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National Accounts at Statistics Sweden

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Implementing a Quality Management System for the National Accounts at Statistics Sweden

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Abstract

Quality of the statistics produced within the department of National Accounts (NA) – **product quality** – is a function of the quality of working procedures – **process quality**. The quality of working procedures is itself a function of how good we are organized, how we manage and how we continuously improve – **organizational quality**. Process quality and organizational quality can be managed with a quality management system – a system that specifies *who* (role and responsibility) does *what* (activity), *when* (planning), *where* (IT environment), and, most importantly, *how* (work instruction).

The development and implementation of a quality management system for the NA at Statistics Sweden was intensified in April 2010. Up until today the "quality project" has shown improving results, involving over 100 managers and employees at Statistics Sweden, the majority working at the Department of NA. A dozen of projects have focused on the different components of the quality management system such as roles and responsibilities, competence, communication, process management, work instructions, quality assurance of Excel and development of IT solutions.

The quality management system itself is designed and developed in "product spaces" in SharePoint, accessible for all managers and employees. Several workshops and seminars have been held. Managers and employees have been invited to discuss, question and contribute to the work. Since the beginning a steering group, led by the Director General of Statistics Sweden, has followed up the progress. Both external and internal national needs and requirements as well as the development of a quality system for the NA within the European Statistical System (ESS) have been taken into account.

In the paper we will describe how the quality work has been organized, why it was intensified, what projects have been run, what results have been achieved and how the project organization have made the objectives understood and accepted among managers and employees. The overall objective is set to the end of June 2012, when the quality management system is supposed to be fully implemented and in use.

Introduction

In April 2010 the Director General of Statistics Sweden decided to put together a team that had the assignment to develop a system for quality assurance and quality control for the National Accounts (NA), i.e. a quality management system. The reasons for this approach were primarily three. The annual 2009 external audit of Statistics Sweden, performed by the Swedish National Audit Office, showed that there were some deficiencies in e.g. the IT support of the NA. In addition, internal risk assessments for the NA showed a similar pattern. Last but not least, an error occurred in the NA statistics that was published in March 2010. As a consequence, the Director General wanted a robust quality management system for the NA to prevent errors and to improve the working environment for the staff.

Initially the team mapped all the existing components and activities in such a system and put together an action plan. In August 2010 activities and projects started in order to fill the identified gaps and to implement the components in the system. Since then, the work has continued and the first major milestone was set to June 2012 when a first version of the system, called NIKE, was in place. There are still activities left to do, as always, when working with quality assurance and quality control, and they are a part of the ongoing continuous improvement work for the NA at Statistics Sweden. The process resembles a long distance running race where many laps add value to reach the overall objectives, and not like the 100 meters final where the goal is straight ahead.

Quality Management at Statistics Sweden

Statistics Sweden has the vision *"Statistics Sweden is of world class standard in refining data to statistical information, adapted to the customers' needs."* This is a multiple task, being a national statistical institute working both on commission and competing on the market. Different customers and stakeholders have various requirements, and the internal and external demands on increasing efficiency and effectiveness highlights the importance of a functioning management system (Lisai et al. 2010).

A quality management system deals with all aspects in an organization, such as leadership, strategy and competence, i.e. *organizational quality*. Organizational quality is rather new and do not exist in traditional quality frameworks adopted by statistical organizations. In the European Statistics Code of Practice (Eurostat 2005) the statistical output quality dimensions[1] describe the long-established *product quality*. Additionally, in the last 15-20 years, official statistics has also focused on the way we do things, i.e. *process quality*. Managed separately, these three levels of quality are not sufficient, but together, they address all important aspects in an organization (Lyberg et al. 1998).

The Price Statistics unit within the department for Economic Statistics initiated a a project towards implementing a quality management system, one year earlier than the NA department. The approach used by NA is very similar to the one developed by Price Statistics. It was decided early in the quality project that unnecessary deviations from the work at Price Statistics were to be avoided.

Quality Management System for the NA

Quality management systems are designed to reduce the risks of errors being made in the production process. Quality management systems should also sup-

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[1] The product quality dimensions are relevance, accuracy and reliability, timeliness and punctuality, coherence and comparability, and accessibility and clarity. (Eurostat 2011)

port the management and employees in the case of errors. The consequences of erroneous data used in an accounting framework, like the NA, are not easily overseen and traceability of data is therefore essential. A quality management system for the NA is ultimately the tool that secures the quality and efficiency in the production process of NA and hence generates statistical information of high quality to the users.

