

The interaction between Lean methodology, Quality Review and Risk Management to develop a quality culture

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Abstract

We will describe how the combination of Lean methodology, Quality Reviews, Internal control and Risk Management can be highly useful, with respect to quality of output, efficiency of work-processes and continuous improvements. Process-analysis and Quality Reviews are suitable “tools” to identify risks and control activities. Further, in the concept of continuous improvements from the Lean methodology, the monitoring of the implementation of specific risk reducing actions will be discussed – both as a part of the process confirmation, and the orientation of the Lean leadership training program. The point being that we see a lot of single initiatives conducted in Statistics Norway that with advantage can and should be combined in joint initiatives. We must emphasise that this way of working is not implemented in Statistics Norway - yet. What we describe are ideas that we hopefully will implement as a kind of best practice.

1. Introduction

Statistics Norway (SSB) is continuously working to improve performance by streamlining work processes, aiming to get more out of limited resources and enhance other aspects of quality. SSB has a long tradition for Total Quality Management (TQM) and extensive use of Quality Reviews to improve our statistical products. A general requirement in the management of Norwegian state enterprises is that it should be based on risk assessments and significance. Hence, Risk Management is an important framework and method for good governance.

The paper discusses how process-analysis conducted within the Lean methodology and the Quality Reviews can be combined with Risk Management to improve efficiency and quality in the outputs of our processes, and how this will contribute to good governance. We believe that Lean management and Risk Management easily can be combined to achieve good control and monitoring, while implementing risk-reducing actions.

The interaction between the various tools can be illustrated as in Figure 1.

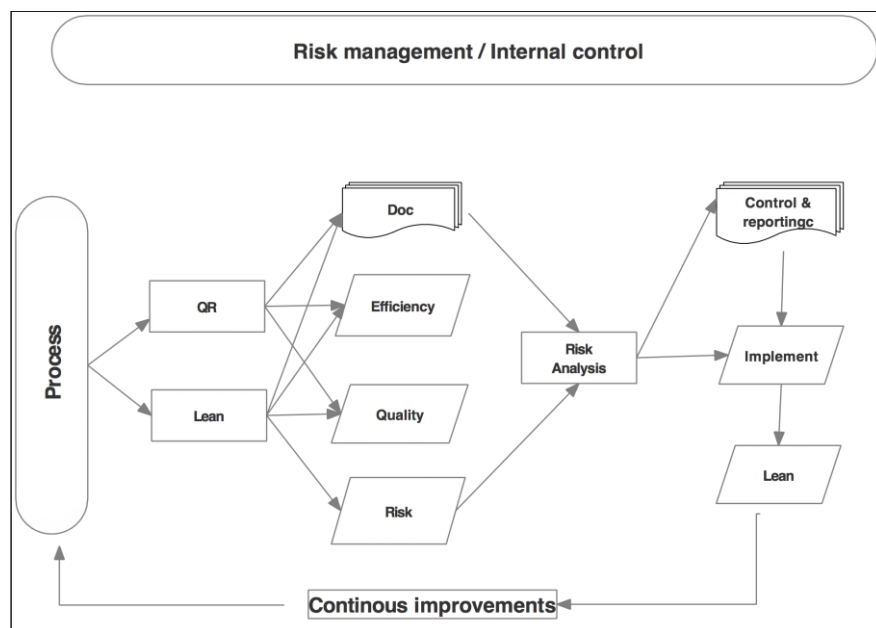


Figure 1 The interaction between QUALITY REVIEW, LEAN and Risk Management to achieve effective internal control

We present the framework and methods used in Statistics Norway in chapter 2, where we introduce the System of Management and Control in chapter 2.1., and in chapter 2.2 we describe the principals of Risk Management. In chapter 2.3 we present the Lean-methodology, and Quality Reviews in SSB is described in chapter 2.4. I chapter 3 we present how the frameworks, methods and tools can complement each other and be used in combinations to achieve objectives and results (chapter 3.1) and efficiency and good quality (chapter 3.2).

