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CASE STUDY | TNT Express - Use Innovation Tools to Make Transactional Lean Improvements

Inside disciplined DMAIC projects, innovation tools can help teams find better solutions.

Value stream or other Lean analysis helps identify the main obstacles to flow in a process. Improvement projects using Lean tools in a transactional environment (i.e., office) are often confronted with the following problem: Lean teams lack a methodology to consistently problem-solve how to remove obstacles from a value stream. Especially for the transactional arena, teaching and coaching teams to employ innovation tools can be constructive.

Challenges in the transactional environment

During the past 30 years, Lean and Six Sigma methods have been refined, first for manufacturing and then for transactional environments. The challenges for the latter are many, which is why major training houses offer specialized “transactional Lean” or “transactional Design for Six Sigma” classes.

Most often, a production environment is characterized by abundant data on product or production processes. However, far fewer data are typically recorded in the office. These are mostly time stamps or of a categorical nature (e.g., worker A, B or C). Office processes can also be discontinuous—think of compiling a monthly report—and expose multitasking workers to internal policy and external regulatory compliance requirements. Especially in an office environment of a low maturity level, people can become so involved in the complexity of individual tasks that they don’t perceive the flow of the underlying process. In such instances, what is otherwise called the “hidden factory” may turn out to be the very value people think they add by spotting, dealing with, and finally correcting a large variety of different types of errors.

TNT Express is a major logistics service provider. To deliver shipments fast and consistently at one of the company’s major airport hubs, an improvement team focused on reducing the time it takes from check-in of freight to shipment readiness. This process also involves dealing with paperwork: checking consistency between physical pieces and documents, customs clearance, and data entry so that both customer and company can track shipments. Opportunities

for errors are numerous in this process. When these occur, consequences can be grave, particularly when shipment-readiness is erroneously given for freight that must be checked by customs officers before shipping can proceed. The process is also characterized by a high interaction among office workers as well as the depot where physical shipments are handled.

In that context, innovation tools such as those compiled in *The Innovator’s Toolkit* (Wiley, 2008) by David Silverstein, Philip Samuel, and Neil DeCarlo help teams overcome the hurdles more consistently.

Teach people to see their process

The TNT Express project focused on a process that had withstood several attempts at improvement during the past few years. A review of project records showed that these attempts focused on the performance of individual process steps rather than on improving consistently the end-to-end process performance.

To increase the chances of success, the team decided to follow the Define, Measure, Analyze, Improve and Control (DMAIC) methodology. They found the measure phase labor-intensive, particularly as the team worked to create a process map based on observation and interviews. When watching people perform operations in front of computer screens, the team saw them skillfully navigate between various databases, the Internet, Excel files, and other documents. However, because the team didn’t have the specific process knowledge of the area, team members weren’t able to understand the tasks these people were actually performing.

For example, during interviews they learned people needed to open database A to find the number of pieces as per scan results from the check-in procedure. Workers then went to database B and checked the number of pieces listed there. When the two didn’t match, a search was performed in database C or, depending on the type of shipment, in an Internet application. Only after persistent questioning did the team understand that these tasks belonged together to form the process step of “checking the consistency



SUMMARY

Industry

Logistics

Business Problem

Speed up the time for international shipments through customs

Methodology

Customized learning program configuration

Solution

- Challenge the very setup in which the problem occurs
- Establish a compliant customs procedure for incomplete shipment units

Benefits/Results

Reduction in average lead time through customs from 14 hours down to 7 hours. Critical connections are not missed, and one person is freed up for more valuable tasks than “searching the network.”

Key Tools Used

- ▶▶ Process and value stream mapping
- ▶▶ Voice of the customer
- ▶▶ Creative challenge
- ▶▶ Standardization

Who is TNT Express?

TNT Express, one of the world’s largest express delivery companies, ensures that parcels, documents and freight items are delivered safely and on time throughout the world.

TNT provides a wide range of time definite and day definite express delivery services in over 200 countries.

Market capitalization: €5 billion.

between physical presence of pieces and what is reported in the corresponding (and often electronic) documents.” After half a day of interviewing, and drawing and redrawing process maps, the team ended up with the process map as shown in Figure 1. All who had contributed agreed this was the process underlying the tasks being performed, but none had actually seen it this way before. In fact, people had just “learned to see” the process they were all working in.

the start-and-stop time stamps for each shipment. When the results from this study were published, surprise and even shock set in: Although completing each process step takes minutes, the start-to-end process lead time is as long as a few hours and, in extreme cases, can take up to a day or longer.

From a value-stream analysis and based on the time-stamp data, the following improvement potentials became obvious:

solutions are born out of radically new, Lean inventions. In a transactional environment, however, the solution space often is further restricted by policy constraints to the process, which may be harder to solve than “just” coming up with a bright technical solution.

Inventing radically new solutions in the presence of perceived constraints is a key challenge of innovation. Tools and methodologies similar to those used for Lean or Six Sigma problem solving are necessary.

