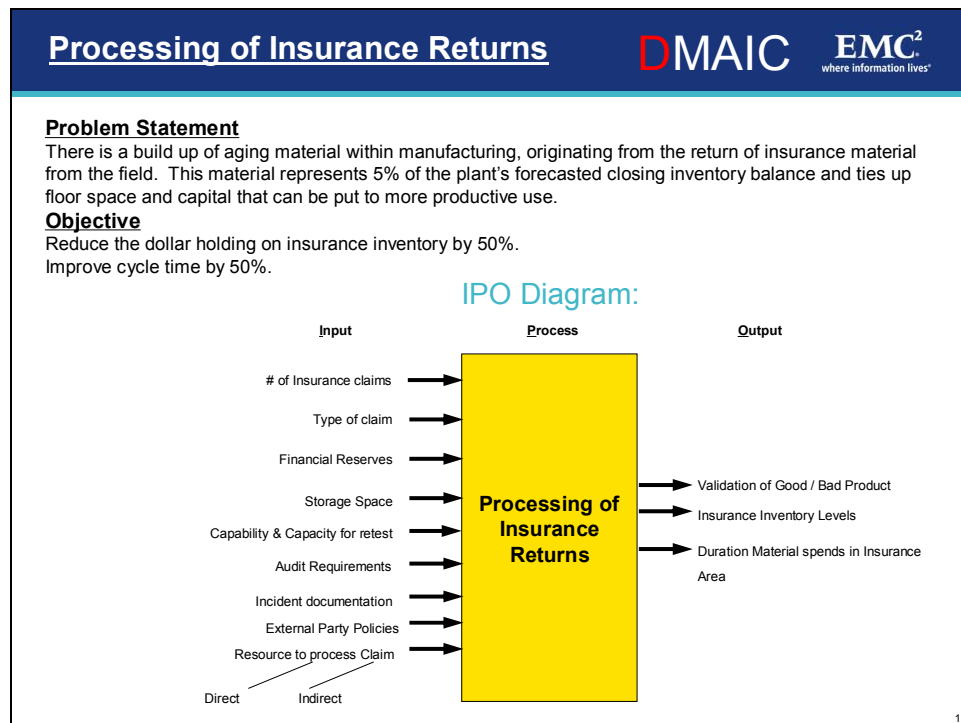
A noticeable build up in field return inventory first led us to look at the insurance returns process at EMC. Recognizing inventory accumulation as one of the seven wastes of Lean, we formed a cross functional team, led by a green belt, to try to eliminate this waste at one of our plants. The primary goal of this Lean Six Sigma project was to review and understand the existing insurance returns process at a single manufacturing plant and the extent of variation within the process.

The objective of the project was to reduce the dollar holding on insurance inventory by 50%. A secondary measure was to improve the cycle time it takes to process the material.

The team embarked on the define phase of the project by first completing an IPO diagram, which indicated insurance inventory levels and time spent in the insurance

area were the key outputs. The key inputs were the number of insurance claims, types of claims, capacity for re-test, and storage space, among others. The detailed IPO is listed below for reference.

Since many contributors to the process had visibility only to their own input and lacked an understanding of inputs from other functions, the IPO diagram was a useful tool in clarifying the input factors across the entire cross-functional process. The team then performed a stakeholder analysis, identifying key stakeholders and their level of readiness to change the process.



MEASURE

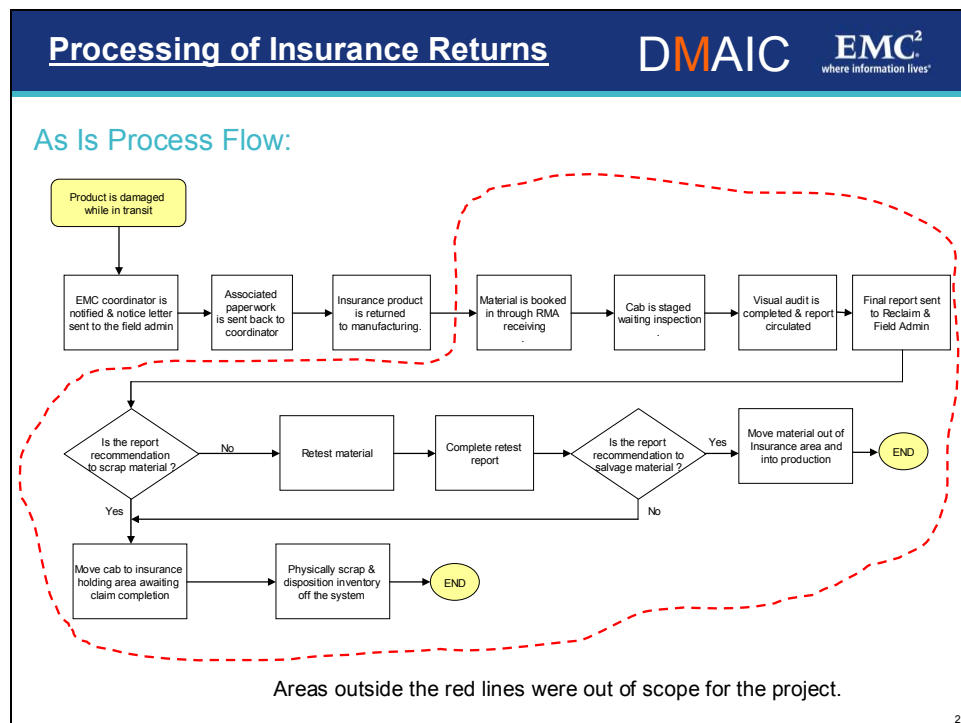
The first step in the Measure phase was to develop the current state process flow which helped define the boundaries of what we were trying to improve. While constructing the process flow, it became clear there were elements of the process outside of manufacturing control, highlighted outside the red line in the process flow. To facilitate progress of this project, we decided to treat these elements as out of scope for this project.

