

Reengineering the statistical production process and the changing needs for human resources – some experiences from Norway

Contributed paper submitted by Statistics Norway¹

Introduction

The volume and variety of official statistics produced in Norway has been developing rather fast over the last 30 – 35 years, linked to increased demand both at national and international level. This development has been made possible through growing resources to the production of official statistics. However, the increased accessibility to diverse numeric administrative sources and the technological development which facilitates the registration, checking and management of large data sets, have contributed substantially to this development. Thus the increasing volume of statistics can be produced and disseminated with a lower input of manual handling. This change in processes has also led to changes in the requirements for manpower and not least changes in required competences, and it is expected that this process will continue.

This paper will show some lines of development within Statistics Norway and address some issues related to the future requirements in relation to the type of competences needed for statistical production.

As a background it is necessary to take into account some key features of Statistics Norway:

- A centralised statistical system - a major part of official statistics is produced by Statistics Norway
- A register based statistical system - but still a lot of statistics based on questionnaires and interviews
- Important financial contributions directly from users - around 30 per cent of the total budget
- Important research activity - one of the largest social science institutes in Norway with almost 100 researchers
- Present staff around 1000, with around 60 per cent in Oslo and 40 per cent in Kongsvinger (90 km from Oslo). No regional offices.

A look in the mirror

The expansion of statistical system of Norway especially in the 1970s and 1980s meant a considerable increase in staff for data entry, control and editing, especially in connection with the 1980 census.

During the 1980s Statistics Norway developed an internal training programme in order to provide systematic training of staff with no academic background (upper or lower secondary background). The recruitment of such staff, especially in Kongsvinger, was quite easy at that time. With targeted training this staff has been very stable and efficient in running the statistical production processes in many areas.

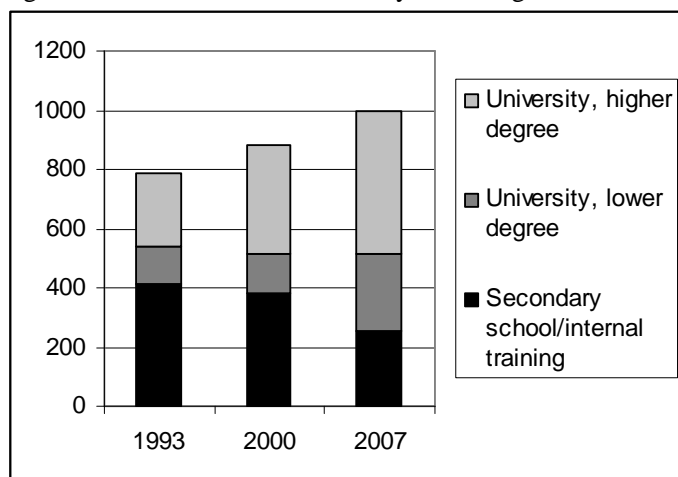
However, after the 1990 census operation there was an overcapacity of staff in the field of data registration and control. This overcapacity was increased through the gradual process of extending the use of administrative sources instead of direct data collection, and replacing key punching by optical

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reading solutions. Thus a transformation program was initiated. To make use of the capacity and the competences in the field of data entry Statistics Norway on a temporary basis took on some tasks related to massive data registration from other governmental bodies. At the same time, those who wanted, were given the support for additional internal or external training courses, or offered on the job training in a subject matter unit.

In 1993 more than half the staff had non-academic background (secondary school or primary school, possibly supplemented with internal training.)(Fig. 1), whereas only 31 per cent of the staff had higher degree academic background.

Fig. 1. The staff of Statistics Norway according to level of education



The expansion of Statistics Norway in the late 1990s mainly meant recruiting staff with higher academic education, which in 2000 counted 42 per cent of all staff. This expansion was strongly related to the integration of Norwegian statistics with the European Statistical System, which also meant more staff to analyse the requirements, and to transform these requirements into new statistical production processes and products.

Thus also the systematic training program for non-academics was closed down and replaced by a series of training courses adapted on an annual basis to the needs of all staff.

The number of non-academics decreased slightly during the period 1993 – 2000.

