



HAL
open science

Lean Monitoring: Boosting KPIs Processing Through Lean

Bassel Kassem, Federica Costa, Alberto Portioli Staudacher

► **To cite this version:**

Bassel Kassem, Federica Costa, Alberto Portioli Staudacher. Lean Monitoring: Boosting KPIs Processing Through Lean. 7th European Lean Educator Conference (ELEC), Oct 2021, Trondheim, Norway. pp.319-325, 10.1007/978-3-030-92934-3_32 . hal-03771916

HAL Id: hal-03771916

<https://inria.hal.science/hal-03771916v1>

Submitted on 8 Sep 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License



This document is the original author manuscript of a paper submitted to an IFIP conference proceedings or other IFIP publication by Springer Nature. As such, there may be some differences in the official published version of the paper. Such differences, if any, are usually due to reformatting during preparation for publication or minor corrections made by the author(s) during final proofreading of the publication manuscript.

Lean Monitoring: Boosting KPIs processing through Lean

Bassel Kassem¹, Federica Costa¹, Alberto Portioli Staudacher¹

¹ Politecnico di Milano, Department of Management Engineering, Milano 20156, Italy

Abstract.

The wide diffusion of the Lean Thinking philosophy has led different industries to improvements by analyzing their processes and identifying KPIs to monitor their performance, resulting in more notable importance to the KPIs results than the generation process. Waste appears in different environments, and the KPI monitoring process is no exception. The Lean approach within this area boosts the monitoring process, providing real-time analysis, allowing a better response time in corrective actions. This paper exhibits a continuous improvement project that successfully led to a significant reduction in KPI generation processing time. It relies on introducing a KPI dashboard, a digital tool for lean production.

Keywords: Lean, KPI dashboard, Continuous improvement

1 Introduction

The levels of globalization established in the modern area have set new rules for the business world. Dynamism and competitiveness of the current environment have driven customers' needs for accuracy and quality in the continuously growing service sector [1], and not just in the manufacturing sector [2–5] leaving companies with small or no space for mistakes [6, 7].

Awareness of the status, feedbacks, and requirements of the customers represents a highly competitive advantage, as opposed to the older and traditionally seen scenario where problems are commonly identified in a later stage, resulting in limited and somewhat costly intervention options [8]. For this reason, after the undeniable success of Lean methodology in manufacturing and mass production activities [4, 9], the lean scope is spreading and reaching different industries and contexts [10–12]. Notwithstanding the astonishing benefits of lean, many firms struggle to integrate, harmonize and sustain lean principles within the different lines of the organization [13], resulting in a slow pace of lean growth, and an unexploited range of opportunities and benefits that lean at strategic levels can provide. [2, 14].

The purpose of this article is to illustrate how an Italian company's journey, through the application of a lean problem-solving methodology, could become closer to developing a just-in-time monitoring process. Through an empirical project, the applicability

of lean in the context of KPI monitoring activities through the A3 problem-solving methodology is represented, leading the company for just-in-time responses from the KPIs using the KPI dashboard and improving the relationship with the customers.

2 The company XYZ

XYZ is an Italian company with more than 70-years of leadership in the production of innovative solutions for the textile industry. As part of a multinational group, the company focuses on developing the sustainability of its processes and providing products with the lowest possible environmental impact, as well as additional services for customers. The seeking for innovation and sustainability leads to extensive research targeting a constant improvement on productivity and quality. Together with technological excellence, the company highly relies on an extensive network of local agents, and sales services to bring the best experience to the customers. The presented paper addresses a project carried out in the offices of the company; the headquarter is based in the north of Italy with more than 300 employees.

3 The case

Part of the business of the company is related to the sale of services linked to its products. A portion of these services requires a presence on customers' sites, called Field Services (FS). These services encompass not only the activities on the field but some back-office activities as well. In the last years, FS has been facing changes introducing SAP and CRM Salesforce to support the management. And recently, the company was required to move to Salesforce Lightning which is considered to start in the following months of the beginning of this project. The objective of the company is to provide high-quality products and services.

