Lean Test Management

Ban Waste, Gain Efficiency

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Professional Testing®
I will show you differently!

CAROL, SCHEDULE A STAFF MEETING.
WHAT’S THE TOPIC?

I PLAN TO FUSE SIX SIGMA WITH LEAN METHODS AND TEST MANAGEMENT TO ELIMINATE THE GAP BETWEEN OUR STRATEGY AND OUR OBJECTIVES.

I’LL JUST SAY “WASTE OF TIME.”
Agenda

- Lean Manufacturing
- Lean Six Sigma
- Roadmap to Lean Test Management
- Conclusions
What is Lean Manufacturing?

• Lean manufacturing is a company process improvement method. It is developed from a logistics viewpoint.

• Lean manufacturing concentrates on banning waste to become quicker and more efficient. Every process that does not add value for the customer is eliminated.
Lean Manufacturing - the 7 wastes

- Overproduction
- Waiting
- Transporting
- Inappropriate processing
- Unnecessary inventory
- Unnecessary / excess motion
- Defects
What is (Lean) Six Sigma

- Lean Six Sigma is a quality management method that offers a framework to manage quality. By many it is seen as a sequence of Total Quality Management (TQM) with a high use of Statistical Process Control (SPC) as underlying method. Processes can be controlled when you know how each process goes and to know that you have to measure: to measure is to know! Measuring is the basis of Six Sigma.

- The aim is to work smarter and get a higher quality.

- Sigma (δ) is the standard deviation from the average. A statistical term that measures how far a given process deviates from perfection.
Six Sigma is founded at Motorola in the mid 80’s as a solution for problems with product quality and customer satisfaction. Six Sigma got its big popularity when it was used on a broad scale at General Electric and gained billions over a period of multiple years.
Defects with sigma level 2

2 σ = 69.1% defects

30.9% defects

-3 σ -2 σ -1 σ 0=target 1 σ 2 σ 3 σ

MAX
Defects with sigma level 4

\[ 4 \sigma = 99.4\% \]

\[ 0.6\% \text{ defects} \]
4 key elements

- Delight the customer
- Improve processes
- Teamwork
- Data and facts
Roadmap to Lean Test Management

- DMAIC:
  - Define
  - Measure
  - Analyze
  - Improve
  - Control

- Between every step is a tollgate
• Purpose:
  To agree on what the project is.

• Example tools:
  – SIPOC
  – Value Stream Map
Define - Example SIPOC

* Critical-To-Quality indicators (CTQ)
Define - Example Value Stream Map

- Test Manager
  - 1 hour

- Test Analyst
  - 10 days
  - Design test cases
  - 1 day

- Test Engineer
  - 5 days

- Design test data
  - 0.5 days

- Execute test cases
  - 0.5 days
  - Test Analyst
  - 5 days
  - Test Executor
  - 14 days

- Configure test environment

ETC
• **Definition Takt Time:**
The desired time between units of production output, synchronized to customer demand.

• The concept carries backward through a process stream. Ideally, every step synchronizes with the final output. Takt Time is fundamental to Lean Manufacturing.
Takt time - a bomber an hour
Measure - Theory

- **Purpose:** Evaluate the existing measurement system, observe the process, gather data, and map the process in more depth.

- **Example tool:**
  - Pareto chart
## Measure - Example Pareto Chart

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failures in test environment</td>
<td>65</td>
</tr>
<tr>
<td>Failures in test data</td>
<td>20</td>
</tr>
<tr>
<td>Failures in test cases</td>
<td>8</td>
</tr>
<tr>
<td>Not fully capable resources</td>
<td>5</td>
</tr>
<tr>
<td>Rest</td>
<td>2</td>
</tr>
</tbody>
</table>

Total: 100

Pareto chart for long waiting hours during test execution
Purpose:
Use collected data to confirm the source of delays, waste, and poor quality.

Example tools:
- 5 Why’s
- Ishikawa diagram
Analyze - Example 5 Why’s

Problem Statement:
During test execution there are long waiting hours.

1. Why are there long waiting hours during test execution?
2. Why are there failures in the test environment?
3. Why do we often have the wrong version?
4. Why does someone install the wrong version?
5. Why don’t we have proper version control?

1. Because often there are failures in the test environment.
2. Because we often seem to have the wrong version of the test object.
3. Because someone installed the wrong version.
4. Because we don’t have proper version control.
5. Because we never got around to it, but it seems time to do it now.
Analyze - Example Ishikawa Diagram

- Failures in test environment
  - Wrong configuration
  - Bad version control
  - Corrupt database

- Failures in test data
  - Corrupt database
  - Old test data

- Failures in test cases
  - Unclear requirements
  - Unclear FO
  - Error in use test technique

- Not fully capable resources
  - Unclear expectations
  - Not properly trained
  - No one else available

Long waiting hours during test execution
Purpose:
To make changes in a process that eliminate defects, waste, cost, etc., which are linked to the customer need identified in the Define phase.

Example tool:
- Pick chart
Improve - Example Pick Chart

Easy to implement

Large result

Implement
1
7
9
5

Possible
6

Small result

Hard to implement

Challenge
4
8

Kill
2

3
• **Purpose:**
  To make sure that any gains a team makes last.

• **Example tool:**
  – Control chart
Control - Example Control Chart

<table>
<thead>
<tr>
<th>Gain</th>
<th>Sigma</th>
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</thead>
<tbody>
<tr>
<td>30.85%</td>
<td>1</td>
</tr>
<tr>
<td>69.15%</td>
<td>2</td>
</tr>
<tr>
<td>93.32%</td>
<td>3</td>
</tr>
<tr>
<td>99.38%</td>
<td>4</td>
</tr>
<tr>
<td>99.977%</td>
<td>5</td>
</tr>
<tr>
<td>99.99966%</td>
<td>6</td>
</tr>
</tbody>
</table>

Pre LTM | Post LTM | Control LTM

Upper limit
Average
Lower limit
Triggers for actions

Unpredictable proces | Improved proces | Controlled proces

T1 | T2 | T3
Conclusions

• Test Management can benefit from Lean and Six Sigma

• Improvement from within your company

• Useful addition to “standard” Test Process Improvement models

• Better integration of test process with other processes