TNT Express teaches some of these tools in its Lean training and emphasizes their use to solve Lean problems, especially those encountered in a transactional environment. “We recognize that transactional processes need a breadth of tools to tackle long-standing problems,” says Andrew Lofts, senior manager for quality and process excellence at TNT Express. “We have developed our Lean methodology to incorporate tools from Lean service concepts, Lean and Six Sigma. Through this unique approach we encourage our people to apply their creativity toward solving these very difficult problems. We therefore see traditional Lean tools sitting very comfortably and used together with the tools from the innovation side of process improvement.”

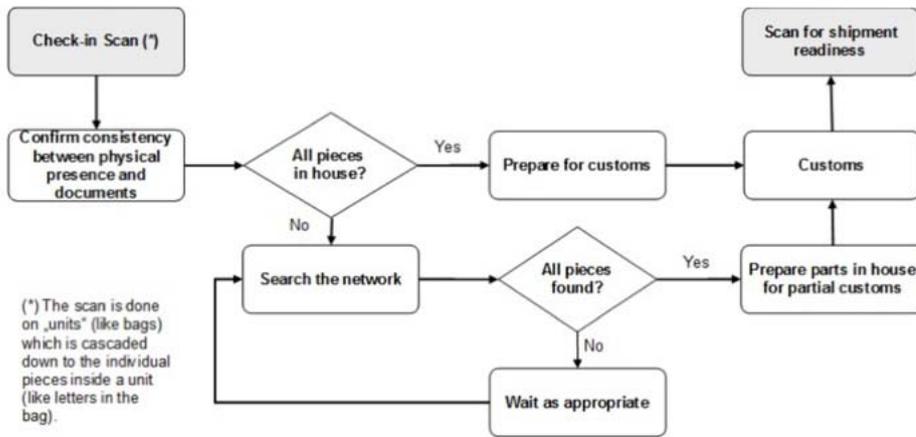


Figure 1: Process flow in the office

Team members were also impressed by the responsibility being handled in the office process. “We thought these people were just working slowly,” one team member noted. “Now we understand why some shipments can sit around for such a long time, and we need to segregate them out.”

Collect and analyze data

In the next step, the team members collected data to better understand the mechanics of the process. They prepared simple sheets, one line for each shipment ID, and collected the time stamps for the starting and ending of the process steps “confirm consistency,” “prepare for customs,” “search the network,” and “prepare for partial customs.” Also, employees were asked to record the results of their decisions, e.g., whether all pieces were in house or at least traceable in the network. Because employees worked on different process steps, for one given shipment ID they saw only their own performance (e.g., how fast they could search for missing pieces of a shipment). However, they couldn’t see the waiting times between the different steps or the start- and end-time stamps of the entire process; the end-to-end process performance wasn’t visible. As a result, employees had long lists of shipment IDs for which they collected time stamps for isolated tasks.

This was revealed when the improvement team, using shipment IDs, threaded together the tracking sheets from all workers and

- For a given shipment, align the process steps currently executed in disconnected “process islands” so that one step is performed right after the next. Ideally, implement “single piece flow”
- Speed up the handing over to and from customs (an external party) so there is also no waiting
- Eliminate the “wait as appropriate/ search the network” loop

Transactional Lean problems may be innovation challenges

Although it greatly helped workers to see their own process and understand the detrimental effect on lead time of setting up the process in disconnected process-islands, the seemingly insurmountable obstacle remained in the “wait as appropriate/search the network” loop. Because customers are not paying for that loop, it cannot be considered as “value adding.” However, specialists confirmed this loop needed to be there to satisfy legal requirements and therefore classified it as “business value added” rather than as “waste.”

Lean teams struggle with the distinction between business value added and waste, especially in transactional environments. Only a few tools are available in a traditional Lean toolbox to help teams invent solutions to remove waste that’s considered necessary. During the improve phase of manufacturing, Lean innovations are often made. Single-minute-exchange-of-die or mistake-proofing



ABOUT BMGI

BMGI enables companies throughout the world to identify and solve their most important business problems, with a strong emphasis on sustainable results. During its long history, BMGI has developed solutions for a broad spectrum of businesses across many industries, driving the success of process-improvement, design and innovation initiatives. Just a few of BMGI’s clients are General Dynamics, TNT Express, Avis Budget Group, China Chemical, Graphic Packaging, Siemens, Hitachi and Philips Electronics. For more information, please visit the BMGI website at www.bmgi.com

Visualize the constraints and remove them with innovation tools

To apply these tools, the team brought in people from different areas, process experience, and hierarchical levels, and gathered them for a carefully prepared meeting. The Lean findings and analysis was presented first. The team leader then took the value-adding process steps (i.e., scan—customs—scan) and placed them on a flip chart: “This is the ideal process,” she said. “Now, what are the constraints to implement it?”

