

Final Report Project KIS

09

Ir Peter W.M. van Nederpelt EMEA

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Explanation of symbols

.	= data not available
*	= provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
–	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
blank	= not applicable
2007-2008	= 2007 to 2008 inclusive
2007/2008	= average of 2007 up to and including 2008
2007/'08	= crop year, financial year, school year etc. beginning in 2007 and ending in 2008
2005/'06–2007/'08	= crop year, financial year, etc. 2005/'06 to 2007/'08 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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Telephone .. +31 88 570 70 70
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Final Report Project KIS

Ir Peter W.M. van Nederpelt EMEA

Summary. This report describes the results of the project Quality of Statistics Relevant to Statistics Netherlands' Corporate Image (KIS) as reported to Eurostat. In the project KIS three tools are developed that can be used to manage the quality of statistical output: a checklist, a questionnaire quick scan and a questionnaire deep scan.

Furthermore the quality of the statistical output of the image-relevant statistics of Statistics Netherlands is measured: the availability of knowledge about a number of quality subjects and the frequency or problems with these subject. An implementation plan will be developed to put the results of the project into effect.

Keywords: Quality statistical output, image relevant statistics, checklist, quick scan, deep scan.

Version control

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Version	Date	Description of status	Author
1.0	27 January 2009	Approved by the Project Board KIS.	Peter van Nederpelt
1.1	5 February 2009	Annex 1 Checklist list published as a separate document. Annex 2 Results Quick Scan integrated in this Final Report. Annex 3 Results Deep Scan is confidential and therefore not published.	Peter van Nederpelt

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1.0	Eurostat, Project Board, Board of Directors
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1 Introduction

1.1 Goal of this document

The goal of this document is to report to Eurostat about the course and the results of the project Quality of Statistics Most Relevant to Statistics Netherlands' Corporate Image.

The name of the project is abbreviated to KIS according to the Dutch name of the project: **K**waliteit **I**magobepalende **S**tatistieken.

1.2 Goals of the project

The goals of the project KIS are:

1. To develop a framework for measuring and describing the quality of statistical output
2. To develop effective tools for measuring and describing the quality of statistical output
3. To make an inventory about the quality of statistical output for the image-relevant statistics (Quick Scan)
4. To formulate points of improvements for three image-relevant statistics (Deep Scan)

1.3 Agreement with Eurostat

On August 23, 2007 Eurostat and Statistics Netherlands signed an agreement. This agreement says that a Final Report will be produced (product B7). This Final Report must contain:

- An evaluation of the Method Report.
- The final version of the Method report.
- Experiences with 13 statistics that are reviewed by a Quick Scan.
- The results of an in depth-analysis of three image-relevant statistics as confidential annex.

In compliance with the agreement the next products are delivered:

- An evaluation of the Method report (Section 3 of the Final Report). During the project the name of the Method report has been changed to "Checklist", without changing its scope.
- The final version of the Method report (Checklist) in a separate report.
- Experiences with the statistics that are reviewed by the Quick Scan (Section 4 of the Final Report). The details of the results of the Quick Scans are published in a separate document (Annex 1).
- The results of three in depth-analysis (Section 5 of the Final Report). During the project the name of the in dept-analysis has been changed to "Deep Scan". The details of the Deep Scans are published in a separate, confidential document.

Apart from the assignment the next activities have been performed:

- The report Checklist discusses not only the quality dimension *accuracy* but all possible quality dimensions of statistical output. Nineteen dimensions are identified. The scope is therefore much broader than agreed.
- Not only accuracy is part of the scope of the Quick Scan but all nine quality dimensions that are distinguished by Eurostat. The scope is therefore much broader than agreed.

2 Evaluation of project management

The project KIS has been managed according to the principles of the project management method Prince2. This method is widely applied at Statistics Netherlands.

The project has been managed by a project board. Members of this project board were:

- The executive: Peter Struijs
- The suppliers of capacity: Barteld Braaksma, Ton van de Waal, Ruben Dood and Henk Goettsch.
- The senior users of the products of the project: all members mentioned above.

The project had one project manager who concentrated on planning and control: Dick Kroeze. He was assisted by Peter van Nederpelt, who had signed for the project. The latter was focused on the content of the project.

Other participants of the project were:

- Reinder Banning: assessment of the quality aspect coherence and comparability.
- Nino Platteel, Jeanne Roijen, Max Booleman, Barry Schouten and Piet Daas: reviewers of the Checklist.
- All respondents to the Quick Scans and Deep Scans.

To manage the project properly a project initiation document (PID, action plan) has been composed. This document has been approved by the project board of KIS. It was the guideline for monitoring the project.

The progression of the project has been reported by the project manager to the project board by High Light reports according to the Prince2 method.

We can conclude that the project has been managed in a professional way by following the rules of a project management method.

3 Evaluation of the Checklist

This section describes how the Checklist has been composed and what the relevance of this product is for Statistics Netherlands.

In the agreement with Eurostat this product had been called "Method Report" (B1, B3 and B5). During the project the name of this product has been changed into Checklist.

This name has been changed for two reasons:

- In accordance with the aim of the envisaged Method Report, the report contains a *checklist* of possible indicators to measure quality and possible measures to control quality.
- The report put nobody under an obligation. The name Checklist underlines this characteristic of the report.

The report contains not only a checklist of indicators and measures. It contains background information on each quality dimension of statistical output too. This leads to a selection of the most important indicators and measures.

The report Checklist has been published as a separate document (Annex 1 to the final report).

3.1 The realisation of the Checklist

Each section of the report Checklist discusses a quality dimension of statistical output.

It regards at least all quality dimensions that are mentioned in the Code of Practice.