FS directly affects relationships with customers and consequently their overall experience with the company. Therefore, it is of primary importance the ability of the company to monitor its FS activities.

3.1 The problem

XYZ uses a traditional feedback and control cycle in the FS process. The problem perceived and under investigation has been a long time that is necessary to obtain the KPIs needed to monitor the Field Service Process. This is negatively impacting the possibility to maintain an updated overview of the current situation, making them losing control. The company is currently monitoring 6 KPIs; by shortening this time and the effort that is necessary to have the KPIs, it would be possible to increase the frequency of calculation that, currently, is once per quarter. The company, knowing that the

process of formulating the KPIs takes more than four days in LT and 16 days in total workload continues postponing the creation until few days before the end of the quarter. Each week has its urgent tasks, and this eventually leads to the postponement and therefore became the new norm. However, this causes delays in understanding the situation and therefore the ability to uncover underlined problems and issues as customers started complaining and showed their concerns regarding some delays in the service and other peculiarities that we opted to omit due to privacy reasons. Surely, even with the current situation, it was possible to increase the frequency of KPI process formulation, but the concern was to spend the same duration each time. Therefore, the company asked the help of the Lean Excellence center at Politecnico di Milano to streamline the process, reduce its duration, and therefore allow for the increase of frequency. Increasing the frequency of calculation would allow the company's management to design timely and, therefore, more effective corrective actions, in case of arising problems, resulting in better overall performances.

3.2 Current situation

For understanding the current situation, two different measures were considered: the lead time (LT) and the workload (WL). The LT represents the time necessary to obtain the KPIs from the top management's request to the moment when the report is delivered. The WL considers the man-hours dedicated to the activities related to KPIs' computation, during the whole quarter. Even if the LT and the WL are correlated, by monitoring both parameters it would be possible to better highlight the improvements to the company. The computation of the KPIs relates to three macro-activities: data storage, pre-computation, and actual computation. These activities allowed the calculation of the LT and WL. The results for the current situation were LT of 4.1 working days and WL value of 15.8 working days (1 working day equal to 8 hours).

3.3 Target Definition

The targets emerged from brainstorming sessions with the After-Sales department leading to a must-have goal of reducing the LT from 4.1 to 1.6 working days (60% reduction), and a reduction of WL from 15.8 to 9.5 working days (40% reduction). Additionally, a nice-to-have target is set as a reduction of LT from 4.1 to 0.8 working days (80% reduction), and a reduction of WL from 15.8 to 6.3 working days (60% reduction).

3.4 Root Cause Analysis

The Root Cause Analysis allowed understanding which was the main reasons that were triggering a long time to compute the KPIs of interest. The Ishikawa diagram, showed in **Fig. 1**, was the tool applied that gave structure to the symptoms, and the 5 Whys method allowed us to go further in defining the root causes. Afterward, a Priority Matrix showed in **Table 1**, was designed and, through a Pareto Analysis with the

Marginal Increase method, the list of the A classes was drafted. Specifically, the A class root causes which have been tackled by the countermeasures were:

- Functionalities Dispersed in Many Platforms: the functionalities needed to run the F.S. process were dispersed in several softwares;
- Excel Files and Salesforce Cases Updated Occasionally: the software that was used to support the F.S. process was often not up to date;
- High Complexity of Excel Files: Excel files that were used for KPIs computation were born for other purposes, resulting in high underlined complexity.