After 2000 the expansion of Statistics Norway continued in response to new national and European requirements, by recruiting academics with higher and lower degree. At the same time the number of non-academics was reduced to around 25 per cent, mainly by replacing non-academics with staff with academic background.

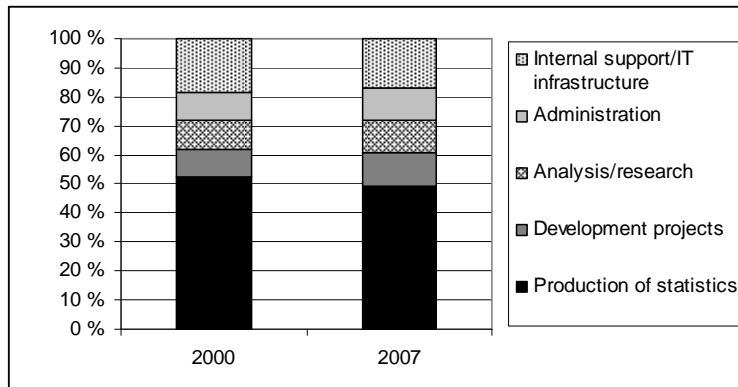
The process was made possible by a more systematic use of administrative sources which was enabled by the new statistical legal act in 1989, and through implementation of new technologies related to data collection, data entry and data management.

By the direct utilisation of administrative electronic files the resources used for data entry and data editing were reduced. Furthermore use of scanning and electronic questionnaires contributed to improved efficiency in this part of the production process.

By analysing how available man power resources (holiday and sick leaves excluded) are distributed among main areas of operation (Fig. 2), it can be seen that resources going to production and compilation of statistics has been slightly decreasing from 2000 till 2007, but is still 49 per cent. On

the other hand more resources are being used on development projects, raising to 12 per cent in 2007. This fact illustrates the increased focus on improved tools and methods to produce statistics more efficiently and with higher quality – which also affects the requirements for new types of competences.

Fig. 2. Distribution of time use according to main areas of operation. 2000 and 2007



The resources used on general support, including IT infrastructure has decreased, whereas somewhat more resources are used on research/analysis and administration.

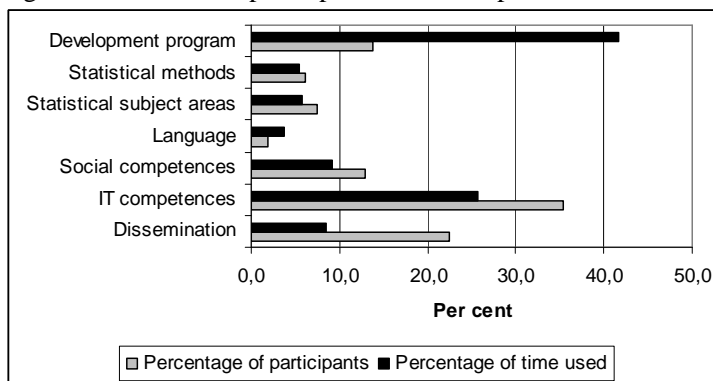
It is worth noting that the study background of staff has become more and more diversified. Some years ago the majority of staff with master degree in the subject matter and research departments had a socio-economic study background (in 1991 around 50 per cent). Now around 27 per cent have a master degree in social sciences, which could mean different directions of specialisation such as economics, geography, sociology or political science. Another 22 per cent have a master degree in socio-economics. The rest has quite varied background, including for instance business economy, mathematics, engineering and agricultural economy.

Training in Statistics Norway

As the background of staff is becoming more and more varied it has been necessary to develop more targeted training. It is especially acknowledged that not all new staff get sufficient introduction to statistical methods and understanding during their studies.

The internal training programme consisted of 96 courses in 2007 with around 1200 participants, using 18 000 hours on course attendance. About one half of the staff attended at least one course.

Fig. 3. Distribution of participants and time spent on main areas in the course programme. 2007



A major part of the resources went to the development program which has two main branches; introductory courses for new staff and a program for project and teamwork (Proteam).

