

Performance, quality, management

How statistical offices try to do better

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This paper is about three issues that are closely linked: performance measurement, benchmarking and quality management. Increasingly, national statistical offices want to know how they are doing, as well as to demonstrate to their constituencies that they are providing a good service at reasonable cost. In order to do that, performance has to be assessed and if possible measured through 'performance indicators'. Comparison with other agencies and statistical offices abroad, or against past performance (e.g. how long did it take to produce quarterly GDP numbers in 1995, compared to 2001) or against future objectives (e.g. in the year Y we want to produce and publish the CPI within 3 weeks after the reference period, and how much have we progressed) are possible ways to measure performance; this is generally called benchmarking. Finally, since quality (in a broad sense) is one of the essentials of official statistics, performance measurement and benchmarking are usually part of larger quality management programs.

While in the private sector performance has always been a given (in the longer run, non-performance means going out of business), performance in the public sector did not become a real issue until the seventies and eighties. Particularly since the eighties there has been increasing pressure on government budgets in many countries. Downsizing ('less government') and outsourcing became household words and simultaneously, the concept of privatisation came about. In various countries state-owned companies such as utilities, airlines, airports, telecom companies, railway companies etc. were privatised or sold off. Many government departments and institutions saw their budgets and staffs decreased. Statistical offices were no exception, as will be demonstrated later in this paper. All this meant that statistical offices (and other government agencies as well) were increasingly challenged to become more aware of performance, quality and, more in general, good management.

The structure of this paper is as follows. First, some general background information about performance measurement is given. Secondly, some specific examples of performance measurement and benchmarking outside the world of official statistics are given. Thirdly, various approaches to and examples of performance measurement and quality management in official statistics are described. Finally, some conclusions are offered.

Trends, techniques and fashions

Various techniques and approaches to better allocating government resources, prioritising and budgetary reductions have appeared and vanished. As early as 1949, the Hoover Commission proposed performance budgeting, President Johnson implemented a program planning budgeting system (PPBS), and the Carter Administration advocated a zero-based budgeting system. All of these efforts looked to better define government program objectives and to link program accomplishments to the means of achieving them.

PPBS and 'zero base budgeting' are burdensome techniques: every year government institutions had to argue in great detail and/or from scratch (zero) what they needed tax payers' money for. In The Netherlands, an experiment with 'performance budgeting' was organised in the eighties by the Ministry of Finance. The idea was to show to parliament (accountability!) what kind of outputs government institutions produced with the appropriations that they had received. Obviously, this is not always easy. Many governments departments and institutions have rather intangible outputs: policy documents, legislation, inspections etc. And how, for example, can one compare one piece of legislation with the next? Statistical offices (and some other kinds of government agencies) are different from general government departments in that they have a more or less tangible output: statistics, in the form of publications, databases etc. So Statistics Netherlands was targeted as one of the institutions to participate in the 'performance budgeting' exercise. A restricted number of 'performance measures' were selected, most of them 'outputs': number of statistical collections handled, number of publications, publication pages printed, number of copies sold, number of requests for information handled, number of visitors to the library. The system died after about ten years.

In the early nineties, Statistics Netherlands, on its own volition, decided to follow a different, more fundamental approach to demonstrate its valuable role for the Dutch society. This was the so-called TEMPO operation (see: Abrahamse, 1993), which was, guided by Ernst & Young management consultants, based on state-of-the-art, sophisticated approaches to performance measurement.

Background and terminology

What is Performance Measurement and why is it useful?

Performance measurement in the public sector can be defined as "a systematic attempt to learn how responsive a government's services are to the needs of society". Performance measurement is the public sector's way of determining whether it is providing a quality product at a reasonable cost.

In many cases, the terminology of performance measurement can be confusing. The language of performance measurement includes terms such as effectiveness, efficiency, outcomes, outputs, productivity, quality, and inputs. In one sense or another, all of these terms represent measures of performance, but each measures different aspects of performance. Some key definitions are:

- ❖ Inputs are the resources that an agency uses to produce services, including human, financial, facility, or material resources (e.g., money expended or tons of material used).
- ❖ Outcomes are the quantified results, or impacts, of government action. Progress is assessed by comparing outcomes to objectives through the use of measures. Outcomes are the effects -both intended and unintended- of the agency outputs on a particular population or problem area. Outcomes are not outputs: output is the quantity of a service or good produced; an outcome is the result, or impact, of the output.
- ❖ Outcome Measures are tools, or indicators, to assess the actual impact of an agency's actions. An outcome measure is a means for quantified comparison between the actual result the intended result.
- ❖ Outputs are the goods and services produced by an agency (e.g., number of students trained or miles of roads repaired).
- ❖ Output Measures are tools, or indicators, to count the services and goods produced by an agency. The number of people receiving a service or the number of services delivered are often used as measures of output.
- ❖ Efficiency Measures are indicators that measure the cost, unit cost or productivity associated with a given outcome or output.

The major purposes for performance measurement in the public sector revolve around the concept of enhanced accountability. The accounting firm of Price Waterhouse has identified three key advantages of using performance measurement:

1. Measurement clarifies and focuses long term goals and strategic objectives. Performance measurement involves comparing actual performance against expectations and setting up targets by which progress toward objectives can be measured.
2. Measurement provides performance information to stakeholders. Performance measures are the most effective method for communicating to legislatures and citizens about the success of programs and services. For example, in public education, states and school districts routinely issue "report cards" highlighting test score outcomes and other key indicators of educational performance. These have become centrepieces of attention among not only educators, but many other stakeholders.
3. Measures encourage delegation rather than "micro-management". Hierarchical structures and extensive oversight requirements can obstruct organisational effectiveness. Performance measures free senior executives for more strategic decision-making and selective intervention, while clarifying the responsibilities and authority of managers.

Normally, in the private sector, the market system forces companies to measure their performance and effectiveness. Failure to do so will result in the failure of a business to generate a profit, either in the short-term or the long-term. Competition for sales and profit creates real incentives to constantly monitor the utility and attractiveness of a private sector good or service. But in the public sector, these same market forces are

not in play. There are various reasons why market forces will not drive government to measure its performance:

1. Government cannot go out of business. Every citizen is a customer of government services, and new customers are born all the time.
2. Government controls its revenue. If more money is needed for services, government can and does raise taxes. There is no relationship between the quality of the product and the desire of its customers to have the product.
3. Government is allowed to spend more than it takes in. Even in governments which require a balanced budget, officials attempt to circumvent the requirement through debt, deferring capital expenditures, and creative bookkeeping.
4. Government delivers "essential services". Every service offered by government has a constituency who believes that service is essential. Non-essential services in many cases have already been eliminated to keep costs in line with citizen expectations.