1. Relevance
2. Accuracy
3. Comparability
4. Coherence
5. Timeliness
6. Punctuality
7. Accessibility
8. Clarity
9. Confidentiality

Furthermore attention is paid to the next dimensions:

10. Level of detail
11. Completeness
12. Numerical consistency
13. Plausibility
14. Disputability
15. Validity
16. Reliability
17. Controllability
18. Reproducibility
19. Availability

These last dimensions have been added to get a complete picture of the quality of statistical output. These dimensions can be found in internal documents of Statistics Netherlands and in external documents.

Each section has been structured in the same way. Each dimension has been described from different angles. These angles are:

1. Definition

2. Requirements
3. Effects of problems with the quality dimension (risks)
4. Importance of a quality dimension for the organisation and her environment (dependency)
5. Causes of problems (threats, vulnerabilities)
6. Indicators
7. Measures

These angles have been borrowed from the Object Oriented Quality Management Model (OQM-model). This model has been developed at Statistics Netherlands.

Part of the report has been devoted to the relationship (most of the time trade-offs) between the different quality dimensions. This part is put in annex 3 of the report Checklist.

In the annex to the report Checklist all indicators and measures are summarized in a checklist.

The name of the report Checklist reflects the main purpose of the report.

In the report Checklist two kinds of indicators and measures are distinguished and put in separate annexes. Indicators and measures can be applied 1) for the statistical program as a whole or 2) for individual statistics.

The indicators and measures are formulated in a question form. Indicators are in general formulated as an open question: *What is de value of indicator X*. In case of measures closed questions are asked: *Is measure Y taken?*

Before composing the report Checklist three assessments had been made about more complex quality dimensions:

- Accuracy
- Coherence
- Comparability

Separate reports about these subjects have been published in Dutch.

Several papers and reports have been used while composing the report. These documents are mentioned in the report Checklist as reference material. Important documents were in this respect the Code of Practice and the Handbook for Quality Reports. The latter report has been finalized in August 2008. There are some similarities between the Handbook for Quality Report of Eurostat and the report Checklist of CBS.

The quality of the report Checklist has been reviewed by a team consisting of two methodologists and three representatives of the statistical divisions of Statistics Netherlands. The review team formulated issues. These issues have been processed by the author of the Checklist. Issues who needed further explanation have been discussed in meetings of the review team. In total 140 issues have been processed in the Checklist.

3.2 The report Checklist

In this paragraph we evaluate the relevance of the report Checklist.

Among other things, the Checklist has been used in the process of designing two questionnaires in the project KIS:

- A questionnaire for the Quick Scan
- A questionnaire for the Deep Scan

During the project we came to the conclusion that the Checklist can be used for a number of other goals. These goals are:

1. Defining the quality of statistical output when (re)designing a statistical process.
2. Making agreements about the quality of statistical output (in service level agreements or covenants).
3. Designing and composing quality reports.
4. Managing quality of statistical output of existing statistical processes.
5. Composing and executing self assessments.
6. Composing a standard to be used in an audit of the quality of statistical output.
7. Eventually formulating a policy of minimum requirements for the statistics of Statistics Netherlands.

It is remarkable that the report can be used for as many as seven goals. We think that the reason for this is that in the report (fragmented) knowledge about quality of statistical output has been integrated. Furthermore the report contains no instructions or guidelines, i.e. no constraints as to how the report should be used.

The project board KIS has asked to the project team to compose an implementation plan for the Checklist. In this plan will be determined how these seven goals will be realised. This implementation plan will be presented to the Project Board and the Board of Directors.

The report Checklist has already in a very early stage in the project been used for composing a standard for auditing the quality of statistical output. Since then several audits have been performed while using this standard. The Board of Directors of Statistics Netherlands were pleasantly surprised about the results of the first audit that has been performed using this standard.

The indicators and measures in the checklist are based on the analysis of causes and effects of problems of each quality dimension. At each cause and effect of problems with a quality dimension one or more indicators and measures can be formulated. A cause effect analysis of problems with the quality of statistical output is hardly seen in literature.

The report is not only applicable to image-relevant statistics but to all statistics.

CBS is developing an organization wide quality framework (*CBS Kwaliteitsraamwerk*). The report Checklist can be mentioned in this framework as one of the (many) measures taken to control quality of statistical output.

3.3 The quality dimension Accuracy in the report Checklist

The cause and effect analysis of accuracy led us to a greater number of error types than usual. The reason for this is that error types like measurement errors, processing errors and model assumption errors have been decomposed. This decomposition has worked well in statistical audits as well in the Quick Scan and Deep Scan. It led us to a more precise analysis of possible quality problems.

In the report Checklist the traditional division in sampling and non-sampling errors has been abandoned as the main distinction. We distinguish errors made in three parts of the statistical process.

- Primary data collection
- Secondary data collection
- Processes after data collection

This way errors in registers get full attention.

At Statistical Netherlands the statistical processes have become more dependent of registers that are produced outside the statistical process in question. The accuracy of data has therefore become more dependent on errors these registers.

The meaning of the word register has been given a broad definition. Each dataset that is input for the statistical process and has not been produced by this process, is regarded as a register.

3.4 Evaluation of project goals

One of the goals of the project (# 1) was to develop a framework for measuring and describing the quality of statistics. The report Checklist is meant to be that framework. Question is whether we succeeded to achieve the defined goal of the project.

We may conclude that is report Checklist is not only a framework for *measuring and describing* the quality of statistics, but a framework for the quality of statistical output in general. The report describes the quality of statistical output from different angles in a rather exhaustive way.

The report Checklist cannot be characterized as a guideline or standard. It does not describe mandatory indicators or measures. The user of the report still has to make his or her own choices. However the report offers a fair basis to derive a guideline or standard if desired.

The report Checklist can be characterised as a framework of knowledge about quality of statistical output. Knowledge about quality of statistical output is integrated in one document.