2. Framework and methods used in Statistics Norway

2.1. The System of Management and Control

In Norwegian state corporate governance, it is required that all agencies shall establish systems and routines containing internal controls to ensure that achievement of objectives and results are in a satisfactory relationship to established objectives and performance requirements, and that any substantial variance is prevented, disclosed and corrected to the extent necessary, and that use of resources is efficient.¹

¹ Royal Norwegian Ministry of Finance, 2010, Section 14 Internal control

Internal control is defined² as a process, conducted by the agency's Board of Directors, management and employees to provide a reasonable level of security for the goal achievement within the following categories:

- targeted and cost-effective operation
- reliable reporting
- compliance with laws and regulations

Effective internal control contributes to do the right thing the first time, preventing errors and negative events, as well as contribute to quality, efficiency and predictability of product and service deliveries. In other words, internal control integrated into the management contribute to achieve the objectives and performance requirements in an efficient way.

It is also required that management, monitoring, control and administration shall be adjusted to the agency's distinctive characteristics as well as its risk profile and significance.

To ensure good management and an effective and reassuring internal control, SSB has decided to establish a unified system for internal control – System of Management and Control in SSB. The System of Management and Control is based on the COSO-model³ and consists of five components as illustrated in Figure 2:

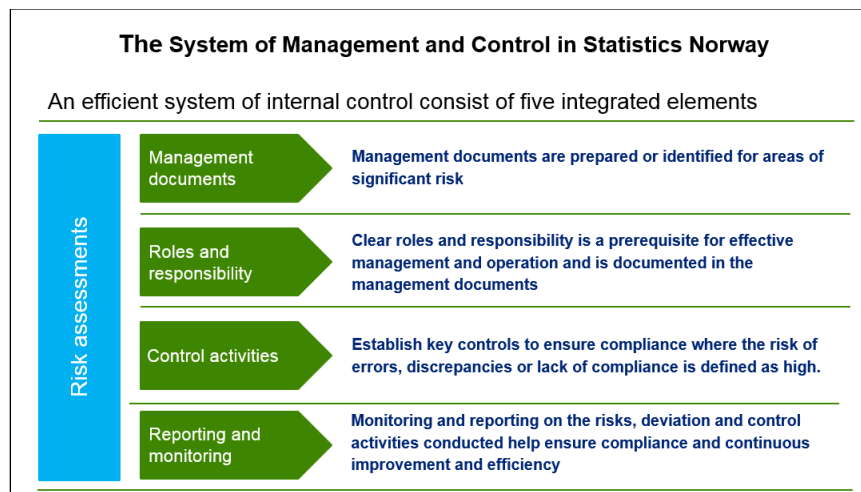


Figure 2 The System of Management and Control in Statistics Norway

Formal documents describe the System of Management and Control. Management documents are organized in a hierarchical structure, where Policy of Management and Control is the top document in the hierarchy, and indicates the superior management principles for SSB.

² Norsk Bankrevisorforening, 1996, s.4

³ Committee of Sponsoring Organizations of the Treadway Commission (COSO)

Risk Management is a prerequisite for the System of Management and Control, and risk assessments identify which areas where management documents and control activities are necessary. For each high-risk area, a policy is established that describes the overall principles of discipline (Functional Policy), and defines the roles and responsibilities related to the specific areas. Procedures that describes work processes, routines and control activities is established under each feature area and Functional Policies.

Follow-up examinations, evaluations and audits are also elements in a reassuring internal control system that help to assess whether procedures are being followed and products keep the necessary quality. Reporting and monitoring shall give management control with high-risk areas, and the basis to evaluate whether internal control is working as intended. Reporting and monitoring can also form the basis of continuous improvements. These elements are not yet fully integrated in SSB's System of Management and Control.

2.2. Risk Management

The Risk Management Policy is a document in the System of Management and Control. The purpose of the policy is to identify, assess and manage the risks that may affect the objectives and performances. The risk policy also defines risk tolerance and the scale of impact and probability. Risk Management in SSB shall contribute to:

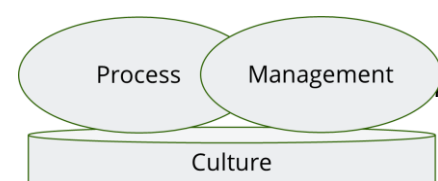
- knowledge of the risks that can affect achievement of objectives and performance, and how these can be prevented and/or dealt with
- reduce the probability of adverse events
- reduce the consequences of adverse events

Risk assessments are conducted by top management in a top-down approach, identifying significant corporate risks and measures. These risk assessments also identify which areas where new Functional Policies should be established.

Risk assessments at lower levels in the agency identify weak points in the work processes, where it is important to establish control activities, reporting and monitoring. Reporting scope and frequency should be determined by the risk assessments. If the weak points are identified as significant corporate risks, the Risk Management Policy describes how to react.