The introductory courses for new staff runs according to needs and covers altogether 8 days, of which 3 days are allocated to statistical methods. A redesign of this course is under way in order to target the course better to actual needs of new staff.

The program on project and teamwork runs over 8 - 9 months with four joint training courses and a total of 12 days. In addition, the participants are expected to work on a regular basis on the project which is chosen for the project work. The objective is to provide the participants with knowledge on project work, to develop competences for cooperation and team building and to introduce how Statistics Norway defines quality work.

A major part of the training is also allocated to IT competences. Several of the courses are rather practical, such as the use of powerpoint, a project planning tool or e-mail, whereas other courses are more IT specific such as use of Unix, SAS or Excel.

In 2008 around 460 000 Euros are budgeted for different internal training courses.

In order to motivate training and competence development of academic staff Statistics Norway has implemented a scheme for qualification to statistical adviser. This programme started with a pilot in 2002

The target group is employees who have worked in Statistics Norway 5 years or more, having at least equivalent to bachelor degree academic background.

The candidate should write a comprehensive application with CV describing various work tasks that i.a. includes work with international or national committees and programmes. The candidate should join written documentation such as articles, notes on plans and method as well as final publishing of statistics.

The qualifications of the candidate are to be evaluated by a committee of appointed experts with relevant qualifications. The committee must include a minimum of four experts, and at least one must be statistical expert external to Statistics Norway, for instance from Sweden or Finland.

The candidate is to be evaluated on the basis of the following documentation:

- Application and CV
- Written documentation on work performed
- Statements by the responsible manager

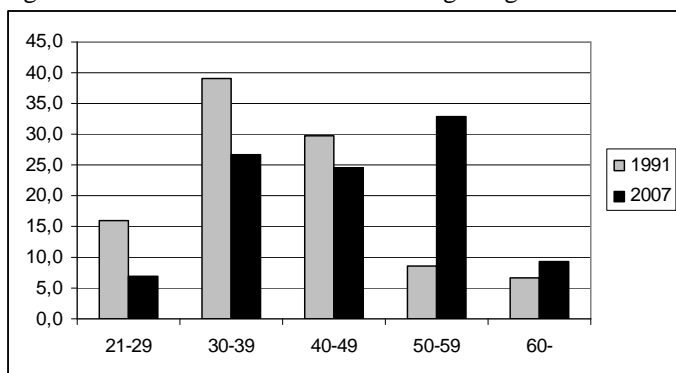
The candidates are evaluated on the basis of formal qualifications, qualifications in statistical methods and qualifications in official statistics, but they should also document experiences from different fields of statistics and teamwork abilities.

In the period 2002-2007 there were altogether 84 applicants of which 41 were judged as qualified for being statistical adviser. An evaluation considers that the qualification programme has to some extent reduced turnover and also contributed to improved quality of statistical production in several areas.

What is around the corner?

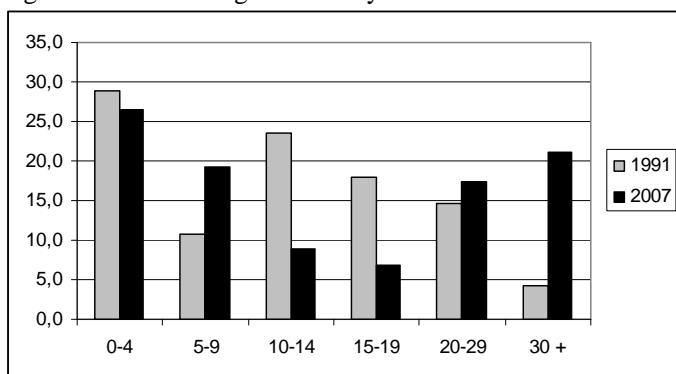
Statistics Norway is facing a challenge due to an aging work force. As can be seen from Fig. 4, around 40 per cent of the staff is now more than 50 years of age. In 1991, by comparison, almost 40 per cent were in the age group 30 – 39.