We see at this moment no points of improvement of the report itself. A change management procedures will be applied to keep the document up to date. However, it is sensible to consider how we can use this report to improve the quality of statistical output more than we already have done in the project.

4 Evaluation of the Quick Scan

In this section the next items regarding the Quick Scan will be discussed:

1. The questionnaire of the Quick Scan
2. The realisation of the Quick Scan (process)
3. The results of the Quick Scan (content)
4. The Quick Scan as an instrument for future use
5. Evaluation of the Quick Scan by respondents
6. Evaluation of the project goals

CBS distinguishes 16 image-relevant statistics including 13 Eurostat statistics. The latter were meant to be reviewed by the project. In fact all 16 statistics has been brought within the scope of the project.

The final result is that the next statistics were reviewed:

1. Indices of business turnover and orders in hand
2. Business statistics
3. International Trade statistics
4. Government deficit and debt
5. Unemployment statistics
6. Employment statistics
7. Economic growth
8. Consumer price index
9. Producer price index
10. Population statistics
11. Labour force statistics
12. Income surveys

Apart from these statistics the following statistics that are image-relevant but are no Eurostat statistics are reviewed:

13. Income support and reintegration
14. Distribution of funds to municipalities and provinces
15. Security monitor

In stead of the planned 13 statistics 15 statistics has been reviewed. Not reviewed is:

16. Integration of minorities.

The outcome of Integration of Minorities is a publication and not a table. The Quick Scan could not be applied on this statistic.

4.1 The questionnaire of the Quick Scan

This paragraph evaluates the questionnaire of the Quick Scan.

First and foremost *all* quality dimensions of statistical output that are distinguished in the Code of Practice, are dealt with in the questionnaire. Therefore the scope of the questionnaire is broad.

At each quality dimension or statistical output one or more questions are formulated that originate from the checklist. The questions are general in nature.

Most questions start with "*What is known about*". Aim of the questionnaire is to get to know *what knowledge is available* about the quality of statistical output.

The questionnaire has 40 questions. All questions are clarified by an explanation.

In the explanation the quality dimension has been defined. The definitions originate from the report Checklist.

The questionnaire is provided with an instruction. This instruction says that questions also can be answered by "Unknown", "No information found" or "Not applicable" .

Furthermore the instructions ask to search for all document relevant to the quality of statistical output, number and list these documents and deliver all documents together with the questionnaire. The respondent is asked to refer at each answer to the document number.

The Quick Scan does not ask to evaluate the quality of statistical output. Also recommendations for improvement are not asked. At this point, among other things like the subjects, the Quick Scan is different form the Deep Scan.

4.2 The realisation of the Quick Scan

The suppliers of the project board searched for respondents within the statistical divisions who could fill in the questionnaire. Subject matter knowledge and availability were important in this respect.

The project manager sent the questionnaire to the respondents and asked them to fill in the questionnaire. The project team of the questionnaire was available for questions.

The respondents sent the completed questionnaires to the project team together with the set of documents the respondents had found.

The answers of the questionnaire have been classified in three categories: known, may be known, unknown or not applicable. For each question 100 points have been divided over these four categories.

If one question could be answered more than once these 100 points has been spread over all answers. So each question gets the same weight. Classification had been done by one person to promote consistency.

Next an average score has been calculated of all statistics that have responded. Each statistic got the same weight.

The process owners of the statistics experienced the Quick Scan as an administrative burden. It comes under the category of audits, quality reports and quality documents. The differences between these activities are hardly seen. It is therefore recommended that these activities are geared to each other. The feeling of redundancy should be avoided.

The Quick Scan was part of the annual plan of Statistics Netherlands, but was not part of the detailed planning of the process owners. This contributed to the fact that much effort was needed to get the necessary capacity available. It is therefore recommended to assure this capacity in time.

Moreover we overestimated the capacity needed to complete the questionnaire. Instead of the initial estimated 50 hours for some statistics 10 hours were sufficient.

4.3 The results of the Quick Scan

The results of the Quick Scans has been published as a separate document (Annex 2 to the Final Report).

The Quick Scan has not been pointed at individual statistics but at knowledge for the whole set of statistics that has been assessed and at shortcomings in this knowledge (blind spots).

Shortcomings in knowledge about quality of statistical output

The results show that there are great differences in availability of knowledge about certain quality dimensions and error types. The *availability of knowledge* is equal or less than 60 out of 100 points for the next subjects:

Accuracy

- Other errors like calculation and publication errors
- Linkage errors
- Model assumption errors
- Editing errors
- Transformation errors
- Register errors
- Outlier errors
- Classification errors
- Imputation errors

Relevance

- Agreements with customers

Clarity

- Clarity of metadata

In general, relatively much knowledge is available about errors made in the process of primary data collection. Less knowledge is available about errors in the process of secondary data collection and the process after data collection.

Problems with quality of statistical output

Most problems (4 statistics or more) are reported regarding:

- Register errors
- Sample errors
- Measurement errors
- Weighing errors
- Comparability in time within one time series
- Punctuality

It must be noted that problems with the quality of statistical output could be hidden if the knowledge score is low.

4.4 The Quick Scan for future use

In this paragraph we will discuss how the Quick Scan can be used in the future as an instrument to manage quality of statistical output.

Insight for top management

The Quick Scan has been proven to be an adequate instrument for management to get in a relative short time and relative little effort insight into *all* quality dimensions of statistical output.

- One understands in a nutshell what is known about the quality of a statistic. This is supported by documentation.
- It becomes clear on which areas there is a lack of knowledge (blind spots).

Overview for the process owner

One of the process owners perceived it as positive that the Quick Scan created an overview of all available documentation on quality of statistical output. He expressed this view during the evaluation of the Quick Scan (see chapter 4.5).

Auditing

The Quick Scan seems to be a good preparation to an audit. The process owner collects in a relative short time all documents that are important for assessing the quality of statistical output. Moreover the Quick Scan shows already the strong and weak points in the quality of statistical output. It becomes clear where knowledge about the quality of statistical output is lacking.