What Forces Are Driving Performance Measurement?

If the very nature of government fails to create incentives for performance measurement, why is measuring performance so attractive to government officials? What creates a motivation to move in the direction of accounting for performance? In an era in which revenues are growing much slower than the demand for expenditures and programs, governments are forced to make tough decisions about priorities. A greater consciousness of tax burdens and policy has resulted in a desire to not only prioritise services based on need and demand, but also to assure that the resources put into services are used to the best advantage. Citizens and voters demand greater accountability for the resources they commit to government. They insist on objective data to prove or disprove the worth of government programs. While disgruntled customers of government services may not be able to choose another provider, they can make changes in the leadership of their government organisations. These types of accountability issues are the major forces behind the movement toward measuring performance.

Developments in the United States

As with management philosophy and management techniques in general, most performance measurement thinking was born in the United States. These are some developments in 'reinventing American government' that took place over the last decade.

“. . . chart a course for every endeavour that we take the people's money for, see how well we are progressing, tell the public how we are doing, stop the things that don't work, and never stop improving the things that we think are worth investing in.” (President William J. Clinton, on signing the Government Performance and Results Act of 1993.)

To help agencies respond to this new challenge, Vice President Gore's National Performance Review (NPR) has assembled a group of process experts to identify how some of the best organisations, public and private, are implementing results-oriented

performance measurement and performance management. In this first-ever intergovernmental benchmarking study, the processes, skills, technologies, and best practices were identified that can be used by government to link strategic planning with performance planning and measurement by:

- ❖ Establishing and updating performance measures;
- ❖ Establishing accountability for performance;
- ❖ Gathering and analysing performance data; and
- ❖ Reporting and using performance information.

This effort was championed by the President's Management Council, which is made up of the Deputy Secretaries and their equivalents in the major federal agencies. The present performance measurement benchmarking study builds on and extends the findings contained in the February 1997 NPR report *Serving the American Public: Best Practices in Customer-Driven Strategic Planning*. Further, the best performance measurement and management systems and practices work within a context of strategic planning that takes its cue from customer needs and customer service.

A report of the National Performance Review, chaired by former Vice President Al Gore, focuses heavily on the need for better performance measurement at the federal level. The report has caused a reemphasis, but not a new birth. Performance measures have been used in a limited way in the federal government structure for several years. The Government Accounting Standards Board (GASB), the developer of accounting standards for financial reporting in states and local governments, adopted a concept statement in 1987, which states that financial reporting should provide information to assist users in assessing the service efforts, costs, and accomplishments of the government entity.

Since that time, GASB has conducted significant research in the area of service efforts and accomplishments, and is now developing specific standards for performance measurement requirements for annual reports of all state and local governments in the United States. In the best-seller, *Reinventing Government*, special emphasis is given to developing "results-oriented" governments. The authors argue that "if you don't measure results, you can't tell success from failure." The implication is that for better decision making, accountable management, and motivation of managers, performance must be measured. Some of the slogans of the book are:

- ❖ If You Don't Measure Results, You Can't Tell Success From Failure
- ❖ If You Can't See Success, You Can't Reward It
- ❖ If You Can't Reward Success, You're Probably Rewarding Failure
- ❖ If You Can't See Success, You Can't Learn From It
- ❖ If You Can't Recognise Failure, You Can't Correct It
- ❖ If You Can Demonstrate Results, You Can Win Public Support

Principles of a Performance Measurement System

The tasks of allocating resources and assuring effective services at reasonable cost are significantly facilitated by the availability of meaningful and accurate performance information. The development of an enhanced measurement system is based on the following principles:

- ❖ That the measurement system be Results-Oriented: Focus principally on outcomes and outputs.
- ❖ That the measurement system be Selective: Concentrate on significant indicators of performance.
- ❖ That the measurement system be Reliable: Produce data that are accurate and consistent over time.
- ❖ That the measurement system be Useful: Provide information which is valuable to both policy and program decision-makers.
- ❖ That the measurement system be Accessible: Ensure the periodic and systematic disclosure of results achieved through agency efforts.

Clearly, the overall value of a measurement system is dependent upon the quality of individual measures. Focusing more on the results than effort will require significant changes in the way we do business. The use of outcome, output, input, and efficiency measures are integral to assessing agency performance in achieving stated goals, objectives, and strategies. Because of the need to clearly establish what is being shown by a measure and to document for audit purposes the calculations upon which reported performances is based, measure development must necessarily include an easy-to-understand, detailed definition of each measure. The following section more clearly defines each of the components of a performance measurement system and provides development guides for each step in the process.

Mission, goals, objectives, strategies

Performance measurement ideally starts with the formulation of a vision of the mission of the organisation and a strategy on how to achieve the objectives of the mission.

The *mission* describes the overall role of the agency as it relates to society as a whole and is the common thread binding the agency's organisational structure and its activities. The mission of the agency may link several functional areas depending on the unique nature of the agency. All agency employees should be able to identify their specific working relationship to this defined mission. The mission must be clearly understandable to the public and should at a minimum answer the following questions:

- ❖ Who are we as an organisation and whom do we serve?
- ❖ What are the basic purposes for which we exist, and what basic actions are we established to accomplish?
- ❖ What makes our purpose unique?
- ❖ Is the mission in harmony with the agency's enabling statute?

A mission succinctly identifies agency purposes, distilling from enabling statutes or constitutional provisions the most important reasons for an agency's work. In developing the mission, agencies should also examine other relevant sources, e.g., board policies and program descriptions. The mission should generally be no more than one or two sentences in length.

The development of agency goals is one of the most critical aspects of the strategic planning process. Goals chart the future direction of the agency. The goal development process begins to focus the agency's actions toward clearly defined purposes. Within the scope of the stated mission and utilizing the external/internal assessment, goals specify where the organisation desires to be in the future. Goals are issue-oriented statements that reflect the realistic priorities of the agency.