2.3. Lean

Lean is a methodology that involves all parts of the organisation in a continuous process of improvements, where all staff is participating in developing and (continuously) improving



work processes. The Lean methodology is based on the understanding of the business along three dimensions: Process, Management and Culture, as shown in Figure 3.

Lean offers a set of facilitating tools and techniques.

Figure 3 Lean model

Customer needs and quality are two vital pillars of the Lean thinking, along with other aspect of the Code of Practice.

A typical Lean process analysis in SSB is conducted in a three days' work-shop, starting with a description of the current situation (AS-IS-description). Then we continue with identification of trouble, waste and quality issues in the production flow, and finally we describe the visions for the future (TO-BE-description). The UNECE Generic Statistical Business Process Model (GSBPM) is used as a framework when a statistical process is analysed.

Before a work-shop is organised, specific goals are set connected to efficiency and quality, and we look for ways to measure what we achieve when the various improvements are implemented.

The work-shop and the actual process is documented within a standard. The standard includes an action plan to secure the implementation of the suggested improvements, and a flow-chart (swim lane) for the future process, where each step in the process is documented. The standard is also in accordance with a reassuring internal control system.

We believe that Lean Management is essential for the behavioural effect as shown in Figure 4.

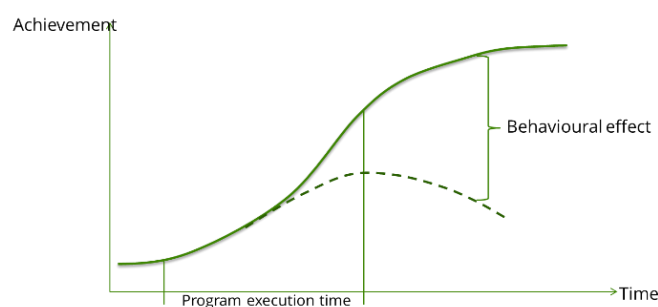


Figure 4 Behavioral effect

A leadership training program has been developed accordingly, where the focus is operation management, coordinated management, problem solving and coaching leadership and feedback.

We have also developed a process confirmation model. This model ensures that improvements are implemented, sustained and further developed.

In some occasions, we have tested the value of identifying critical steps in the production process and marked the critical process-step with a red flag in the swim-lane chart. The intention is to give a signal to the responsible statistician that this step is critical and needs special attention. Since this is not an implemented procedure (yet) it is difficult to estimate the practical value of it. In any case, in the context of this paper, we believe that identifications like this can be useful to identify control activities and need for reporting and monitoring. If the actual process-step is significant for SSB, we perform a risk analysis, and document the risks involved and measures to reduce the risks as a part of the 3 days' work shop.

As shown in the model of SSB's System of Management and Control (Figure 3), clear roles and responsibilities are a prerequisite for effective management and operation. Experience and practice shows that this is the baseline for success within a Lean program as well.

2.4. Quality Review

Statistics Norway started to work with systematic internal Quality Reviews or audits of selected statistics in 2011. The European Code of Practice (CoP) and tools linked to this have guided the reviews. The reviewing system has been integrated with our internal control to form a system that covers all aspects of work in the institution. The review process is performed very much like the European peer reviews, with the exception that specific statistics or subject matter areas are reviewed and not the institution as such. The reviews are based on three elements:

- self-assessments on the compliance with the principles and indicators in the CoP
- other documentation, process mapping using Lean techniques (Value Stream Mapping)
- focus groups to evaluate user needs.

Statistics reviewed were selected in cooperation with the producers following proposals from the reviewing team, among others based on preferences from the National Accounts and experiences from earlier self-assessments using DESAP⁴. The reviews are "audit-like" even if they are carried out by an internal team. This implies focus on evidence. Findings are presented objectively in a report that is the sole responsibility of the team. The reports follow

⁴ The European Self-Assessment Checklist for Survey Managers

a standardised structure, also including a consideration of strengths and weaknesses. Each report ends up with a set of recommendations based on the findings. The division responsible for the relevant statistics reviewed can correct factual errors, but makes a separate action list based on the recommendations. Reports and action plans are sent to the Director General and followed up.

Compared with the Lean projects, the Quality Reviews have more a character of auditing, which is also applicable as a follow-up of previous Lean work – or vice versa. Both the Lean projects and Quality Reviews utilises the CoP as a framework.