An auditor has to take more effort to get to this point than a process owner. The auditor can continue the assessment and make the assessment more profound. Furthermore the auditor can concentrate on the less clear or weak points.

The results of the Quick Scan will even in a short run be used as a starting point for an audit on Population statistics.

It should be mentioned that questions in a Quick Scan should be coherent with the standard used in the audit.

Implementation plan

In the implementation plan of the project KIS the future use of the Quick Scan will be discussed and presented to the project board and Board of Directors.

4.5 Evaluation of the Quick Scan by respondents

Shortly after realisation of the Quick Scan the respondents has been invited for a meeting to discuss the whole process with the project team. In these meetings the Quick Scans (and Deep Scans) are evaluated. In this evaluations a checklist is used.

The results of this evaluation can be summarized as follows:

- The goals of the project and the Quick Scan was clear.
- Not everybody was happy with the timing of the scan.
- Answering the questions costs substantially less time than was indicated by the project team.
- The questions were clearly formulated. No questions were missing.
- The results of the scans have added value for outsiders and for auditors. For insiders there is less added value; much is already known.
- Everybody is highly interested in the follow-up of the scans.

4.6 Evaluation of project goals

One of the project goals (# 2) was to develop effective tools for measuring and describing the quality of statistics.

The Quick Scan turned out to be a great tool for (self) assessing the quality of statistical output. *The subjects were well chosen as well as how the questions were asked.* Where knowledge is available it becomes clear what the weak and strong points of the quality of the statistical output are. The respondents evaluated the questions in he questionnaire as clear.

The user of the Quick Scan gets an overview of the quality of the statistical output. If the user wants to go deeply into the subject he can read the documentation added to the Quick Scan. It is a good starting point for an audit.

The Quick Scan makes also visible what the shortcoming in the knowledge about the quality of the statistical output are (blind spots). It shows where not sufficient knowledge is available.

The effort to perform a Quick Scan is relative small.

Point of improvement of the Quick Scan as a tool are:

- Plan a Quick Scan well in advance so that respondents are available in time.
- Don't overestimate the time needed to fill in the questionnaire.
- Ask one question at the time en add more explanation where needed.
- Formulate questions more specific: What is known about problems with X? What is known about measures taken? What is known about the effect is on the accuracy of the statistical output in case of errors?
- Ask for comment on each question in the questionnaire.

Another project goal (# 3) was to make an inventory about the quality of statistical output for the image-relevant statistics (Quick Scan).

The result of the Quick Scan shows which and how many statistics has problems with specific subjects. It also shows where there are shortcomings in knowledge about quality of statistical output.

In general relative much knowledge is available about errors made in the process of primary data collection. Less knowledge is available about errors in the process of secondary data collection and the process after data collection.

Most problems (4 statistics or more) are reported regarding:

- Register errors
- Sample errors
- Measurement errors
- Weighing errors
- Comparability in time within one time series
- Punctuality

It must be noted that problems could be hidden if the knowledge score is low.

5 Evaluation of the Deep Scan

In this section the next items regarding the Deep Scan will be discussed:

1. The questionnaire of the Deep Scan
2. The realisation of the Deep Scan (process)
3. The results of the Deep Scan (content)
4. The Deep Scan as an instrument for future use
5. Evaluation of the project goals

The following three statistics have been reviewed:

1. Labour force statistics
2. International trade statistics
3. Economic growth quarterly

5.1 The questionnaire of the Deep Scan

All questions in the questionnaire of the Deep Scan originate from (an earlier version of) the report Checklist. These questions are put in the questionnaire unchanged.

The questionnaire of the Deep Scan contains only questions about the quality dimension accuracy. This restriction has been made to reduce the administrative burden of the respondent.

In the Deep Scan each time the same types of question are asked:

- What is the value of indicator X?
- Or: Is measure Y taken?
- What is the risk for the organisation?
- What are recommendations for improvement?

Therefore in the questionnaire of the Deep Scan the respondent is asked to assess the quality of the statistical output and to formulate recommendations for improvement.

The number of questions is 45.

Next to the questions the respondent is asked to give comment on the quality of the questions. This opportunity has been created for each individual question.

We learned from the comment that the questionnaire could be improved.

Recommendations for improvement are:

- Explain words like methodology series, CBS Quality System, conceptual metadata and transformation errors.
- Ask in all cases one question at the time.
- Be as specific as possible.

5.2 The realisation of the Deep Scan

The Deep Scan has been applied on three out of 16 image relevant statistics.

To find the capacity for realisation of the Deep Scan was not that easy. Different reasons could be appointed:

- Originally it was planned to integrate the Quick Scan into the Deep Scan. It would be sufficient then to fill in one questionnaire. On second thoughts it seemed not a good idea to integrate both scans because of the different characteristics of the two scans. Consequence was that the process owner had to fill in two questionnaires.

- The capacity needed to fill in the Deep Scan was estimated at 50 hours. This was perceived as substantial by the process owners. This held them back from allocating capacity for this activity. However it turned out that no more than 8 hours were needed.

Despite the restraints three process owners have agreed to fill in the questionnaire of the Deep Scan.

5.3 The result of the Deep Scans

The results of the Deep Scan are reported in a separate, confidential document (Annex 3 to the Final Report). In the report at hand we will not pay further attention to the *results* of the Deep Scans.

5.4 The Deep Scan as instrument for future use

In this paragraph the Deep Scan as instrument for future use is discussed.

Image-relevant statistics

It was already planned to assess all 16 image-relevant statistics by a Deep Scan in the period 2008 until 2011.

To assure the necessary capacity in the annual plan 2009 is stated that division Methodology and Quality needs capacity from the statistical divisions.