Fig. 4. The distribution of staff according to age. 1991 and 2007. Per cent



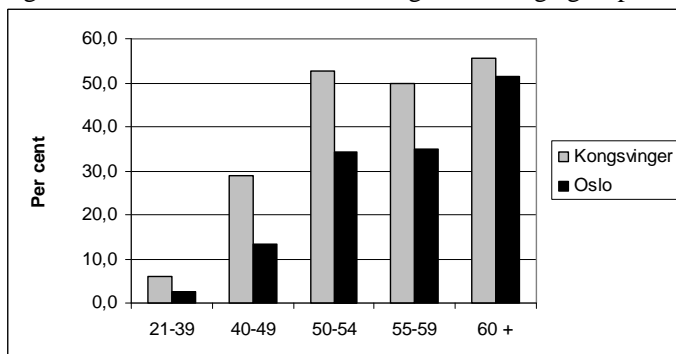
Thus also the degree of seniority is changing. In 2007 almost 40 per cent have worked more than 20 years at Statistics Norway, whereas this percentage in 1991 was below 20. It is interesting to note that the percentage with less than 5 years of service was at the same level in these two years, 29 and 26 per cent.

Fig. 5. Staff according to seniority. 1991 and 2007. Per cent



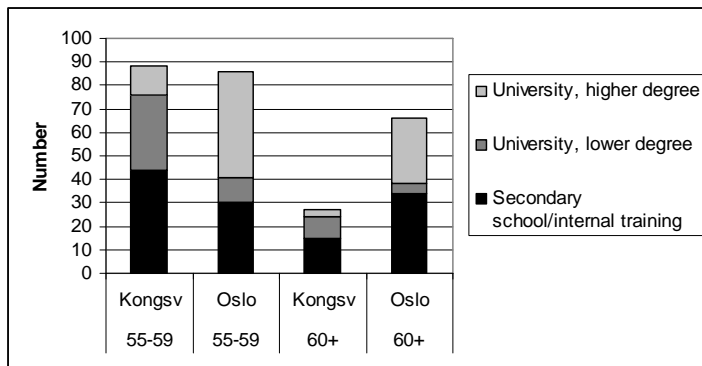
A challenge is also that the majority of staff in age group 60+ has non-academic background both in the two locations of Statistics Norway in Oslo and Kongsvinger (Fig. 6). In Kongsvinger this is true for all age groups above 50 years.

Fig. 6. Staff with non-academic background in age groups. Oslo/Kongsvinger. Per cent



In absolute numbers (Fig. 3) this will mean that in 5 – 10 years time around 60 persons both in Oslo and in Kongsvinger with non-academic background will retire. Many of these have been in Statistics Norway all their working life and are very competent in running the day to day operations in different areas.

Fig. 7. The number of staff in higher age groups according to educational level. Oslo/Kongsvinger



Another challenge is that the turnover of new academics is relatively high (almost 10 per cent of the staff left permanently or unpaid leave in 2007), which is creating worry for the stability of competences and production capacity in some areas. One reason for this turnover might be that new academics with a master degree are not satisfied with the job content, even if one also should take into account the general pressure of the Norwegian labour market, the wage level in the governmental sector and that the new generation is less stable in relation to the labour market.

Thus Statistics Norway faces several challenges to be addressed:

- What will possibilities to recruit and keep well qualified staff – in both the two locations of Oslo and Kongsvinger in future?
- What are the effects of technological and methodological development in relation to required competences?
- How to develop a more targeted training programme that takes into account the background of the staff and the new requirements?
- How can we cooperate with external partners in order to ensure future recruitment with proper competences?

In 2007 Statistics Norway decided upon a strategy for human resource as a sub strategy of the overall strategy document ‘Strategy 2007’ (http://www.ssb.no/english/about_ssb/strategy/). The main headlines of this strategy are:

- Forward-looking and transparent management
- Sharing knowledge
- High-quality on-the-job training
- An attractive employer
- Expertise development – a joint responsibility

This strategy is being implemented through different concrete actions in the annual work programmes.