Prior to the start of the quality project, quality and quality management issues at NA where addressed with the assigning of quality coaches that supported the departments' work with these issues. Existing work, checklists, planning documents etc, where however not standardized over the nine different statistical products that make the core and satellite accounts at Statistics Sweden. To develop a quality management system with the same properties for core accounts, production accounts, non-financial and financial -sector accounts, regional accounts and satellite accounts; e.g. ESSPROS, WAR, health accounts etc, was central to the quality project.

The quality management system developed for the National Accounts is built upon three components: IT environment where the NA is produced, a support system for the managers and staff working at the NA department and a control system based on internal and external revisions.

The IT environment

National accounts are produced in a complex IT environment, with numerous IT applications and several Excel spread sheets. A high level quality management system requires a robust IT environment that reducers, or even eliminates, the possibility of errors. Systems shall be documented, tested and implemented in a systematic way that there is no doubt regarding responsibility for maintenance and development or changes made due to adjustments in the everyday production. Excel spread sheets shall be standardized and designed in such ways to assure e.g. traceability. At the NA focus has been put on these components. The approximately twenty IT applications have been documented and controlled according to the common principles developed at Statistics Sweden in 2010. Some of the results of the quality project within the NA department are described below as they individually or in combination with other project results, have led to direct and substantial improvements of the IT environment.

IT applications

Early in the quality project development needs were identified in two of the centrally managed IT applications. To improve the security of the National Accounts production system, both the IT application for the calculations of the quarterly value added for market producers and producers for own final use as well as the IT application for the calculations for the general government have been improved. Consequently, the extensive work with shadow calculations that was required previously within the NA system to ensure the performance of these applications is no longer necessary.

The profit and loss account of central government, which is a major source of input to the calculations of general government, was earlier delivered in Excel format. The delivery has been automated and is now stored in a SQL database using the standard model of Statistics Sweden. Reduction of manual handling and increased opportunities for analysis increases the quality and effectiveness of this important area.

Excel

The amount of workbooks in Excel used for the calculation of national accounts is extensive. Efforts to create a safe solution for these calculations that satisfy the requirements for documentation and traceability of data were one of the highest priorities of the quality project. Having initially identified the files used to produce estimates three different solutions were used.

In cases where multiple inter linked workbooks together form a production system, the quality project decided to create IT solutions in SAS. One example is wages and employment where a large number of workbooks have been replaced by a SAS solution. Hence, a more safe and secure and essentially more effective approach has been created.

For individual or small production systems in Excel, a standardized structure has been developed. The structure was drawn up at the NA department in cooperation with system experts. A standardization of the design of about 700 workbooks in Excel has subsequently been implemented. A large number of work instructions have been written or adapted to workbooks with a standardised format. In order to quickly create high-impact within the implementation, the files with the highest risk were prioritized in the initial stage.

Adaptation to the standard model has not been considered possible for approximately 10 percent of the workbooks used in the production In order to secure the whole NA production system alternative ways such as double staffing were introduced to these calculations. An assessment of the risk and consequences of mistakes in the calculations were the basis for the choice of method of securing.

The standardized workbooks are version controlled and stored in a new standardized folder structure matching Statistic Sweden's general production process. The transition to the new folder structure applies for all materials used in the production of National Accounts. Access to the folders is given on demand and is controlled by creating access groups linked to the folders. Review of access is conducted quarterly and the assignment of access is based on an established policy that is in line with Statistic Sweden's recommendations.

It is the standardized sheet structure, the version control of files, the new folder structure and the work instructions in the quality management system that combined secure the part of National Accounts production system that consists of workbooks in Excel.

The Support System

The quality project within NA has introduced a new work approach where the production of national accounts is managed by lists of activities along with job descriptions stored in the national accounts quality management system, NIKE. The system indicates who (roles and responsibilities) that perform what (activity), when (planning), where (IT Environment) and how (work instruction). Furthermore the execution of the activities is logged. A member of the management team has a special responsibility for development and administration of quality management system. Information on quality management, quality work at SCB and management model is included as a module in the program developed for new employees at the NA department. The quality management system is described in the National Accounts quality manual. The manual is updated annually.