Combination with the Quick Scan

It is possible to combine the Quick Scan and the Deep Scan. The Quick Scan creates an overview on all quality dimension of statistical output. Based on the results on the Quick Scan a Deep Scan can be designed and performed. One can focus the Deep Scan on the points that need more attention: lack of knowledge about or shortcomings in quality.

Implementation plan

In the implementation plan of the project KIS the future use of the Deep Scan will be discussed and presented to the Project Board and Board of Directors.

5.5 Evaluation of project goals

One of the project goals (# 2) was to develop effective tools for measuring and describing the quality of statistics. Another project goal (#4) was to formulate points of improvements for three image-relevant statistics (Deep Scan).

We were not very much impressed by the results of the Deep Scan. Not much information is given in the Deep Scans. Several questions are answered with *not applicable* but are all these answers right? The number of proposed recommendations is limited. An average audit produces a greater number recommendations for improvement.

We have the next explanations for these weak results:

- We asked 'closed' questions. Is measure Y taken? The answer is then Yes or No. This is not very informative for the reader.
- We asked for values of indicators. If this indicator is not used this question can not be answered.
- We asked to formulate what risk is involved (if measures are not taken or indicator values are too low). Respondents will tend to give political correct answers or report no risk to avoid further questions.
- We asked to formulate recommendations for improvement. Respondents will tend to give political correct answers: actions for improvement that are already planned.

- No documentation is asked like in the Quick Scan. Of course therefore no documentation is added by the respondent.
- We asked for three statistics to fill in two questionnaires: a Quick Scan *and* a Deep Scan.

In general the quality of the questions in the questionnaire could be better.

The subjects chosen in the Deep Scan were right.

Furthermore was a positive point that we asked for comment on each question in the Deep Scan. The comment we got was fruitful.

We can conclude that the quality of the tool Deep Scan was weak. The results of the Deep Scan were correspondingly. However it was fruitful to ask for comment on the questions to the respondent in the questionnaire.

Points of improvement are:

- Add the items from the Deep Scan to the Quick Scan. Use the rules that are applied in the Quick Scan.
 1. Ask open questions. What is known about
 2. Ask harmless questions. Ask especially for facts and less for judgements and/or proposals/ideas/recommendations.
 3. Ask for documentation
- Send one questionnaire instead of two. It is better to make two versions (a short one and a long one) if necessary.

6 Evaluation of scans in general

In this section we will summarize the learning points for future scans about the quality of statistical output.

The questionnaire

1. Don't hesitate to change the subjects in the Quick Scan and Deep Scan we used in KIS. Determine the subject for the questionnaire dependent on what you want to know. See the current scans only as an example.
2. Derive the subjects of the questionnaire from the report Checklist. Be coherent with the Checklist.
3. Ask open questions. Otherwise you get only Yes or No answers.
4. Ask preferably about facts in stead of judgements or recommendations.
5. Start each question with: *What do you know about* or *What is known about...*
6. Be specific about you want to know: quality problems, measures taken, status of these measures, indicators used, quality reports, effect of problems on the final product.
7. Ask one question at the time. Do not combine questions.
8. Explain each question. Don't formulate a second question to explain the first question. Define uncommon terms.
9. Ask for comment on each question.
10. Limit the number of questions to 40.

The process

11. Plan scans well in advance so management has enough time to make capacity available.
12. Do not overestimate to management the capacity needed to fill in the questionnaire.
13. Send only one questionnaire at a time.
14. Give feedback to the respondent and ask the respondent to adapt the answers eventually in order to improve the quality of the answers.
15. Ask for approval of the responsible management to the answers given.

7 Conclusion

The evaluation of the Checklist, the Quick Scan and the Deep Scan can be summarized as follows:

Checklist

The strength of the report Checklist is that fragmented knowledge about the quality of statistical output has been integrated in a (standard) framework. The report contains moreover an overview of possible indicators and measures. However it contains no instructions or guidelines. Therefore this report can serve several goals. Seven goals are identified.

Project goal #1 to compose a framework for measuring and describing the quality of statistical output is largely met.

Quick Scan: questionnaire and results

The Quick Scans turned out to be a great tool to make an inventory of information about quality of statistical output. Project goal #2 to develop an effective tools is largely met by the Quick Scan. If documentation about a statistical process is up to date the questionnaire is certainly not very time consuming.

The results of the Quick Scan are valuable. Problems are identified about knowledge about the quality of statistical output *and* the quality of the statistical output itself. Therefore project goal #3 to make an inventory about the quality of statistical output for the image-relevant statistics is largely met.

Deep Scan: questionnaire and results

The quality of the tool Deep Scan is weak and the results are correspondingly. It is fruitful to ask comment on the question in the questionnaire to the respondent. Points of improvement are to compose the questionnaire the same way as was done with the Quick Scan and send only one questionnaire to respondents in stead of two. Use the items of the Deep Scan to expand the Quick Scan.

Project goal #2 to develop an effective tool and project goal #4 to formulate points of improvement are partly met.

Scans in general

Several learning points are formulated for future scans about quality of statistical output.

1 Annex 1: Results of the Quick Scan

1.1 Introduction

Goal of the annex

The goal of this annex is to report to Eurostat about the results of the Quick Scans.

Scope of the document

The Quick Scan has been applied tot 15 image-relevant statistics:

1. Indices of business turnover and orders in hand
2. Business statistics
3. International Trade statistics
4. Government deficit and debt
5. Unemployment statistics
6. Income statistics
7. Employment statistics
8. Economic growth
9. Consumer price index
10. Producer price index
11. Population statistics
12. Labour force statistics
13. Income support and reintegration
14. Distribution of funds to municipalities and provinces
15. Security monitor

We report in this document two items:

- The availability of knowledge about quality of statistical output. This availability is expressed in a score from 0 to 100.
- How many statistics report quality problems (in case knowledge about quality is available).