Goals should be client-focused, address the primary external and internal issues facing the organisation, and be easily understood by the public. Although there is no established limit, the number of goals the agency may develop should be kept to a reasonable number in order to establish the agency's direction and provide a unifying theme for programs and activities. They are shown in the strategic plan in an approximate priority order, beginning with those of the greatest importance and impact. During goal development, the agency should begin identifying performance indicators to measure accomplishment. The formation of agency goals should include, but is not limited to, an analysis of the following questions:

- ❖ Are the goals in harmony with the agency's mission and philosophy statements and will achievement of the goals fulfil or help fulfil the agency's mission?
- ❖ Are the goals derived from an internal/external assessment and do they reflect responses to customer needs?
- ❖ Do the goals provide a clear direction for agency action?
- ❖ Are the goals unrestricted by time? Do they reflect agency priorities?

In contrast to goals, which are broad general statements of long-range purposes, *objectives* are specific, quantified, and time-based statements of accomplishments or outcome. Objectives represent the extent to which agency goals will be achieved at the end of the time period covered by the strategic plan. An agency's objectives should be derived directly from its stated goals which imply a priority for resource allocation. Objectives emphasise the results the agency is aiming to achieve. Outcomes are tied directly to objectives.

The development of objectives aids decision-making and accountability by focusing on issues and the accomplishment of outcomes. They should clearly quantify the specific results the agency seeks to achieve during implementation of the plan and should be easily understood by the public. A focused external/internal assessment is necessary to establish objectives. The formation of agency objectives should include, but is not limited to, an analysis of the following questions:

- ❖ Does each objective describe an outcome in terms of specific targets and time frames? Is each objective realistic and attainable?
- ❖ Do the objectives relate to results or outcomes instead of internal processes?

- ❖ Are the objectives logically connected to a particular goal and the external/internal assessment?

Although no limit is set, there must be at least one objective for each stated goal. They are shown in the strategic plan in an approximate priority order, beginning with those of greatest importance and impact. Generally, each objective should be no more than two sentences in length.

Strategies are specific courses of action that will be undertaken by the agency to accomplish its goals. While goals indicate what the agency wants to achieve, strategies indicate how those goals will be achieved. Strategies are action-oriented rather than procedural in nature and are directly linked to output measures. To develop strategies, the agency determines how best to achieve the results intended by the goals. More than one strategy may be needed for accomplishing each goal. In choosing strategies, the costs, benefits, and anticipated consequences of alternative courses of action must be evaluated by the agency. Strategies may, and probably will, cross programs, activity, or division lines. Questions to consider in developing strategies include, but are not limited to, the following:

- ❖ If this strategy (or strategies) is (are) implemented, can we assume that the goal will be reached?
- ❖ What are the anticipated costs and benefits of each strategy?
- ❖ Do we have the authorisation to take the action outlined in each strategy? Is it legal and practical action?
- ❖ Do we have the necessary resources to implement this strategy (or strategies)?

Strategies must be easily understood by the public and should be generally no more than two sentences in length.

Performance measures are tools or indicators of the success in achieving a given goal or objective. Performance measures can generally be divided into output measures, outcome measures, input measures, or efficiency measures.

- ❖ Outputs are the goods and services produced by an agency. Output Measures are the tools, or indicators, to count the services and goods produced by an agency. The number of people receiving a service or the number of services delivered are often used as measures of output.

In developing and selecting key output measures, the following questions should be addressed:

- ❖ Is the output reliably measurable? Will it measure the same thing over a period of time? Will the data used in the measure be available on a continuing basis?
- ❖ Is the output measure directly related to the agency's strategies?
- ❖ Does the output measure show the quantity of work performed? Can the measure be stated in unit cost terms?
- ❖ Is the output measure clear? Are the terms used generally accepted and defined? Will the measure be easily understood by those who are not familiar with the subject?

Some examples of performance indicators outside the world of official statistics

Here are some specific, randomly selected examples of how organisations go about the measurement of performance.

1. The *National Health Service Executive* (United Kingdom) uses several categories of input, process, output and efficiency measures to monitor its performance, e.g. the development over time of:
 - deaths from cancer
 - suicide rates
 - early detection of cancer
 - childhood immunisations
 - maternity unit costs
 - cancelled operations
 - patient satisfaction, etc.
2. To monitor the state of the marine environment and its own performance in protecting/improving that environment, *New Zealand's Marine Environment* uses a broad range of indicators, varying from data about marine spills, sedimentation, % of area under protection, time not suitable for bathing or shellfish gathering, fish stocks, etc.
3. *Intel* (USA) measures the performance of its various Pentium and Celeron processors in terms of:
 - Video editing
 - 3D gaming
 - Video encoding
 - Speech recognition
 - Internet, etc.

and compares this performance with certain industry benchmarks, such as WebMark 2001. This is a new benchmark for evaluating Internet performance from a user's perspective. Internet access is a requirement for most businesses and a driving force behind consumer PC purchases today, yet no comprehensive metric exists for understanding how the client computer and the speed of the connection will affect the overall Internet experience. WebMark will address the need for a broadly deployed, industry standard benchmark that can record and report Internet performance for businesses and consumers alike.

4. Although it may often be useful, performance indicators do not necessarily have to be quantitative. *The Scottish Office* (United Kingdom) e.g. has introduced the HGIOS (How Good Is Our School) system for self-evaluation using (mainly qualitative) performance indicators, such as answers to questions like:
 - How well is the school managed?
 - What are the school's key strengths?
 - How have we involved people (incl. parents, etc.) ?

5. To evaluate the performance of the power sector in countries, the *World Bank* uses a combination of various qualitative and quantitative measures and indicators, such as:
- Existence of an electricity law
 - Share of private sector in power generation
 - Total annual losses (technical and non-technical)
 - Average tariff c/kwh
 - Electricity consumption per capita
 - Number of consumers per employee
 - Km of transmission line, etc. etc.

All these values are compared (benchmarked) against past and present values, target values and comparative values for the region (average or typical, and best).

6. An example of benchmarking many people are familiar with is the comparison of durable consumer goods (e.g. computers, cameras, refrigerators etc.) against market leaders and other competitors. Annex I shows an example of the performance indicators used for passenger cars.