Lean and Quality Review have the same purpose, but are used a bit differently in SSB. From 2016, we have strengthened the bond between these initiatives. We believe that it is possible to a larger extend, to combine Quality Review and Lean in a single initiative.

3. How combinations of methods to improve efficiency and quality will contribute to good governance

3.1. Achieve objectives and results

To achieve objectives and results SSB prepares operating plans at different levels, accomplish risk assessments and implement measures. The management follow up activities and implementation of measures through standard internal reports and by ad hoc reporting in top management meetings.

Regarding the requirements of achieving objectives and results in an efficient way, we have developed a leadership training program, as mentioned above, where the focus is on:

- operation management
- coordinated management
- problem solving
- coaching leadership and feedback

Operation management is a kind of a balancing act, on a regular basis. It is all about balancing resources and demands in a way that makes it possible to do the ordinary production tasks in combination with various kinds of improvements. The improvements should be derived from the corporate objectives, and the activities (actions) that needs to be done, is monitored visually on whiteboards (visual management). This is coordinated in the management structure. Visual management is illustrated in Figure 5.

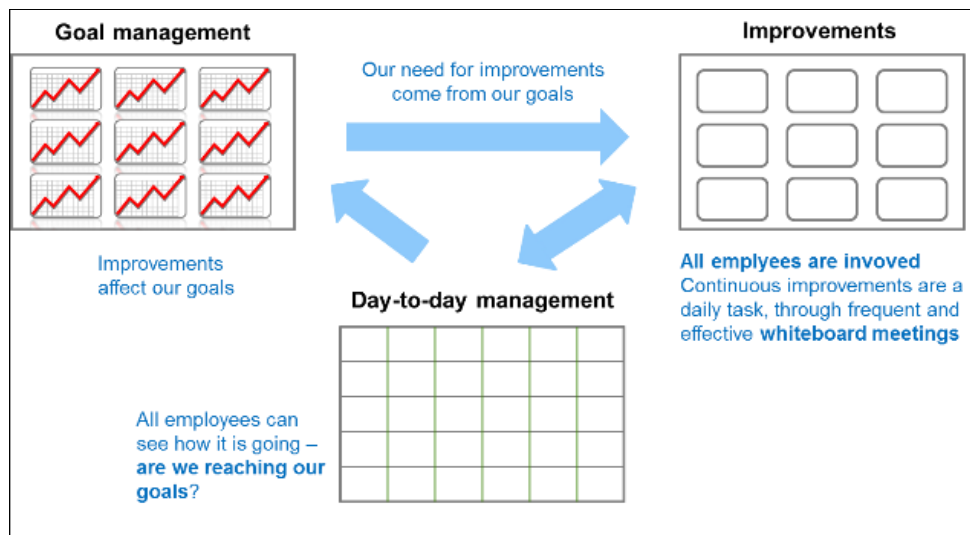


Figure 5 Visual management

Coordinated management is among other things about monitoring and control. Coordinated management is a technique that links different boards in a structured manner to give the managers a tool to monitor focus areas. The top manager (director of...) has a goal on his/her board. This goal is decomposed into milestones by the head of divisions, and made visual on their boards. In this way, the staff will know what is expected of them. The lowest level of managers, the team leaders, breaks down milestones into activities. The team leaders and the head of the division are responsible for the resources, and the balancing of the different operations.

The coordinated management also implies the time and sequence of the different meetings. The frequency is set in each department. The structure is designed with the intention to intercept deviations from the plan, and act on them. This will also reduce the risk.

Structured problem-solving is also a way to improve, and problem-solving tools are a part of the Lean toolbox. These tools help us to find solutions by using a structured and visual approach, and by drawing conclusions based on for example the understanding of cause-and-effect relationships. A root cause analysis is focusing on problem-solving in a constructive way instead of blaming others. The affected employees are involved in the process of identifying the problem and finding solutions. This creates a greater understanding of the issue, a culture of change and thus an acceptance by the people involved. They will have ownership of the measures to deal with the risks.

Coaching leadership is about making a good culture for continuous improvements.

The reason why we developed the training program based on these four elements, is to help

the agency to achieve goals. We believe that visual management used in a structured way will be helpful connected to both the internal control and in the aspect of Risk Management. It is all about what you decide to monitor. In other words – what your focus should be.

3.2. Achieve efficiency and good quality

While the purpose of Risk Management is primarily to identify, prioritise, and implement measures to reduce risks and reach the achievement of objectives and results, the Lean-philosophy focuses on customer value and effectiveness in combination with good quality.