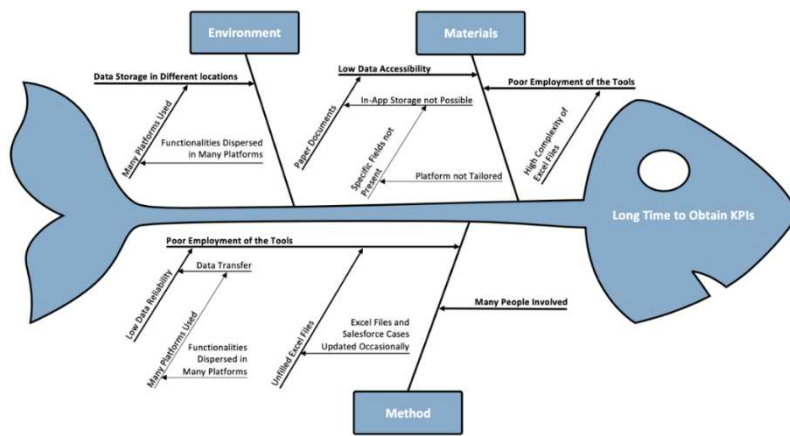


Fig. 1. Ishikawa diagram integrated with 5 WHYs

Table 1. Prioritization matrix of the root causes

Criteria/Root Causes	Data Inaccuracy	Data Incompleteness	Difficulty to Act on Data	Priority Number	Classes
Functionalities Dispersed in Many Platforms	3	9	3	5,0	A
Excel Files and Salesforce Cases Updated Occasionally	9	1	3	4,3	A
High Complexity of Excel Files	3	1	9	4,3	A
Platform not Tailored	1	3	3	2,3	B
Many People Involved	3	1	1	1,7	C

3.5 Countermeasures

Once the root causes have been defined, the next focus was the proposal of countermeasures to address mainly the Class A root causes and to be implemented. Precisely, the countermeasures applied have been:

- KPI dashboard: The team created a digitally-enabled KPI dashboard. Through exploiting all the possible functionalities provided by the implementation of the new platform, the system can store all data needed for the KPIs calculation;
- Even if the reporting functionalities offered by Salesforce Lightning are very effective, usually the last steps still need to be performed in an Excel spreadsheet. Therefore, for most of the KPIs, simplified Excel files were designed to execute those final activities;
- Salesforce Reports: A new reporting system Salesforce Lightning that can be used to pre-aggregate data present in the platform;
- Good Practice for Constant Case Closure: Office personnel every week should check all opened cases on F.S. Lightning and close the ones which are finished;
- Dashboard to Monitor Open Cases: it is a visual tool to have a complete overview of the case interventions that are open at the time of the control.

To have a better understanding of the countermeasures, an effort-benefit analysis was carried out. It's important to underline that the countermeasures do not require additional costs for the company, since they are a consequence of complete exploitation of the Salesforce Lightning platform, usage of Excel, and good practices.

Table 2. Evaluation table for countermeasures

Impact/Effort	LOW	MEDIUM	HIGH
HIGH			
MEDIUM		Good Practice for Case Closure	KPI dashboard
LOW		SF reports; Open cases Dashboard	

For the application of the countermeasures, a simulation was run to assess the results that can be obtained after the Go-Live phase. Different people belonging to the After Sales department went through all the different phases of the Data Storage and KPIs computation, applying the countermeasures. Afterward, the average time for each person (to perform each activity) and the average number of interventions per quarter (executed in 2019) were considered to obtain the final results. The whole simulation was executed in a test environment of F.S. Lightning, previously populated with specific data by the team.

3.6 Results Monitoring

Based on the numbers obtained after the simulations performed, the achievements have been 96% reduction for LT (well beyond the Nice-to-Have target) and 48% reduction for WL (overcoming the Must-Have target, but not reaching the Nice-to-Have one, yet). These results will lead to a saving of 240 hours per year from monitoring activities. To achieve the predetermined Nice-to-Have target for the WL, further training of the personnel may be necessary. Higher expertise can be reached through the daily usage of the new functionalities of F.S Lightning. Additionally, a brief survey was submitted to understand the overall personnel's perception of the new procedures. The new methodology has been positively perceived, obtaining 4.5 stars out of 5 on the overall satisfaction scale. The positive perception of the methodology will certainly play a key role in the implementation of F.S. Lightning and the application of the whole procedure to KPIs computation after the Go-Live phase.

In the closing phase, some activities were performed to help to achieve the standardization of the work allowing the improvements to last in the long term. Tutorial videos and a PDF guide have been made by the team to support the personnel in performing the activities. Tutorial videos will help the people by providing a complete explanation about how to insert data in F.S. Lightning and the PDF guide will precisely show the new procedure of KPIs calculation, step by step.