Examples of performance measurement, quality management and benchmarking in the world of official statistics

Conferences on quality and related issues

Quality and performance have been very much in the limelight in official statistics lately. First of all, mention should be made of several recent conferences on quality.

- International Statistical Institute (ISI) : the 53rd Session of ISI (Seoul, Korea, August 22-29, 2001). The "Invited Paper Meetings" include a session on Quality Programs in Statistical Agencies, organised by Gordon J. Brackstone, Canada, and including papers detailing approaches to data quality by national and international statistical offices (session IPM12). For the program, see: <http://www.nso.go.kr/eindex.html>
- Symposium 2001 is a conference on achieving data quality in a statistical agency from a methodological perspective. The conference is sponsored by Statistics Canada and will take place on October 17-19, 2001 in Ottawa, Canada. The conference will focus on methods to meet the challenges of data quality, especially from the perspective of data accuracy. Information about the conference can be obtained from the website at www.statcan.ca/english/conferences/symposium2001
- The International Conference on Quality in Official Statistics took place in Stockholm, Sweden on May 14-15, 2001. The conference brought together papers that represent the current thinking on quality issues in the field of official statistics. Papers were presented on a variety of topics including quality management models, the concept of quality, and measuring quality. The papers have been posted on the website at www.q2001.scb.se

- Statistical Quality Seminar 2000 took place on Cheju Island, Republic of Korea on December 6-8, 2000. The seminar was co-sponsored by the International Monetary Fund and the Korean National Statistical Office. The seminar covered a broad range of issues related to data quality, including trends and approaches to statistical quality assessment and national experiences in assessing and improving the quality of official statistics. A summary of the seminar discussions is available in the January 8, 2001 issue of the IMF Survey, available on the Internet at the IMF website
- Papers of the Cheju conference can be accessed at the seminar website at www.nso.go.kr

The following are examples of various approaches to quality management and performance in statistical offices. Some examples are very specific to statistics, others are of a more generic nature.

1. Qualitative approaches

Performance measurement against the Fundamental Principles

The rankings (league tables) of national statistical offices, published by the newspaper The Economist (1991 and 1993) were primarily based of the timeliness and accuracy of some major statistical series, as well as judgements of chief government statisticians about the objectivity of statistics (in terms of absence of political interference), reliability of the numbers, the statistical methodology that was applied and the relevance of the published figures. There was little discussion about the criteria The Economist had used, even though there was fairly broad agreement that the assessment had been somewhat superficial.

A more comprehensive, systematic evaluation of national statistical offices/systems was proposed by De Vries (1998). It is mainly based on the so-called Fundamental Principles of Official Statistics. 25 key questions are raised and by answering those, statistical offices would be able to 'measure' how well they were doing. The question has been raised, and rightfully so, whether this approach ultimately produces real indications about which are 'good' or 'better' statistical systems. A statistical system that scores high on 'the 25 indicators', it is argued, may have a high ethical and professional standard and may do its very best in many ways, but is there any guarantee that it produces good, relevant, timely statistics? The answer to that question would probably be: no, but nevertheless it is likely that there is a high positive correlation between scoring well on 'the indicators' and being a successful system in terms of output.

To illustrate this approach, here are the questions relating to Principle 1 (Relevance, impartiality and equal access):

1. How well developed are mechanisms to ensure that statistical work programs are relevant for the various user groups?
2. How satisfied are users with statistical products and their dissemination?

3. How well do national statistical offices adhere to their obligation of impartiality?
4. How well are statistical offices shielded from political intervention as to the content and the release of statistical results?
5. How well is the principle of 'equal access under equal conditions' adhered to?

Internal peer reviews

In the framework of its Businessplan CBS 2000, Statistics Netherlands introduced the concept of a Quality Framework, as well as a system of internal peer reviewing, called 'statistical auditing' to monitor compliance with this framework.

Each statistical project will be submitted to an auditing exercise every five years, including a follow-up to see whether deficiencies have been corrected. (see: De Vries & Van Brakel, 1998)

The main aspects covered by the Quality Framework are:

- 1. purpose of the statistical collection
- 2. the survey design
- 3. data input
- 4. data throughput
- 5. data output

1. The purpose of statistical collections

- Who are the most important internal and external users of the statistics?
- When have they last been consulted about their needs?
- What are their needs as to: detail of variables, levels of aggregation, periodicity, coverage, comparability with other statistics, timeliness, accuracy etc.
- What is the real value of the statistics in relation to what the users would want?
- Which user needs cannot be met?
- What may be done to improve this situation?

2. The survey design

- Is the survey design documented?
- Are the statistics based on data collection 'in the field' or on integration of existing data sources?

About data collections:

- What type of sampling (if any) is applied and why?
- Which sampling frames are used?
- To what extent is the sampling frame complete and up-to-date?

- Does the frame contain the right kind of statistical units?
- How do you cope with imperfections in these respects?
- In what form are the data collected ? (EDI, mail in-mail out questionnaires, interviewing etc.)

About data sources:

- Which data sources are used?
- Are there any alternatives and why are they not used?

About the structure of questionnaires:

- Have questions been tested for clarity? Are they answerable?
- Are questions assessed on validity?

3 and 4. Data input and throughput

Input planning and procedures

- Is there a planning for the different phases of the statistical process?
- How is the input process organized and monitored?
- Have any efforts been made to optimize the input and throughput process?
- Are there documented procedures for non-response treatment, imputation, data editing, raising, estimation, cross-checking between data?
- For integration processes: is the relation between statistics and their sources documented?
- For data editing: are all questionnaires checked/cleaned individually and if not, what are the criteria for selection?
- How are sampling frame errors treated?
- About imputation: how are non-response gaps filled?
- About weighing and raising: are intermediate results calculated and how are they used?
- How are statistics matched with other numbers and time series?

5. Output

- Does the final product meet the users' needs?
- Are there any differences with other, related NS statistics and what has been done to minimize the differences?
- Are analyses about differences well documented and publicly available?
- Are efforts made to avoid misinterpretation of the statistics?
- How is the quality of the statistics presented to the users?
- Is a complete quality description available for the users?
- What is exactly known about non-sampling errors? Is this knowledge well documented?