If the knowledge score is 0 there is a knowledge problem and not necessarily a quality problems. It is also possible that problems are still hidden.

The scope of this document limited by de number questions asked in the Quick Scan. These questions regard the next subjects:

Accuracy

1. Register errors
2. Sample errors
3. Measurement errors
4. Classification errors
5. Data entry errors
6. Editing errors
7. Imputation errors
8. Outlier errors
9. Linking errors
10. Weighing errors
11. Unit non response
12. Item non response
13. Model assumption errors
14. Transformation errors
15. Other errors

Coherence and comparability

16. Coherence to statistics outside CBS
17. Coherence to statistics within CBS with similar variables
18. Coherence to statistics within CBS with the same population
19. Numerical consistency between provisional and final results
20. Numerical consistency between short term and long term statistics
21. Numerical consistency with National Accounts
22. Comparability in time: length time series
23. Comparability in time within one time series
24. Comparability between domains international
25. Comparability between domains in the Netherlands

Other quality dimension

26. Agreements with customers
27. Information on customer needs
28. Customer satisfaction timeliness
29. Punctuality
30. Availability of conceptual metadata for customers
31. Availability of process metadata for customers
32. Availability of quality metadata for customers
33. Clarity of metadata
34. Completeness of variables
35. Completeness of classifications
36. Completeness of level of detail
37. Confidentiality of statistical output

Chapter 1.2 shows the scores of the availability of knowledge about quality. Chapter 1.3, 1.4 and 1.5 describes shortly the results of the Quick Scan for each question that has been asked. Chapter 1.6 summarizes the results of the Quick Scan.

Classification of availability of knowledge

The next classification is used in the Quick Scan. This classification is used to measure the availability of knowledge about quality.

Level A	Level B	Definition
Knowledge available	Known error	The presence or absence of quality problems is mentioned. One more errors are quantified. One or more causes of problems are described. One or more measures to reduce the problem are described.
	Error may be known	Link to a document.
	Error not applicable	
Knowledge unavailable	Unknown error	No answer (blank) Question mark Answer to another question (wrong answer)

Level A is used in the graphs in this document. Level B is used in the classification process by the project team.

Unavailability of knowledge means there are *blind spots* or *shortcomings* in the knowledge about quality.

Quality problems

We report a quality problem at a statistic if in the text of the answer of a question of the Quick Scan a problem is mentioned. These problems may be small or large, resolved or unresolved, have large or small impact. The magnitude and effect of the problem is not measured in the Quick Scan.

If problems are reported we only can conclude that follow-up or further attention is needed.

The description of the problems can be found in the answers at the questions of the Quick Scan. All answers of the respondents are put in one document (in Dutch) called "Overview Quick Scan".

1.2 Availability of knowledge about quality of statistical output

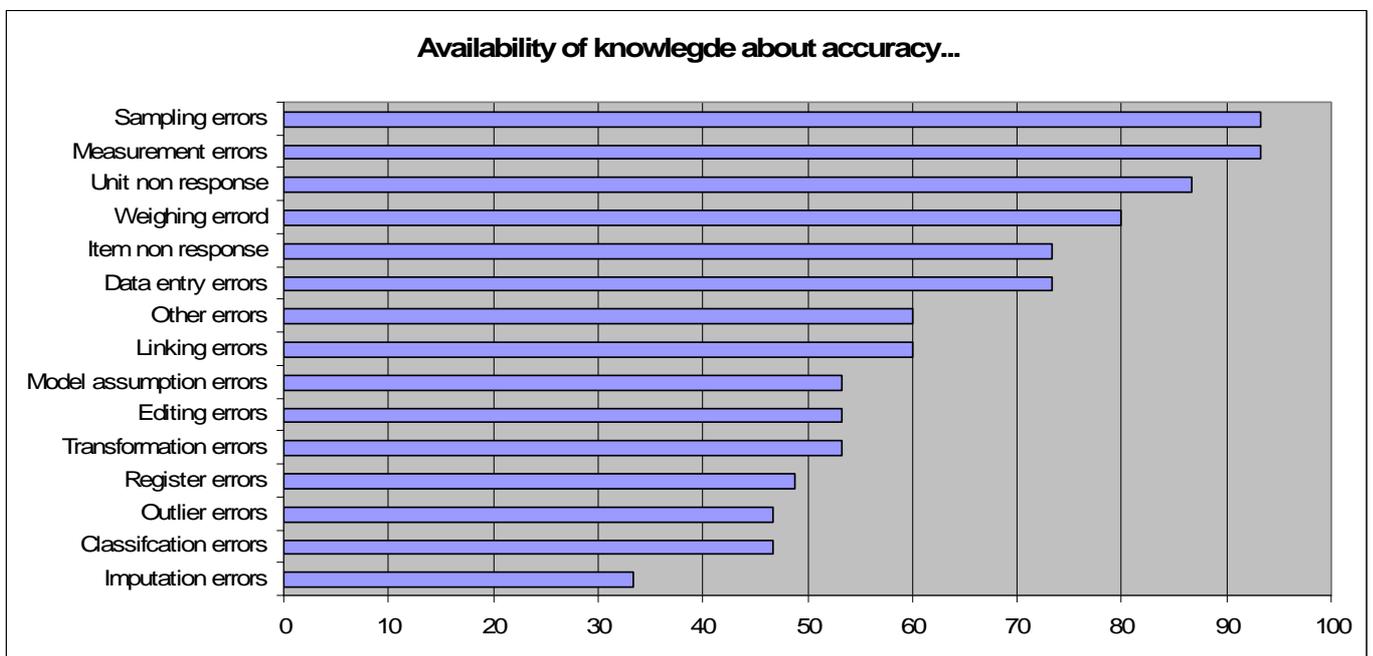
In this section we summarize the availability of knowledge about the quality of statistical output.