4 Conclusion

The practicality of lean in monitoring activities is still in discussion. In this sense, the present article intends to put under focus the applicability of the lean framework within this area and to provide a contribution in the field of knowledge through this case study.

The company has reached an impressive reduction in lead time through the application of lean principles in this improvement project. The A3 problem-solving tool is proven to be an effective lean methodology that would grasp the problem in its entirety to be able to solve it. In addition, applying such methodology and viewing its success allowed the company to welcome it and apply it in all of their successive projects. The outcomes of this successful story were shared with the top management and the personnel. Moreover, an environment of satisfaction was perceived by the direct actors on the monitoring activities, due to the countermeasures implemented and the guidelines for the sustainability of these measures.

Furthermore, we introduced the KPI dashboard, a lean digital tool inside their operations. We showed the successful implementation and the usefulness of a simple digital tool to make the process even leaner by reducing non-value-added activities.

Hence, this paper can be of great help to managers and area leaders to visualize how Lean approach can be successfully implemented in their organization, and to understand the advantages and synergies that this could bring for the relationship with the customers. For the academicians and students, this article will bring an optic of applications of lean methodology outside the common productive environment.

References

1. Torri M, Kundu K, Frecasetti S, Rossini M (2021) Implementation of lean in IT SME company: an Italian case. *Int J Lean Six Sigma*.
2. Rossini M, Portioli-Staudacher A, Cifone FD, Costa F, Esposito F, Kassem B (2020) Lean and Sustainable Continuous Improvement: Assessment of People Potential Contribution. In: *Lecture Notes in Networks and Systems*. pp 283–290
3. Kassem B, Costa F, Portioli-Staudacher A (2020) JIT Implementation in Manufacturing: The Case of Giacomini SPA. In: *Lecture Notes in Networks and Systems*. pp 273–283
4. Rossini M, Audino F, Costa F, Cifone FD, Kundu K, Portioli-Staudacher A (2019) Extending lean frontiers: a kaizen case study in an Italian MTO manufacturing company. *Int J Adv Manuf Technol* 104:1869–1888 .
5. Rossini M, Cifone FD, Kassem B, Costa F, Portioli-Staudacher A (2021) Being lean: how to shape digital transformation in the manufacturing sector. *J Manuf Technol Manag* 32:239–259 .
6. Kumar M, Vaishya R, Parag (2018) Real-Time Monitoring System to Lean Manufacturing. *Procedia Manuf* 20:135–140 .
7. Portioli-Staudacher A, Costa F, Thürer M (2020) The use of labour flexibility for output control in workload controlled flow shops: A simulation analysis. *Int J Ind Eng Comput* 11:429–442 .
8. Dallasega P, Rauch E, Frosolini M (2018) A lean approach for real-time planning and monitoring in engineer-to-order construction projects. *Buildings* 8:
9. Kundu K, Rossini M, Portioli-Staudacher A (2018) Analysing the impact of uncertainty reduction on WLC methods in MTO flow shops. *Prod Manuf Res* 6:328–344 .
10. Melara J, Lima RM, Souza T (2017) Lean Office: a Systematic Literature Review. 3rd Int. Jt. Conf. ICIEOM-ADINGOR-IISE-AIM-ASEM - New Glob. *Perspect. Ind. Eng. Manag.* 319–326
11. Torri M, Kundu K, Frecasetti S, Rossini M Implementation of lean in IT SME company: an Italian case.
12. Costa F, Portioli-Staudacher A (2020) On the Way of a Factory 4.0: The Lean Role in a Real Company Project. In: *Lecture Notes in Networks and Systems*. Springer, pp 251–259
13. Dorval M, Jobin M-H (2021) A conceptual model of Lean culture adoption in healthcare. *Int J Product Perform Manag ahead-of-p*: .
14. Sousa RM, Dinis-Carvalho J (2021) A game for process mapping in office and knowledge work. *Prod Plan Control* 32:463–472 .