The tools utilized up to this point in the project helped refine understanding, scope and objectives of the initiative. However, at the measure phase it was also necessary to gather some baseline quantifiable data around our primary and secondary metrics.

We found that over the previous twelve month period the levels of insurance claim inventory being held by the factory was consistently high. Throughput was evident in this inventory pile, as the annual figures for insurance claims were much higher than the residual inventory in the factory.

The team then looked at the secondary measure - the cycle time of insurance claims. Baseline average cycle time was 330 days, with a standard deviation of 165 days, as compared to an upper spec limit of 90 days. In fact, 75% of the insurance inventory exceeded the 90-day goal for cycle time. The data also showed that our insurance inventory was linked to 24 specific top level assembly units (TLAs), which in turn are the centre of each individual insurance claim.

At the conclusion of the Measure phase, the team had not only a clear understanding of how the process worked, its dependencies across multiple groups and the stakeholders within these groups, but also a vivid quantifiable picture of how poorly the process was performing and how much improvement would be necessary.



ANALYZE

The first stage of the Analyze phase was to revisit the process flow with a view to identifying all forms of waste in the process. From the data in the measure phase, it was obvious that there was wide variation, contributing to the poor performance of the process. We now sought to identify the causes for this variation. To carry out the analysis effectively the team focused on a few specific insurance claims, tracking them through the process steps and observing their cycle times through each step. We also noted inventory levels at each step and the catalysts that prompted movement from one step to the next.

As visible in the process flow, waiting time was evident throughout the process with insurance inventory often sitting idle, waiting to move to the next step in the process. This occurred when ownership for input to the process crossed functional or departmental boundaries and that each possible delay introduced greater opportunity for variation in the cycle time of claims.

At this juncture a new aspect to the process became apparent to the team. While we set out to address the physical buildup of inventory and documented the physical transition of product through testing and inspection, equally important was the associated administrative or office based process.

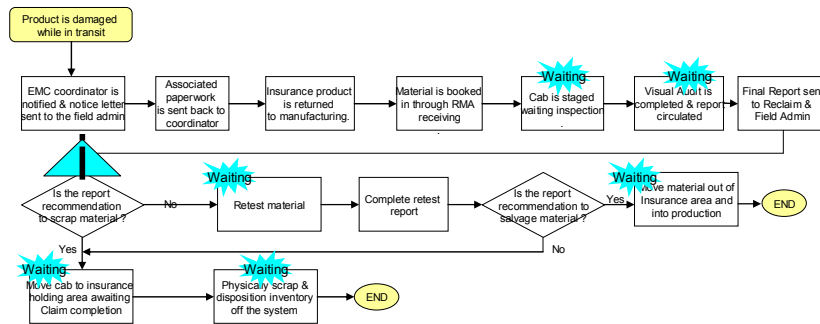
The information management required to effectively support the physical movement of inventory was virtually non-existent. Consequently, when taking the concept of FLOW into account, this process, from a physical movement or information movement perspective, was not fluid and resulted in sub-optimal performance.

Having recognized this deficiency, the team now tried to identify cause and effect for the prolonged cycle times on insurance claims by using a fish-bone diagram. The team found multiple variables impacting each step in the process. The team decided that the success of this project would center on narrowing our focus to address one specific area (or bottleneck) or a critical path through which a high percentage of the claims flowed. Of particular interest were issues relating to lack of communication regarding dispositions and batch processing of audits. To help us in this endeavor we performed a simple Pareto analysis on the type of claims we saw for the previous twelve months. The results showed us that 73 percent of all claims processed went through one particular routing and it was the improvement of this routing that we choose to base our efforts on going forward.