A programme for improving business processes

Statistics Norway started early 2008 a programme for improving and standardisation of the statistical production system (‘FOSS’). The program focuses on developments in the following areas:

- Development of standardised work processes, methods and IT systems

- Development of systematic quality measures and control
- Development of the organisation and competences within the organisation in accordance with the previous two areas

An action on competence development in relation to FOSS is going to start, and there are some assumptions that will have to be analysed and studied further:

- The success of the whole programme will depend very much on available competences and capabilities, not least capabilities for reorientation and innovation and willingness to take on new tasks.
- The programme, if succeeded, will change the required competences; some technical and routine oriented tasks will be standardised/eliminated, whereas the need for more analytical and management competences will increase.
- The programme might change the needs for internal training, motivate for increased internal job rotation and also the specification of competences when recruiting new staff.

Some projects examples within the FOSS programme:

- **Integrated system for estimation and editing (ISEE):** To develop and extend the usage of standardised methods for estimation and editing including a general IT solution
- **Common metadata base for input data (SMED):** To develop/adapt a user-friendly metadata base to be used for different data collection projects.
- **Coordination of samples for economic surveys (NorSamu):** To improve, standardise and coordinate the planning of samples and the sampling.

These projects, as well as other projects, are assumed to have major impacts on the future needs for man power, competences required and on internal organisation. It is for instance assumed that due to standardisation across the organisation, staff can more easily change job. At the same time, increased internal rotation might be a requirement in order to contribute to standardisation of working methods and to develop a common culture. It is further assumed that these projects will lead to less routine work, more challenging tasks and more time for analysis and follow up of users.

It is also assumed that the fulfilment of the FOSS programme might affect the overall organisation. An increased focus on standardised business processes, linked to the business model shown below, might lead to new ways of thinking about the way different functions and tasks are distributed. To some extent Statistics Norway already has centralised some functions related to data collection in a department for IT and data collection. But there might be further changes as a result of the ongoing process. One issue is the degree of centralisation of IT, where there now are some IT units linked to some departments.

The main elements of the present organisation are:

Four subject matter departments:

- Economics, energy and the environment (6 divisions, staff around 127)
- Social statistics (5 divisions, including an IT division, staff around 137)
- Industry statistics (5 divisions, including an IT division, staff around 162)
- National accounts and financial statistics (5 divisions, including an IT division, staff around 127)

Research department (7 divisions, staff around 95)

Four horizontal departments:

- Management support (2 divisions, staff around 47)
- Administrative affairs (3 divisions, staff around 55)
- Communication (3 divisions, staff around 55)
- IT and data collection (6 divisions, staff 150)

Statistics Norway has thus a mixture of a subject matter oriented organisation and a functional organisation. Over the years there have been different trends in direction of centralisation/decentralisation. Centralisation has also been linked to functional specialisation. For the moment there might be a push in the direction of functional specialisation, partly as the result of the mentioned FOSS programme.

Towards a framework for competence description

In order to be better plan future recruitment and training it has been considered useful to draft and discuss a framework for the description of different competences. In this process it has been very useful to learn from the examples and experiences from other countries.

One interesting example is from Australian Bureau of Statistics (ABS) as presented in a document to the Conference of European Statisticians in 2006 (ECE/CES/2006/22). There it is differentiated between 'Core capabilities' and 'Job specific capabilities'.

As **Core capabilities** are defined as those capabilities required of all employees in the ABS, regardless of role or business unit. These are generic capabilities and form the foundation for statistical excellence. As the main items of core capabilities are listed:

- a) People and Communication
- b) Achieving Results
- c) Thinking
- d) Understanding the Business of Statistics
- e) Understanding the ABS Environment

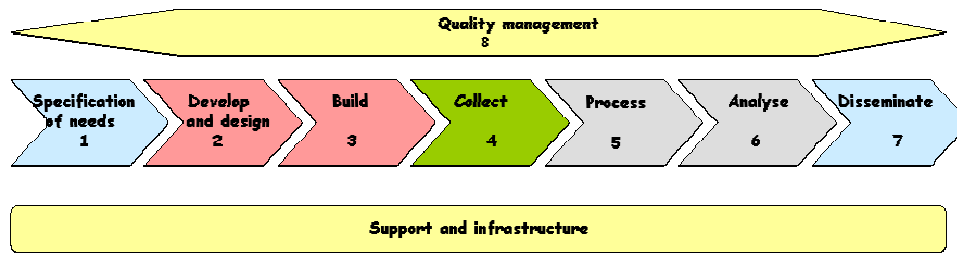
Job-specific capabilities are applied to specific roles, job groups and functions. Such capabilities are developed for Statistical and Methodological, Information Technology and Client and Corporate roles.