To obtain experience with statistical auditing, two pilots were carried out in 1996. One was about the statistics on Performing Arts, the other about statistics of the Transport industry. The aim of the pilots was to better define the scope of future regular audits and to develop a set of rules on procedures and instruments. The pilot audits were done by two teams of three SN-staff each. A private consulting company, which had broad experience in auditing and quality management, was commissioned to train the auditors and to moderate the process. Auditors were selected by the Audit secretariat on the basis of their statistical and managerial qualities. The techniques applied during the audits were interviews on the one hand and analysis of documentation on the other. The findings of the audits and the recommendations made on the basis of these findings were laid down in reports.

As to the selection of auditors, the idea was that all audits would have to be done by own SN-staff. The aim was to create a 'pool' of about 25 auditors from various divisions, selected on the basis of their expertise, but also their personality. The auditors were supposed to come from various divisions to ensure that a variety of experiences and expertise is represented in the audit teams. The auditors do this work on a part time basis only, because the idea was to keep them involved in regular statistical activities as well. The disadvantage of full-time auditors would be that such people may 'lose touch' with current practices and new developments. Ideally, an audit team consists of one person who is a specialist in statistical methodology, one who is well versed in statistical organization aspects and one who has a special affinity with producing outputs. In addition, some of the qualities looked after are:

- good communicative skills at various levels; diplomatic skills
- good analytic qualities
- openness for change
- knowledge of statistical processes
- good editorial qualities and the ability to present results orally

External peer reviews

In the framework of an overall reorganisation exercise, the Swiss Federal Statistical Office (SFSO) invited senior statisticians from Canada to undertake a 'peer review' of the Swiss statistical service (see; SFSO, 2000). The scope of the review was to identify the strengths and weaknesses of the system, compared with acknowledged models and standards, as well as to elaborate proposals for improvement.

The reviewers looked at the following aspects:

- Legal basis
- Institutional framework, including relations with the user community and relations with other bodies of the Swiss administration
- Core values of Swiss government statistics, including credibility and independence
- Priority needs and activities, including planning mechanisms
- Co-ordination of statistical activities

- Structure of the Federal Statistical Office

Basically, the reviewers tries to ascertain three things:

- That the SFSO calculates its numbers correctly
- That the SFSO does not waste resources measuring things that few wish to know, but rather that what it does is helpful for public debate, to assist the government in making decisions and to provide a sound basis for economic and social insight
- That the SFSO uses the most appropriate methods in the performance of its tasks.

2. *Quantitative approach*

Benchmarking on cost

In 1999, the Dutch government and the parliament asked Statistics Netherlands to do a summary cost comparison exercise (see: De Vries, 1999). The underlying question was whether Statistics Netherlands was big and costly, compared with similar organisations in other countries. It is, of course, difficult to answer this question with any degree of precision, because countries and statistical systems are very different (centralised or decentralised, coverage of work programme, economies of scale, administrative and statistical infrastructure, special responsibilities of statistical offices, e.g. economic analysis).

For practical reasons, the comparison was restricted some larger and medium-sized, economically developed countries, which have a statistical system that is generally considered to be good or adequate. Besides The Netherlands, eight countries were considered, including six European countries: Sweden, Finland, Denmark, France, Germany, the United Kingdom, and outside Europe Canada and Australia.

The table below compares some indicators for the nine countries mentioned, in particular inhabitants and number of ‘official statisticians’, as well as increase/decrease of that number over a certain time period, and government spending on official statistics, related to GDP (1998).

	Inhabitants (mln)	Stat. (year)	Stat. 1998	+/- (%)	Stat. mln/inh	Expenditure (% GDP)
Canada	27	6200(88)	7200	+16	267	0.04
Australia	17	3800(83)	3800	0	224	0.04
Finland	5	767 (83)	915	+19	183	0.036
France	60	9841(85)	9337	-5	156	0.024
Netherlands	16	3500(83)	2400	-31	150	0.037
Germany	75	9300(83)	11041	+19	149	0.025
Sweden	9	1555(83)	1084	-30	144	0.034
Denmark	5	635 (85)	660	+4	132	0.025
UK	56	6502(83)	4560	-30	82	0.019

Expenditure in % of GDP is based on gross budgets. The share of 'own' income that statistical offices may have (sales of publications, specially financed projects) as a rule varies from 10-20% of the overall budget (in the case of Statistics Netherlands it is about 10%).

Germany: The increase in the number of statisticians between 1983 and 1998 is mainly a result of the re-unification of Germany.

United Kingdom: The recent history of British statistics has been turbulent. In the Thatcher period severe budget cuts were implemented, based on the philosophy that official statistics were to serve government interests only. Later on this policy was partly reversed. In addition some major mergers of statistical offices took place. This makes comparisons over time rather difficult. However, it would seem that official statistics in the UK are remarkably inexpensive.

Canada: The increase of staff between 1988 and 1998 is partly due to new statistical work to support the redistribution of VAT between some Canadian provinces. This involves some 700 staff. Excluding this effect, the number of statisticians per million inhabitants for Canada would be 237.

France: The numbers include the Départments d'Outre-Mer (Overseas Departments). In addition to production of statistics, INSEE is also charged with economic analysis. It is difficult to say precisely how many staff are engaged in this work, but 200 would seem to be a fair estimate.

As to the Scandinavian countries: in Sweden, Finland and Denmark a substantial part of official statistics (80-90%) is compiled on the basis of register information. In The Netherlands this part is estimated at 60%. In Sweden, official statistics are financed in a rather unusual way: instead of on the basis of a central budget, a substantial part of the program (40-50%) is financed on the basis of 'contracts' that Statistics Sweden has to agree with other agencies. This makes comparison of expenditure difficult.

The main conclusions of the exercise were:

1. Compared with some other countries, the ratio statisticians/inhabitants and statistical expenditure/GDP, i.e. the cost level of Dutch statistics is 'average'. In some countries (which, by the way, have excellent statistical systems), statistics are clearly more expensive.
2. Of all countries in the comparison, the costs of Dutch statistics have been reduced most over the last ten to fifteen years. Only Sweden and the United Kingdom have experienced similar developments.

3. Mixed and integrated approaches

SDDS and GDDS (IMF)

Without doubt the most important international initiative to promote quality and quality standards in statistics has been the International Monetary Fund's Data Dissemination Standards.