The Analyze stage helped us identify areas of the process on which to focus our improvements. The following observations were made:

- The main sources of waste in the process are inventory and waiting, with waiting evident in almost every step.
- Through C&E diagram, it is apparent that communication and information flow is extremely poor in the process.
- Ultimate ownership within the process is an issue.
- Service level agreements and standard operating procedures are not in evidence, for even the most basic or fundamental steps in the cycle.
- The process flow is being impacted by batch processing of audits and scrapping.
- Using a Pareto of previous claims, a high percent of claims are dispositioned to be scrapped after initial engineering visual inspection. Therefore efforts to optimise this area would have significant benefits in terms of the overall process performance.

- Analysis shows that the waste of **waiting** was almost everywhere in the process
- Where ever waiting occurs, more opportunity for variability creeps into the process.
- The information flow to support the physical flow seems to be non-existent.



IMPROVE

The charter for the improve phase was defined based on the outcome from the Analyse phase, including:

- Focus on the scrap routing where 73% of claims go.
- Improve communication within the internal cycle to facilitate a better physical flow and reduce waiting.
- Avoid batch processing anywhere in the process.
- Streamline hand-offs and clearly identify ownership throughout process.
- Review or create service level agreements within each stage of the process.
- Review the insurance assessor's requirement to physically keep inventory onsite following any audit recommendation to scrap.

Addressing the corrections to the information and process flow, we deployed a swim lane approach to the process flow, clearly denoting where hand-offs occurred in the process, both for information and physical product. This also enabled us to clearly address the matter of ownership, as every stakeholder could now see the importance of their input to the overall success of the process.

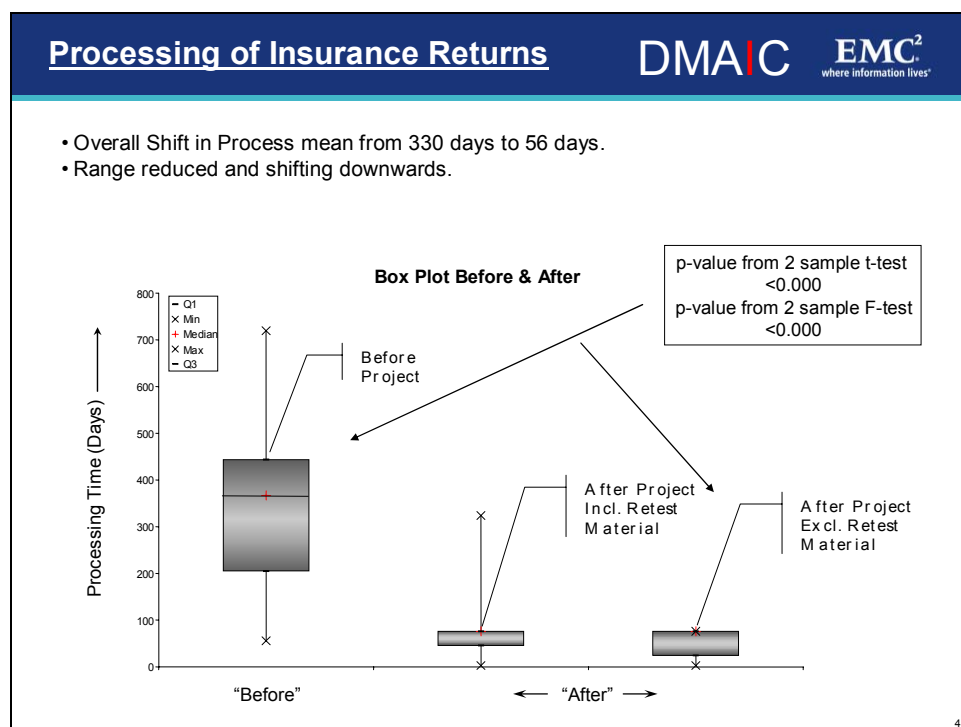
For most variable input, basic service level agreements were put in place to drive a performance standard. For example, the initial inspection on claims was expected to be completed and written up within fourteen days of receipt of goods. Metrics on all the key gateways were also developed to ensure ongoing maintenance of standards.

Elements of the Lean principles were also introduced at this stage with the removal of the batching of work in this process and an emphasis placed on one-piece flow. Among other things, testing and inspection had been handled in a batch manner but

it was now agreed that each claim would be processed individually thus ensuring minimal delays, enhanced flow and constant throughput.