The results of the Quick Scan are divided in three groups of dimensions:

- accuracy,
- coherence and
- other dimensions.

1.2.1 Accuracy

This chapter shows in a graph the degree to which knowledge is available about the error types regarding accuracy.



Conclusion

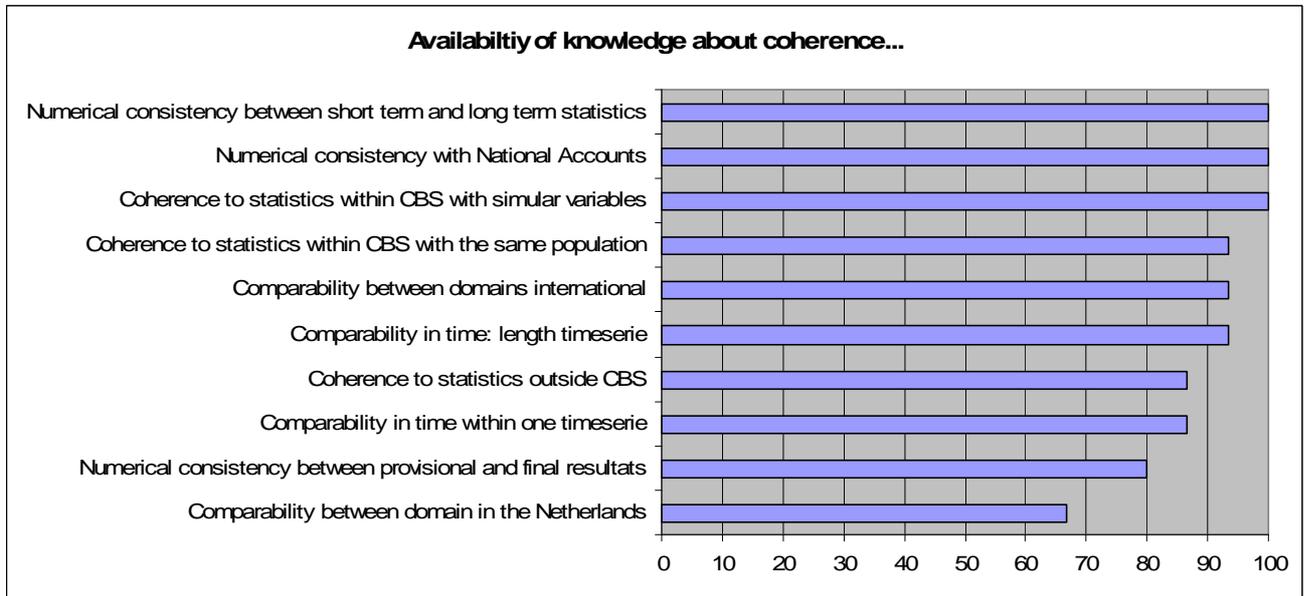
Most knowledge is available about sampling errors and measurement errors. The availability of knowledge is equal or less than 60 out of 100 points for:

- Other errors: calculation and publication errors
- Linkage errors
- Model assumption errors
- Editing errors
- Transformation errors
- Register errors
- Outlier errors
- Classification errors
- Imputation errors

In general there is relatively much knowledge available about errors made in the process of primary data collection. Less knowledge is available about errors in the process of secondary data collection and the process after data collection.

1.2.2 Coherence

This chapter shows in a graph the degree to which knowledge is (un)available about coherence.

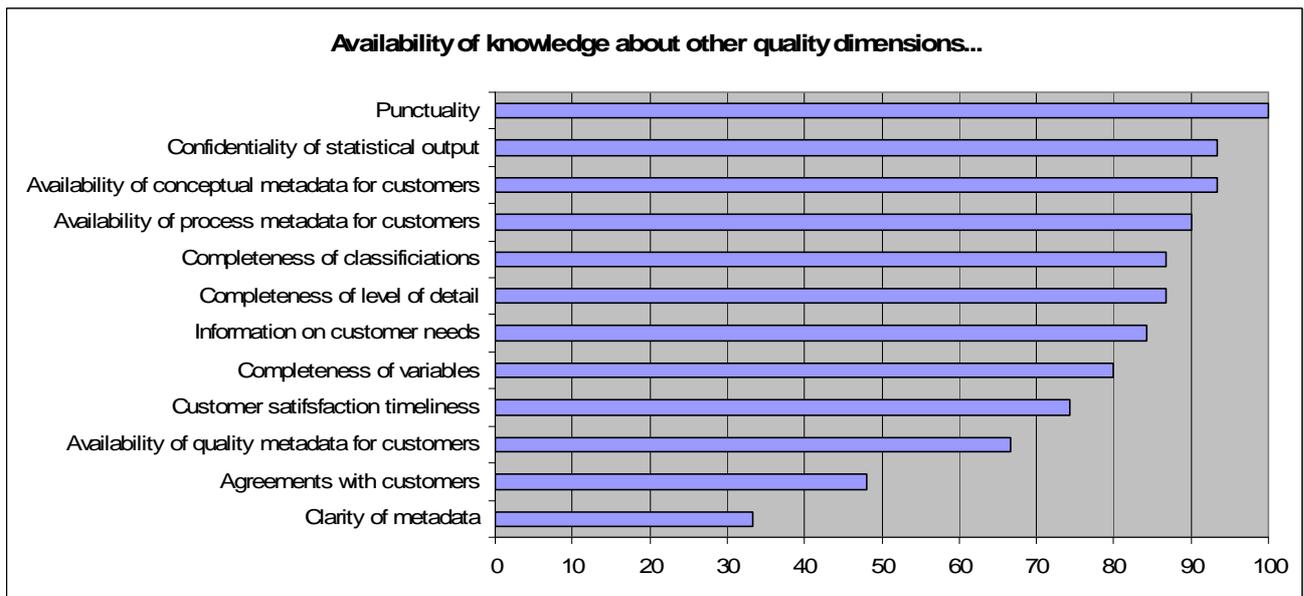


Conclusion

The availability of knowledge is for *no* type of coherence equal or less than 60 out of 100 points. This means that knowledge about coherence is rather good.