After wild debate, the team agreed that all points raised could be summarized in five constraints. The team leader then drew a pentagon on a flip chart, each side labeled with one of the constraints, saying, “The solution we are now looking for is somewhere inside this pentagon. It may not be the best solution, but it will be what is possible with all the constraints we have identified. The best solution, however, may be somewhere outside the pentagon.” She then drew light bulbs inside and outside the pentagon to symbolize these two solutions. She also asked team members to identify which of the constraints were under their own location’s influence, under the company’s influence, or under external influence. Figure 2 is a sketch of the result.

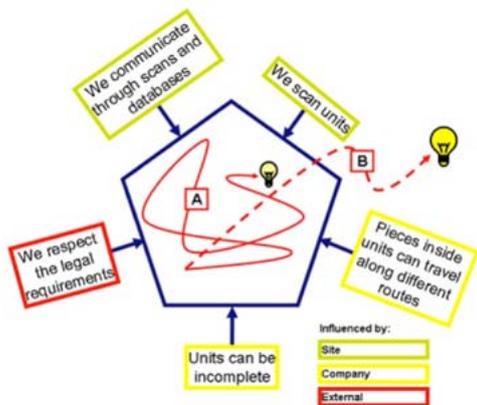


Figure 2: The solution space together with the constraints

Creatively challenge constraints to find the solution

One of the tools teams use to find radically new solutions is the “creative challenge” where all assumptions of current thinking are systematically questioned. To facilitate that process, the team was asked to envision the resulting process if one or several constraints could miraculously be removed.

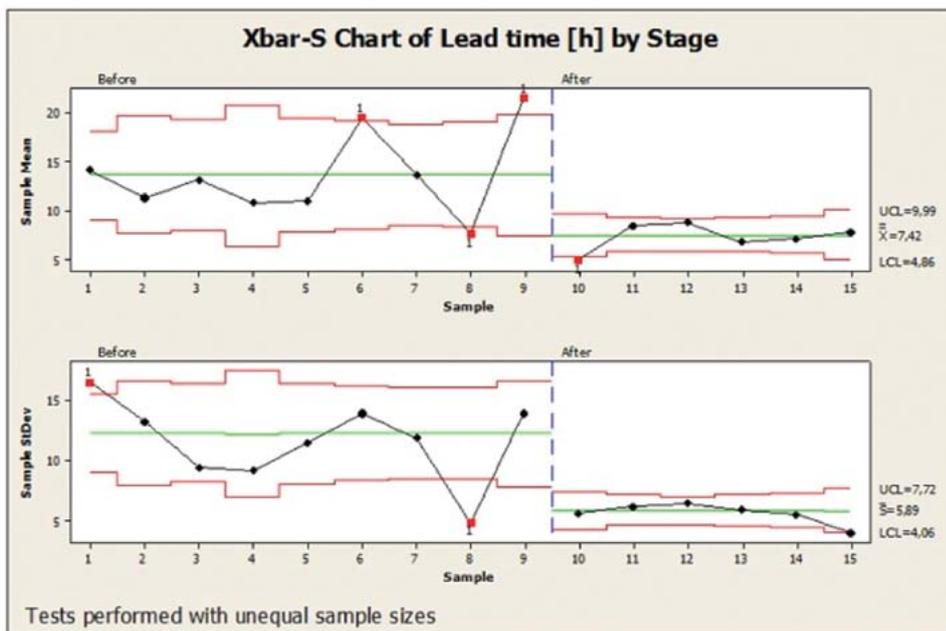


Figure 3: Control chart of the process lead time for nine weeks before and six weeks after the intervention

When the team went one by one through the constraints in this way, it also looked into the legal requirements. Without those, there would be no need for “search loops.” In fact, whatever was in house could then be prepared immediately for customs. A discussion ensued about the issue that, by law, customs will not handle partial shipments where documents display a larger number of nonlocated pieces. Following detailed discussions and analysis of the legal documents relating to this issue, team members decided that the solution would be to satisfy all legal requirements while still dealing with partial shipments.

The new process the team developed during the next couple of hours turned out to be so simple that a person could be trained how to run it in 10 minutes. (See the control chart in Figure 3.) Average lead times were reduced considerably. Even more important was the benefit for the depot: An area of 80 square meters reserved for shipments waiting for release, which previously had to be searched multiple times during a day, was found to be simply not needed any more. Trial scans through this area to identify released shipments also became irrelevant. The team leader, who had been on vacation while the project was executed, was shocked on her return to observe the simplicity of the new process. Workers in the depot also commented on a dramatic relief in terms of workload. For all those involved in the project, this experience dramatically increased their confidence in the TNT Express “Sure We Can” motto. Solving Lean

problems often involves finding radically new solutions. Especially in a transactional environment, the challenges to do so are manifold.

The disciplined work in a DMAIC project, be it Lean or Six Sigma, is sometimes said to kill ideas and creativity. However, structure can be highly enabling when it allows teams to focus their creativity; it’s only limiting when applied too rigidly. Inside disciplined DMAIC projects, innovation tools can help teams find far better solutions than originally expected.

When confronted with unconventional problems, Lean practitioners should familiarize themselves with innovation tools and add them to their toolboxes. The creative challenge described here is only one out of many of these tools.

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