The Special Data Dissemination Standard (SDDS) was established by the IMF to guide members that have, or that might seek, access to international capital markets in the provision of their economic and financial data to the public. Both the General Data Dissemination System (GDDS) and the SDDS are expected to enhance the availability of timely and comprehensive statistics and therefore contribute to the pursuit of sound macroeconomic policies; the SDDS is also expected to contribute to the improved functioning of financial markets.

Subscription to the SDDS was opened in early April 1996 by a letter from the IMF's Managing Director to all IMF Members and Governors. Although subscription is voluntary, it carries a commitment by a subscribing member to observe the standard and to provide certain information to the IMF about its practices in disseminating economic and financial data. A member country's subscription, which can be made at any time, is to be communicated in writing to the Secretary of the IMF. To date, there have been 48 subscriptions to the SDDS.

The SDDS, in taking a comprehensive view of the dissemination of economic and financial data, identifies four dimensions of data dissemination:

- The data: coverage, periodicity, and timeliness;
- Access by the public;
- Integrity of the disseminated data; and
- Quality of the disseminated data.

For each of these dimensions, the SDDS prescribes two to four monitorable elements--good practices that can be observed, or monitored, by the users of statistics. The data dimension lists 18 data categories that provide coverage for the four sectors of the economy, and it prescribes the periodicity (or frequency) and timeliness with which data for these categories are to be disseminated. In recognition of differences in economic structures and institutional arrangements across countries, the SDDS provides flexibility. Certain categories are marked for dissemination on an "as relevant" basis. Further, some data categories or components of data categories are identified as encouraged rather than prescribed. With respect to periodicity and timeliness, a subscribing member may exercise certain flexibility options while being considered in full observance of the SDDS. The monitorable elements of the SDDS for access, integrity, and quality emphasise transparency in the compilation and dissemination of statistics.

To support ready and equal access, the SDDS prescribes (a) advance dissemination of release calendars and (b) simultaneous release to all interested parties.

To assist users in assessing the integrity of the data disseminated under the SDDS, the SDDS requires (a) the dissemination of the terms and conditions under which official statistics are produced and disseminated; (b) the identification of internal government access to data before release; (c) the identification of ministerial commentary on the occasion of statistical release; and (d) the provision of information about revision and advance notice of major changes in methodology.

To assist users in assessing data quality, the SDDS requires (a) the dissemination of documentation on statistical methodology and (b) the dissemination of component detail, reconciliation with related data, and statistical frameworks that make possible cross-checks and checks of reasonableness.

Consistent with this comprehensive view of data dissemination, dissemination itself is broadly defined to include electronic dissemination in addition to the more traditional formats.

A formal transition period for the implementation of the SDDS began with the opening of subscription in early April 1996 and ended on December 31, 1998. During this period, a member could subscribe to the SDDS even if its dissemination practices were not fully in line with the SDDS at that time. This period gave subscribers time to adjust their practices, according to a plan (referred to as a transition plan), to bring them into line with the standard. During the transition period, the IMF also elaborated more fully certain operational aspects and reviewed the content and procedures of the SDDS with a view to making any adjustments needed in the light of experience.

A subscriber is expected to submit information about its data and its dissemination practices--its metadata--to the IMF for presentation on an electronic bulletin board. Subscribers' metadata are reviewed by the IMF for comprehensiveness and international comparability. The responsibility for the accuracy of the metadata, including timely updates, and for the economic and financial data underlying the metadata rests with the subscriber. In addition, subscribers are required to certify the accuracy of all metadata posted on the DSBB on a quarterly basis.

CBS Netherlands 2000 Business Plan

Here are some examples of qualitative and quantitative performance targets that Statistics Netherlands set out in its 'strategic plan' for the 1996-2000 period.

- Reduction of reporting burden for businesses by 12.5%
- Increase in sales of printed publications by 20%
- Increase of turnover in customized products by 40%
- Better press coverage: 60% of press releases should be taken up by national press
- Improvement in response in household surveys by 8 percentage points
- Establishment of a Quality Framework in 1998
- Implementation of an empowerment program to increase internal and external mobility of staff

3. Generic quality management systems

While it is very difficult to do justice to TQM and ISO in a few paragraphs, these systems have to be mentioned, if only because there are some national statistical offices that have implemented either system. ISO is a quality system that focuses mostly on business processes. TQM is a broader approach to quality.

Total Quality Management (TQM)

The very name of this approach illustrates its level of ambition. Total Quality Management, or TQM, is an American perception of managing quality. Total Quality Control (TQC), its predecessor and competitor, developed in Japan in the sixties, defines seven stages of quality. In order of increasing level of quality, they are:

- product oriented
- process oriented
- systems oriented
- humanistic
- society oriented
- cost oriented and
- quality function deployment (QFD).

The literature of TQM focuses largely on management and management techniques. A definition of 'total quality' is that it is the concept by which organisations use all the resources available to them, build long-term relationships with both employees and customers and remain open to ways in which processes can be improved for more efficient operation. According to some management gurus, American TQM, is now at the stage of a fuzzy perception of what quality really is and that it has an even fuzzier perception of how and where to implement it. From the perspective of competitive advantage, the first challenge for TQM is to holistically define the nature of quality and then rigorously implement procedures and guidelines on how to attain the defined quality.

ISO 9002

ISO 9001, ISO 9002 or ISO 9003 are the three quality assurance models of the International Standards Organisation (ISO) against which organisations can be certified. The difference between the three is simply one of scope.

- ISO 9001 sets out the requirements for an organisation whose business processes range all the way from design and development, to production, installation and servicing;
- for an organization which does not carry out design and development, ISO 9002 is the appropriate standard, since it does not include the design control requirements of ISO 9001 – otherwise, its requirements are identical;

- ISO 9003 is the appropriate standard for an organisation whose business processes do not include design control, process control, purchasing or servicing, and which basically uses inspection and testing to ensure that final products and services meet specified requirements.

So, an organisation chooses that its quality system be certified against ISO 9001, ISO 9002 or ISO 9003 according to the business processes covered by the quality system. There is no difference of quality ranking between the three standards. A couple of national statistical offices have chosen to be certified against ISO 9002.