As the most critical set of Job-specific capabilities are considered the statistical capabilities which aligned to the Statistical Business Cycle are:

- a) Stakeholder Engagement
- b) Statistical Planning
- c) Methodology
- d) Collection Development
- e) Data Collection
- f) Processing
- g) Data Analysis
- h) Dissemination
- i) Decision Support
- j) Managing Quality and Processes

Other examples can be picked from documents from for instance Finland (ECE/CES/2006/14) or Sweden (ECE/CES/2006/30) presented at the same conference.

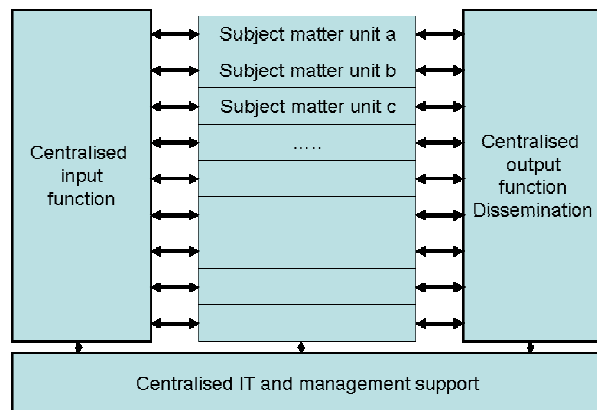
The job-specific capabilities as defined by ABS can related to the business model as specified for the standardisation programme (FOSS) of Statistics Norway. This process model was originally developed by Statistics New Zealand and is implemented in some other NSIs and also proposed by the UNECE secretariat as the basis for a common generic model at a seminar in April 2008 (Working paper No. 10):



Statistics Norway will continue working on specifying a framework for competence description as a basis for improved training and follow up, and will benefit from any exchange of ideas concerning solutions and approaches.

Organisational development and the needs for competences and training

One challenge also in relation to training is that when combining this business model with the present organisational chart, we see that the different process steps can be located in different places in the organisation. A schematic organisational chart can in principle look like this:



Thus one might imagine the following responsibilities in the different parts of the organisation:

Function	Subject matter unit	Functional support unit	Research unit
1. Specifications of needs	Main		Partly?
2. Develop and design	Main/partly	Main/partly?	
3. Build	Main/partly?	Main/partly?	
4. Collect		Main	
5. Process	Partly	Main	
6. Analyse	Main		Partly
7. Disseminate	Main/partly	Main/partly?	
8. Quality management	Main	Partly	
Support and infrastructure		Main	

We see that there are some roles that will have to be clarified in this type of organisation, which also will affect both recruitment and internal training of staff.

In this context it is worth noting some of the lessons learned in Statistics New Zealand when implementing a process-based approach (Working Paper No. 3, MSIS 2008). It is mentioned that there are several benefits, but that there are some side effects that have to be mitigated, for instance:

- Governance becomes more complex
- Increased challenge to find and retain skilled staff

Concluding remarks

Human resource management is a major challenge in a statistical agency, especially in a situation of changing technologies, organisation and working processes. An issue is also to what extent the national education system can provide the educational background that is relevant for the tasks of modern statistical system, and how supplementary competences and capabilities might be provided. Increased cooperation between national statistical institutes in the area of training, exchange of best practises and exchange of staff can be an important answer to these challenges. Some issues for further consideration are:

- To what extent is there a common business model for statistical production?
- What are the relationship between this business model, the organisational set up and the requirements for human resources and the competences required?
- To what extent has this business model consequences for the competence structure, for instance in relation to degree of specialisation, required background and internal training?
- To what extent can we share a common description of the required competences and capabilities of a statistical institute?
- How can we benefit from benchmarking and sharing best practice in the field of human resource management and organisational development?
- To what extent is it possible to develop an international labour market for experts in official statistics?

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