According to the Provisions on Financial Management in Central Government, the internal control system shall prevent management failure, errors and deficiencies so that achievement of objectives and results are in a satisfactory relationship to established objectives and performance requirements, and use of resources shall be efficient.

Control activities – key controls – are essential elements in an internal control system. Control activities should be established where there is a high probability of errors, where the consequence of error would be significant, and where laws or regulations require it.

The goal of internal control is to achieve results and efficiency. A possible drawback could be that the extent of control activities is larger than necessary – with the result that the production process is less efficient as it could be. In this context, the Lean methodology can be useful to contribute efficiency when establishing key controls. Lean advocates the principle that a product should be handled by the fewest number of people. The systems of internal control can lead to the opposite (“four-eyes-principle”).

When performing a process-analysis within the Lean concept, as already mentioned, we have tried out an approach where a critical sub-process is marked with a red flag. This flag is a signal to the statistician that there should be special attention to this sub-process. These flags pinpoint a single problem where actions could be taken to improve. The problem could be that the sub-process is outdated, and needs a total renewal. Alternatively, the flag can signal that the sub-process is complicated and crucial for the production process, and therefore needs special attention from the employee. The problem can also be lack of standardisation. There might be sufficient existing alternatives within the organisation, a local form of “best practise”, which could solve the problem. Hence, standardising should contribute to risk reduction. The red flags in Lean process-analysis indicate high-risk and will almost always demand control activities as described in the System of Management and Control.

Risk assessments can be used to identify errors and risks which may prevent the achievement of objectives. Risk assessments can also be used to identify the areas that have the greatest potential for improvements when it comes to efficiency. However, in risk analysis it can be a challenge to identify what constitutes the actual risk and what are consequences of adverse events. If the risks are complex, unclear, involving different individuals or divisions across organisational units, or include the challenges related to culture and organisation, it may be appropriate to use problem-solving tools within the Lean-concept to understand the scope and see the big picture associated with risks.

While the purpose of System of Management and Control and Risk Management in SSB are primarily to obtain efficiency, and prevent errors, the Quality Reviews are important in efforts to ensure fulfilment of user needs, good quality of output, and make sure that SSB lives up to the European principles (CoP) and other international standards for production of official statistics. These initiatives are complimentary.

Quality Reviews are, as mentioned above, conducted as audits and evaluations, and identifies weaknesses and suggest improvements to achieve better products. Through their recommendations, better quality in statistical production processes and output can be ensured. Risk assessments can be used to identify and prioritise statistics for Quality Review. At the same time, risk assessments also will contribute to the Quality Review, to identify areas where risks of error are significant. Quality Reviews should be an integrated part of SSBs internal control system.

Lean has so far been implemented both with focus on the work-processes (efficiency) and to the quality of the output.

4. Conclusions

This paper has outlined how process-analysis conducted within the Lean methodology and the Quality Reviews can be combined with Risk Management to improve efficiency and quality in the outputs of our processes, and how this will contribute to good governance.

We believe that the reason why these frameworks and methods not always are well coordinated is because the initiatives traditionally are inspired by and partly subjected to various principles of quality work and public governance. Quality Reviews and Lean are related to principles developed specifically for efficiency and quality in output, such as European CoP, while risk management and internal control systems traditionally have been

conducted with financial management. This is also reflected in the fact that responsibility for internal control and quality work often are organised in different divisions in a statistical agency. In an expanded perspective covering the entire agency, the frameworks and tools complement each other.

Visual management, as described in chapter 3.1, is a suitable and efficient tool to achieve goals, but is missing some parts to satisfy requirements for an internal control system. As shown in chapter 2.1, an internal control system requires control activities, documentation, reporting and monitoring.

It is described in chapter 3.2 how Lean process-analysis can contribute to efficient processes, and that we have tried out an approach where critical sub-processes are marked with red flags. In an internal control system that kind of red flags should be followed by control activities and reporting to reduce risks for errors.

Findings from Quality Reviews are being reported in standard reports to the Director General. Combinations of Quality Reviews and Risk Management in a more systematic way can, as we see it, contribute to quality and more efficient goal achievements.

By combining the frameworks and methods, as described in this paper, with a common system for documentation, reporting and monitoring, we believe it will contribute to good quality in statistic production and efficient public governance in statistical agencies.

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