Some conclusions

1. Like other government institutions, statistical offices are increasingly challenged about their performance and the quality of their products. Therefore, performance measurement and quality management has become important issues.
2. Performance measurement should ideally be embedded in broader approaches to improve the organisation, because which performance measures to choose depends largely on the objectives that the organisation has set for itself.
3. Which approach to take to quality management depends very much on the nature (size, structure, tradition, organisational form, management style) of the organization. Some form of TQM is probably not a bad choice.
4. A qualitative assessment of performance against the Fundamental Principles for Official Statistics may be an interesting exercise, even more so because it is relatively easy to do.
5. Benchmarking, particularly against statistical offices in other countries, is an interesting approach as well, because it is often not easy to compare statistical offices with other types of organisations nationally. Experience shows, however, that this is difficult, because statistical offices are often not very good at measuring themselves.

Epilogue: how to get better comparisons?

As I have mentioned before, I think that statisticians are not very good at and/or not really interested in measuring themselves and definitely not at measuring themselves in a way that makes comparisons across countries easy. Over the last fifteen years or so I have been involved in various comparison exercises of this kind and most of them have been complete failures. In the eighties we tried to compare the costs of external trade statistics and the consumer price index between a few countries in Europe and after some time the effort was aborted, because it was too difficult and too time-consuming. Eurostat and a Eurostat working party have tried for many years now to make cost-benefit comparisons between (certain specific products of) statistical offices of the European Union member states. Clearly, benefits of statistics are a very difficult thing to measure, but even as far as cost is concerned, the results so far are practically nil, one of the main reasons being that the experts involved could not agree on definitions and various measurement issues.

The latest development here is that a final effort will be made to go on with cost comparisons (and forget about benefits). Another example is the Mahalanobis Committee, created by the International Statistical Institute in 1995. Its aim was to develop some 'statistics about statistics'. So far there are no results, the reasons being on the one hand a total lack of interest to participate in the work of the committee, and on the other hand a lot of disagreement about how to tackle the issue. The most recent important initiative that I know of was taken by the Australian Bureau of Statistics, which invited some sister agencies (including Statistics Netherlands) to participate in a benchmarking exercise on the cost and quality of some sets of statistics. At this stage it is too early to say whether the ABS exercise will work.

I believe it is obvious that governments will go on asking statistical offices about their performance and efficiency, compared to statistical offices abroad. Therefore, but no less because it is worthwhile for statistical offices themselves to know how cost-effective colleagues in other countries are doing their work, I think the international statistical community would be well advised to make a real effort to improve their performance and cost-accounting measurements, and try to do so in an internationally comparable manner. Perhaps there is a challenge here for the Conference of European Statisticians or indeed the United Nations Statistical Commission.

After all, I think there is some irony in the fact that statisticians are trying to agree in great detail what internationally comparable information (definitions, classifications, other measurement methodology etc.) to ask from businesses, institutions and households, and would not wish to agree on the measurement of their own operations (and seem to be unable -so far- to agree on universally accepted definitions of concepts such as, say, non response or, indeed, statistician).

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- International Standards Organisation Internet site
- United Nations Statistics Division Internet site

Annex I Benchmark comparison of two popular small passenger cars

2001 Toyota Corolla S	2001 Dodge Neon Sedan	
Pricing:		
Equipped Price	\$12,793	\$14,555
Destination Charge	\$455	\$490
Total Equipped Price	\$13,248	\$15,045
Anti-Theft & Locks:		
Power Door Locks	Optional	Included
Vehicle Anti-Theft	Optional	Included
Braking & Traction:		
ABS Brakes (2 or 4 Wheel)	Optional	Optional
Traction Control	Not Available	Optional
Engines & Emissions:		
Engine, 4 Cylinder	Standard	Standard
Entertainment, Communication & Navigation		
Cassette Player	Optional	Standard
CD Changer	Optional	Optional
CD Player	Optional	Optional
Radio	Standard	Standard
Exterior Lighting:		
Fog Lights	Standard	Selected Feature
Headlights Automatic On/Off	Standard	Not Available
Heating, Ventilation & Air Conditioning		
Manual Air Conditioning	Optional	Included
Instrumentation:		
Cruise Control	Optional	Optional
Remote Controls & Remote Releases:		
Keyless Entry (Remote Lock/Unlock)	Not Available	Included
Safety:		
Front Side Airbag	Optional	Optional
Seats:		
Front Bucket Seat	Standard	Standard
Leather Seat	Not Available	Optional
Steering:		
Tilt Steering Column	Optional	Not Available
Storage:		
Load Bearing Exterior Rack	Optional	Optional

Sunroof/Moonroof & Removable/Convertible Top:		
Sunroof/Moonroof	Optional	Optional
Transmission:		
Automatic Transmission	Optional	Optional
Manual Transmission	Standard	Standard
Wheels & Tires:		
Alloy Wheels	Optional	Optional
Full Size Spare Tire	Not Available	Optional
Windows, Mirrors & Wipers		
Heated Exterior Mirror	Not Available	Included
Power Adjustable Exterior Mirror	Optional	Included
Power Windows	Optional	Included
Engine Data:		
Standard Engine	1.8L I4	2.0L I4
Displacement (CI)	109	122
Displacement (CC)	1794	1995
Bore X Stroke (Inches)	3.11X3.60	3.44X3.27
Compression Ratio	10.0	9.8
Horsepower (bhp)	125	132
Torque (Ft/Lb)	125	129
Fuel System	Electronic Fuel Injected	Sequential Electronic Fuel Injected
Handling Data:		
Steering Diameter (Left)	32.2	35.5
Steering Diameter (Right)	32.2	35.5
EPA Fuel Economy (City)	32	27
EPA Fuel Economy (Highway)	41	33
Manual Transmission	Standard	Standard
Automatic Transmission	Optional	Optional
Engine Location	Front	Front
Driveline	Front Wheel Drive	Front Wheel Drive
Brakes (Front)	Disc	Disc
Brakes (Rear)	Drum	Drum
Steering	R&P	R&P
Suspension (Front)	Independent	Independent
Suspension (Rear)	Independent	Independent
Standard Tire	185/65R14	185/65R14
Vehicle Specifications:		
Body Style	Sedan	Sedan
Curb Weight (Manual Trans.)	2405	2585
Curb Weight (Automatic Trans.)	2485	2635
Wheelbase (Inches)	97.0	105.0