NIKE is the hub of the production process. Staff members use the activity lists as a tool for planning their work. The lists are personalized to fit the individual needs of staff. The lists indicate at what point in time the activity should be undertaken. Hyperlinks to work instructions are imbedded in the activity lists. The IT environment is at present outside of the support system. The work instructions point to the IT environment but for safety purposes excel spreadsheets and SAS scripts are stored in the newly designed folder structure. After performing an activity the staff member signs the activity in the activity list.

Choosing SharePoint as the technical solution for the support system made it possible for the construction of the system to be done within the NA department. The construction of the activity lists and their maintenance are done as part of regular work of staff members. Implementing the support system has required a minimum of technical support from Statistic Sweden's IT department.

The Control System

After implementing a quality management system the way forward is to work with continuous improvements aided by a control system. This is not in place yet for the NA. The planned control system has three different levels. First level is manager follow-ups were the management team decides on products or process to be followed up. This could consist of reviewing documentation, work instructions, spreadsheets, folder structure, access etc. These reviews are planned ahead and decided by the management team. Statistic Sweden internal audits is the second level of review. The audit focuses on how the actual execution of a process conforms to the correspondent work instruction. It is Statistic Sweden's Quality Director that ultimately decides which products to be audited. The third level of control is the internal review carried out by Statistic Sweden's Chief Audit Executive. The internal review focuses on reviewing the processes for internal management and control and making suggestion for areas of improvement. In addition to these three different levels of the control system there are external reviews of the NA.

Implementing the System at the NA

The quality project has been run in three different stages. The first stage identified areas for improvement and set up the design of the quality management system. This was done in a small group of NA experts and quality experts within Statistics Sweden. The second stage involved more employees and addressed the areas with highest need for improvement. In the third and final stage the whole department was involved in the project finalizing the actions set up in stage one and two.

The project organization has changed during the three stages of the project. The project has had three different managers and three different sets of members. In the last stage of the project the newly formed management team led the project. During the three stages the project has continuously reported to the head of the department of National Accounts. A steering group led by the Director General has received written statements of the progress of the project at nine occasions. The steering group was active and has, through decisions on the priorities of the project, made significant impact on the outcome.

To secure managers and employees understanding and acceptance of the objectives of the quality project a communications plan was created in the second stage of the project. The project has used Statistics Sweden's intranet to publish finished work. Besides arranging five half day seminars and one whole day con-

ference, weekly newsletters and unit staff meetings has also been used. The work of the quality project has also been presented at Statistic Sweden's Scientific Council.

Of all projects undertaken during the quality projects the work with adapting Excel spreadsheets to a standardized structure was by far the most time consuming. After the initial focus on the most high risk files the adaptation to the standardized structure was undertaken. Each product within the National Accounts framework first identified the spreadsheets used to produce estimates. Weekly follow ups with focus on progress of spreadsheets conversion were held. Progress was measured as the ratio of adapted spreadsheets to identified spreadsheets and reported to all members of the staff.

Conclusions and future challenges

When an initiative is intensified in an organization, no matter the reason, it puts high demands on managers and staff. The everyday work is supposed, and expected, to flow as the day before and new things are about to be developed and implemented. From the work done at the Statistics Sweden NA a few conclusions can be drawn.

First, a work like this, with the objective to implement a quality management system, requires persistence from all those who are concerned. The managers need to maintain focus on what is important and to prioritize within current plans and with the possibility to shift the direction if needed.

Second, the staff must be involved in the improvement work. It is often a change, maybe not as dramatic as one can think, but still a new mindset that has to be accepted and adopted by all those working in the concerned group.

Third, and maybe the most important conclusion, is to continuously show results of the progress of the change. This is important not only for the staff, but also for different stakeholders. Understandable indicators that show the development for some of the most important aspects help creating an understanding for the change.

Fourth, it is very important that things are done in the right order. What was the need for change? How did we start working on this project? Always identify the root cause of a problem and put together realistic activity plans that lead you to your objectives.

Finally, the system implemented within the NA is a "low tech" system. It is an easy way to get the upper hand of the situation, to create traceability in the everyday work and a structure that is independent of both managers and staff. Further, it is built in an environment that is intuitive and easy to adopt.

Some of the future challenges for the people working with the NA system are how follow ups by managers and production managers are incorporated in the everyday work and the use of the quality management system. It is also important that the third component, the control system, is developed and put into place. And most vital for the ongoing success is how everyone, every day and in a systematic way, works with improvements. We all contribute to the continuous improvement work that is the backbone of a quality focused working environment.

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