1.2.3 Other quality dimensions

This chapter shows in a graph the degree to which knowledge is (un)available about other quality dimensions.



1.2.4 Conclusion

Most knowledge is available about punctuality, confidentiality and availability of conceptual metadata for customers.

The availability of knowledge is equal or less than 60 out of 100 points for:

- Agreements with customers (relevance)
- Clarity of metadata (clarity)

This means that there is room for improvement for knowledge about these two subjects.

1.3 Accuracy

In this chapter we describe the results of the Quick Scan regarding errors that can effect the accuracy of the figures.

1.3.1 Results for each item

Register errors

Knowledge score: 49

Quality: 6 statistics reported problems.

Sample errors

Knowledge score: 93

Quality: 4 statistics reported quality problems.

Measurement errors

Knowledge score: 93

Quality: 4 statistics reported quality problems.

Classification errors

Knowledge score: 47

Quality: 1 statistic reported quality problems.

Data entry errors

Knowledge score: 73

Quality: No problems are reported.

Editing errors

Knowledge score: 53

Quality: 1 statistic reported problems.

Imputation errors

Knowledge score: 33

Quality: No problems are reported.

Outlier errors

Knowledge score: 47

Quality: 3 statistics reported problems with outliers.

Linking errors

Knowledge score: 57

Quality: 1 statistic reported (small) problems.

Weighing errors

Knowledge score: 80

Quality: 4 statistics reported problems.

Unit non response

Knowledge score: 87

Quality: 3 statistics reported problems.

Item non response

Knowledge score: 73

Quality: No problems are reported.

Model assumption errors

Knowledge score: 53

Quality: 2 statistics reported problems.

Transformation errors

Knowledge score: 53

Quality: No problems are reported.

Other errors: calculation and publication errors

Knowledge score: 60

Quality: 2 statistics reported problems.

1.3.2 Summary

Most problems are reported regarding:

- Register errors
- Sample errors
- Measurement errors
- Weighing errors

Knowledge problems are already concluded in chapter 1.2.

1.4 Coherence and comparability

In this chapter we describe the results of the Quick Scan regarding problems with coherence and comparability.

1.4.1 Results for each item

Coherence to statistics outside CBS

Knowledge score: 87

Quality: 3 statistics reported problems.

Coherence to statistics within CBS with similar variables

Knowledge score: 93

Quality: 3 statistics reported problems.

Coherence to statistics within CBS with the same population

Knowledge score: 93

Quality: 0 statistics reported problems.

Numerical consistency between provisional and final results

Knowledge score: 80

Quality: 0 statistics reported problems

Numerical consistency between short term and long term statistics

Knowledge score: 100

Quality: 1 statistic reported problems.

Numerical consistency with National Accounts

Knowledge score: 100

Quality: 3 statistics reported problems.

Comparability in time: length time series

Knowledge score: 93

Quality: No problems are reported.

Comparability in time within one time series

Knowledge score: 87

Quality: 4 statistics reported problems.

Comparability between domains international

Knowledge score: 93

Quality: 1 statistic reported problems.

Comparability between domains in the Netherlands

Knowledge score: 67

Quality: 1 statistic reported problems.

1.4.2 Conclusion

Most problems are reported about *comparability in time within one time series*. Knowledge problems are already concluded in section 2.

1.5 Other quality dimension

In this chapter we describe the results of the Quick Scan regarding problems with 'other' quality dimension.

1.5.1 Results for each item

Agreements with customers

Knowledge score: 48

Quality: 2 statistics reported problems of missing agreements.

Information on customer needs

Knowledge score: 84

Quality: No problems are reported.

Customer satisfaction timeliness

Knowledge score: 74

Quality: 1 statistic reported problems.

Punctuality

Knowledge score: 100

Quality: 4 statistics reported problems.

Availability of conceptual metadata for customers

Knowledge score: 93

Quality: No problems are reported.

Availability of process metadata for customers

Knowledge score: 90

Quality: 2 statistics reported problems.

Availability of quality metadata for customers

Knowledge score: 67

Quality: 1 statistic reported problems.

Clarity of metadata

Knowledge score: 33

Quality: 3 statistics reported problems.

Completeness of variables

Knowledge score: 80

Quality: 1 statistic reported problems.

Completeness of classifications

Knowledge score: 87

Quality: No problems are reported.

Completeness of level of detail

Knowledge score: 87

Quality: No problems are reported.

Confidentiality of statistical output

Knowledge score: 93

Quality: 1 statistic reported problems.

1.5.2 Conclusion

Most problems are reported about *punctuality*. Knowledge problems are already concluded in section 2.

1.6 Summary

In this section we summarize the conclusions already mentioned in the sections before. Only subjects that need attention are mentioned here.

1.6.1 Availability of knowledge about quality

The knowledge score is equal or less than 60 for:

Accuracy

- Other errors: calculation and publication errors
- Linkage errors
- Model assumption errors
- Editing errors
- Transformation errors
- Register errors
- Outlier errors
- Classification errors
- Imputation errors

Relevance

- Agreements with customers

Clarity

- Clarity of metadata

In general relative much knowledge is available about errors made in the process of primary data collection. Less knowledge is available about errors in the process of secondary data collection and the process after data collection.

1.6.2 Quality problems

Most problems (4 statistics or more) are reported regard:

- Register errors
- Sample errors
- Measurement errors
- Weighing errors
- Comparability in time within one time series
- Punctuality

It must be noted that problems could be hidden if the knowledge score is low.