Front Track (Inches)	57.5	58.0
Rear Track (Inches)	57.1	58.1
Length (Inches)	174.0	174.4
Width (Inches)	66.7	67.4
Height (Inches)	54.5	56.0
EPA Cargo Volume (Cubic Ft)	12	13
Fuel Capacity (Gal)	13.2	12.5
Standard Seating	5	5
EPA Classification	Compact Car	Compact Car
EPA Passenger Volume (Cubic Ft)	88	90
Front Head Room (Inches)	39.3	38.4
Rear Head Room (Inches)	36.9	36.8
Front Leg Room (Inches)	42.5	42.4
Rear Leg Room (Inches)	33.2	34.8
Front Hip Room (Inches)	50.5	52.4
Rear Hip Room (Inches)	51.2	52.9
Front Shoulder Room (Inches)	52.8	53.4
Rear Shoulder Room (Inches)	52.2	52.8
Warranty:		
Basic Time (Months)	36	36
Basic Miles	36000	36000
Powertrain Time (Months)	60	36
Powertrain Miles	60000	36000
Rust Time (Months)	60	60
Rust Miles	UNLIMITED	100000

Glossary:

Not Applicable, NA = Feature does not apply to the vehicle

Not Available = Feature is not available as a manufacturer-installed item. It may be available as a dealer-installed item.

Not Listed, NL = Feature is not mentioned in manufacturer's literature (either promotional or internal literature supplied to AIC), but AIC has not ascertained that the vehicle manufacturer does not offer the feature. It may be available as an unadvertised manufacturer-installed item (either standard or optional) or as a dealer-installed item.

Selected Feature = This Feature was chosen by you during the Feature Configuration page or was added to the comparison vehicle by our pricing engine for valid comparison.

Included = While this option is not one of the features you chose, it has been added because it is included in a package that contains one of your selected features. In some cases, purchasing a package (instead of a stand-alone option) is the least expensive method to configure this vehicle

with all of the features that you selected. In other cases, purchasing a package may be required by the manufacturer because of other features you selected.

Optional = "The feature shown is available as an option on this vehicle, but is not included in the equipped price. Select "Configure" tab to add this feature to your configuration."

*DPI = Dealer Installed Option: The prices of Dealer Installed Options may vary from dealer to dealer and are affected by such factors as labor charges for installation and internal price markups. Dealer Installed Options are not included in the calculation of Total Equipped Price.

* 2000/2001 Manufacturer's Suggested Retail Price excludes taxes, license, title, optional or regionally required equipment, and destination charge. The destination charge may vary from state to state.

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Annex II

Conclusions of Cheju Seminar

1. The seminar had been organized by the Korean National Statistical Office (KNSO) and the International Monetary Fund (IMF). It took place at the Lotte Hotel, Jeju Island, Republic of Korea, 6-8 December 2000. It was attended by participants from 18 countries from around the world, as well as 7 international organizations. Eleven papers about national and international experiences on statistical quality assessment, management, and promotion were presented, and 10 discussants provided comments that opened the general discussions.
2. Participants took note of the existing wide variety of frameworks, approaches, objectives, techniques and instruments, having, however, the common objective to promote and monitor quality of statistics within national statistical organizations and at the international level.
3. Appreciation was expressed for the IMF's work on data quality, specifically the Data Quality Reference Site on the Internet and the comprehensive data quality assessment framework being developed. These were viewed as global initiatives to enlighten users on the quality of official statistics and to support countries in their efforts to improve the quality of their statistics. The IMF was encouraged to continue work on the generic and specific assessment frameworks, using the interactive, consultative processes it had applied so far. In particular, the IMF was encouraged to expand the number of specific frameworks, including through cooperation with other international organizations on datasets outside the IMF's core focus.
4. The effort of the United Nations Statistics Division (UNSD) to collect and disseminate examples of good practices relating to the Fundamental Principles of Official Statistics was welcomed. This effort had been recommended by a work session co-organized by the Singapore Department of Statistics, UNSD, and the IMF in January 1999. These examples, which are soon to be available on a Website, highlight factors that influence the overall environment in which statistical systems function and therefore directly or indirectly affect statistical quality.
5. As to country practices and experiences, various approaches to promoting and enhancing statistical quality were discussed. These include Total Quality Management (TQM), ISO 9000, and similar techniques, as well as methods for internal quality inspection (or self-assessment) and external assessments, including peer reviews (assessment of the quality of statistical systems, processes, and products by experts from other countries).
6. Some of these approaches focus on statistical processes, some on products, and some on the institutional setting; some encompass more than one of these perspectives. Some of these approaches focus on an individual data source (e.g., a survey), some on collective products derived from several data sources (e.g., national accounts). Some emphasize providing information to assist users in assessing data quality for their uses, while others emphasize information to feed back into the process. It was recognized that different quality indicators may have to be used according to the differing approaches and purposes.

7. Despite the differences among the approaches used, it was concluded that an overriding common characteristics of these approaches should be that they take the users' needs as their principal starting point.
8. Equally, it was concluded that, no matter whether methodologies were used that were readily available on the market or were self-developed systems, one of the key success factors for all quality initiatives was the commitment of the senior management of statistical offices (including statistical units in ministries, central banks, etc.). In pursuing quality and creating an environment in which quality was a core corporate issue, it was felt that the focus ought to be on initiatives for innovation and stimulating the exchange of expertise and experience, rather than on penalizing mistakes. In other words, management should aim to develop the learning organization and a culture of quality.
9. It was also concluded that the various approaches used all have their own advantages and disadvantages and that, further, these advantages and disadvantages would have differing weights according to differences in organizational structure (including the difference between centralized and decentralized statistical systems), management styles, main statistical sources (surveys or administrative registers), and levels of statistical development. Thus, the choice of an approach to the management of quality would need to reflect the differing national situations; in other words, no one size fits all.
10. Nevertheless, enough common ground was found to exist that it was clear that more work should be done at the international level in harmonizing terminology and operationalizing concepts regarding statistical quality. In addition, international organizations should continue to play a role in training activities aiming at improved statistical quality assessment and management, as well as in the development of statistical quality manuals that would systematically document experiences and approaches used at the national and international levels. Finally, it was concluded that the international discussion on statistical quality management ought to be continued. In this regard, the initiative taken by Statistics Sweden and Eurostat to co-host a seminar on the same topics, in May 2001, was welcomed, as were the session on Quality Programs in Statistics Agencies at the ISI meeting in August 2001 and the Statistics Canada symposium on Methodological Issues in Quality Management in late 2001.