The final element we needed to address for the routing was to optimize the requirement on us as a factory to hold inspected inventory on our books awaiting closure of the claim. At this point in the process, we would have completed all required evaluations on the product and had decisive recommendations on the next course of action for the material, however nothing was done with product until the insurance claim was completed.

After discussing with the insurance assessors they concurred that there was no real value-add in us holding material indefinitely and that given a thirty day notice of our intent the assessor was agreeable to let us process the material onwards with the appropriate documentation. This meant that while the insurance claim could go on for months, the inventory associated with it, once inspected and tested, could be dispositioned without much delay (i.e. held for 30 days post inspection). While this change in the process and some of the other general ownership and information flow improvements benefited this focused routing specifically, it also would be complementary to many of the other routings the remaining 27 percent of insurance claims would go through.



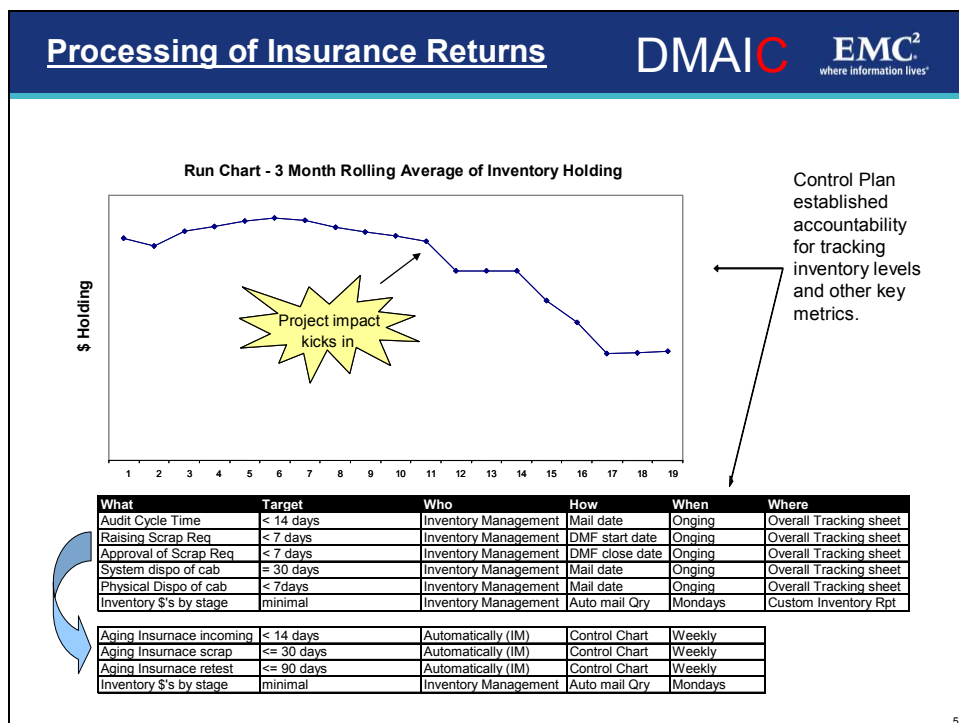
CONTROL

Once the improvements were implemented the positive impact became very visible in the primary and secondary metrics. Inventory holding was reduced by almost 55% from levels before the project started.

For the secondary metric we used some box plots to illustrate the change in the process. Three box plots are presented, the first being the baseline data, the second shows the improved process with all claims considered and the third shows the improved process with only claims that followed the routing we choose to improve. Overall there was a shift in the process mean from 330 days to 56 days and the range was reduced and shifted downwards. P values from two sample t tests and F tests for before and after data indicated that both the mean and standard deviation had shifted 'significantly'.

The initial control plan is largely based around a monthly meeting chaired by the inventory management group. This group will also maintain a tracking sheet of all the current insurance claims, detailing the cycle time of each process step and the inventory holding in each. An automatic report has been set up from the manufacturing system to gather this information, so as to avoid creating any extra work and reduce manual dependencies in the improved process. In the mid to long term, the monthly meeting remains in place to facilitate rotation of personnel, general health check on the process, any new developments and customer satisfaction. Once confidence is built in the process control, we are looking to deploy control charts to track the performance of the main steps.

The results of this project were aptly summarized by Bill O'Connell, Director of International Supply Chain at EMC, who said, "The gains made in this project by freeing up monies from non-value adding inventory, will really service the business well in terms of customer experience and in providing flexibility. This project really proves the power and value in applying the basics of Lean Six Sigma, specifically tools such as process mapping, cause and effect analysis and standard operating procedures."



About the Author

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Aidan Trindle has over 12 years experience in Materials Management & Supply Chain. Currently an International Logistics Manager with EMC, Aidan is also a Lean Champion and a Certified Green Belt.