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**QUALITY MANAGEMENT AND AUDITING OF CONSUMER PRICE INDICES**

Invited paper submitted by Office for National Statistics, United Kingdom\*

Summary

The Consumer Prices and General Inflation Division (CPGID) of the UK Office for National Statistics (ONS) is responsible for producing a wide range of inflation measures. The measure with the highest profile is the monthly Retail Prices Index (RPI). The latter is the main domestic measure of consumer inflation and CPGID is committed to the production of a high quality RPI where quality is defined as "a process of continuous improvement, systematically evaluated against customer requirements". Achievement of this goal is assessed through an evaluation of accuracy, timeliness, efficiency and relevance against pre-set targets.

In this context ISO 9000 has become an integral part of an ongoing programme designed to improve the quality of the United Kingdom's Retail Prices Index. It is a key element underlying a formal quality management system for the monthly production process, which also includes the use of the EFQM Excellence Model, and benchmarking against other National Statistical Institutes.

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This paper covers a general review of the meaning of quality, the different approaches available to quality management, the potential these have to impact on business performance and how the latter can be measured.

The paper describes different aspects of a Quality Management System and how they are addressed by the UK Office for National Statistics. The paper also describes some of the benefits that have accrued from using a formal Quality Management System and conversely addresses some of the disadvantages that can be associated with formal quality management systems. Also described is how a quality management framework can be used as a vehicle for process re-engineering. Business performance is considered in the context of the ultimate quality of the consumer price index. Within this framework the paper reviews the role of benchmarking a CPI against CPIs produced by other National Statistical Institutes.

A number of case studies are provided to give extra practical insight.

## I. Introduction

1. Consumer price indices are one of the most important and widely used of macroeconomic indicators. As well as informing economic policy they are used for indexation of welfare benefits and securities and also for escalation clauses in private contracts. Accuracy and reliability is of paramount importance. An overstatement or understatement of inflation can directly affect Government expenditure and receipts as well as have long-term consequences on the well being of a citizen through the impact of poor data on the success of economic decision making and ultimately the performance of an economy. Associated problems relating to escalation clauses in private contracts can impact on the financial viability of individual companies and their ability to provide employment to individuals.

### Definition of quality

2. A literature search highlights varying perceptions about the meaning of quality but an important common thread is the requirement to react to and serve user needs. Thus the implementation of an effective quality management system requires a high level understanding of what **customers need** and the translation of this into a coherent statistical and quality framework. Such a framework is also necessary for putting together **criteria for judging success**. User needs can be canvassed either formally through negotiation of contractual obligations which may or may not be legally binding or less formally through talking to customers on a one-to-one basis or through customer surveys.

3. One possible **definition of quality**, as used for the purposes of the UK RPI, is " **a process of continuous improvement, systematically evaluated against customer requirements**". Performance can be measured against a combination of five factors: accuracy; timeliness; efficiency; relevance; coherence.

A strategic framework for a quality organisation

4. Organisations that are associated with quality outputs have a number of characteristics in common:

- they have a coherent business strategy and vision which is shared by the whole organisation;
- this includes a commitment to quality and continuous improvement and a recognition of the benefits that this can bring;
- they are open to external influences and are willing to learn from others;
- they are customer orientated;
- they have organisational structures that encourage evaluation and self criticism;
- there are procedures in place to encourage innovation;
- employees are fully involved in quality issues and innovation;
- there is a clear link between corporate business objectives and personal work objectives;
- this is supported by action plans with specific targets;
- there are training plans for employees so that the required skills are available and can be mobilised.

5. To put this into effect there should be a recognition in high level documentation that "quality" is important; it is not static but is a continuous process; and that it encompasses a number of issues including meeting customer needs, producing a product or service to rigorous specifications; and avoiding errors.

6. In a public sector organisation contractual relationships can be taken forward with main government customers through the negotiation of relevant **Service Level Agreements (SLAs)**. These provide a working level document within a broader umbrella agreement or **Concordat**. The latter defines respective roles and responsibilities and mechanisms for the management of working relationships. Service Level Agreements (SLAs) underpin concordats by giving a more detailed description of particular services provided by the national statistical institute, performance standards and steering and management arrangements. They can be reviewed annually as part of the annual business planning round and help to inform **Business Plans** and more frequently when dictated by operational requirements. SLAs should not necessarily be seen as legally binding but should be designed to provide a mutual understanding of the services government departments can expect from the national statistical institute. There are strong arguments in terms of

transparency of government for both concordats and service level agreements to be published. They can also provide the basis each year for formal feedback from customers on performance with the opportunity for publication of the latter in summary form in an Annual Report which may form part of a formal arrangement of performance reporting to Parliament.

7. In many countries issues relating to the Governance of the national statistical institute are set down in a **Framework Document** or similar document. This is a much higher level document than either the SLA or Concordat. It defines the functions and responsibilities of the national statistical institute and generally guides and directs the work of the office. It is of strategic importance and can strongly influence the direction of the office. For instance, one of the objectives of ONS as stated in its Framework Document is to "improve the **quality** and relevance of its service to customers- both in government and the wider user community". The Framework Document thus recognises directly that quality management is a continuous process.

8. This recognition of the importance of quality can be further endorsed by a published vision of the national statistical institute as a key supplier of authoritative, timely and high **quality** information. In ONS this is encapsulated in the ONS objectives published in its annual business plan. These include improving **quality** and relevance thereby increasing public confidence in the integrity and validity of ONS outputs. The objectives are further re-enforced by a **Charter Statement for Customers and Suppliers** which gives a public commitment on standards of service to customers in general and by a published **Vision** of ONS as a provider of authoritative, timely and high **quality** statistics.

#### Performance Management

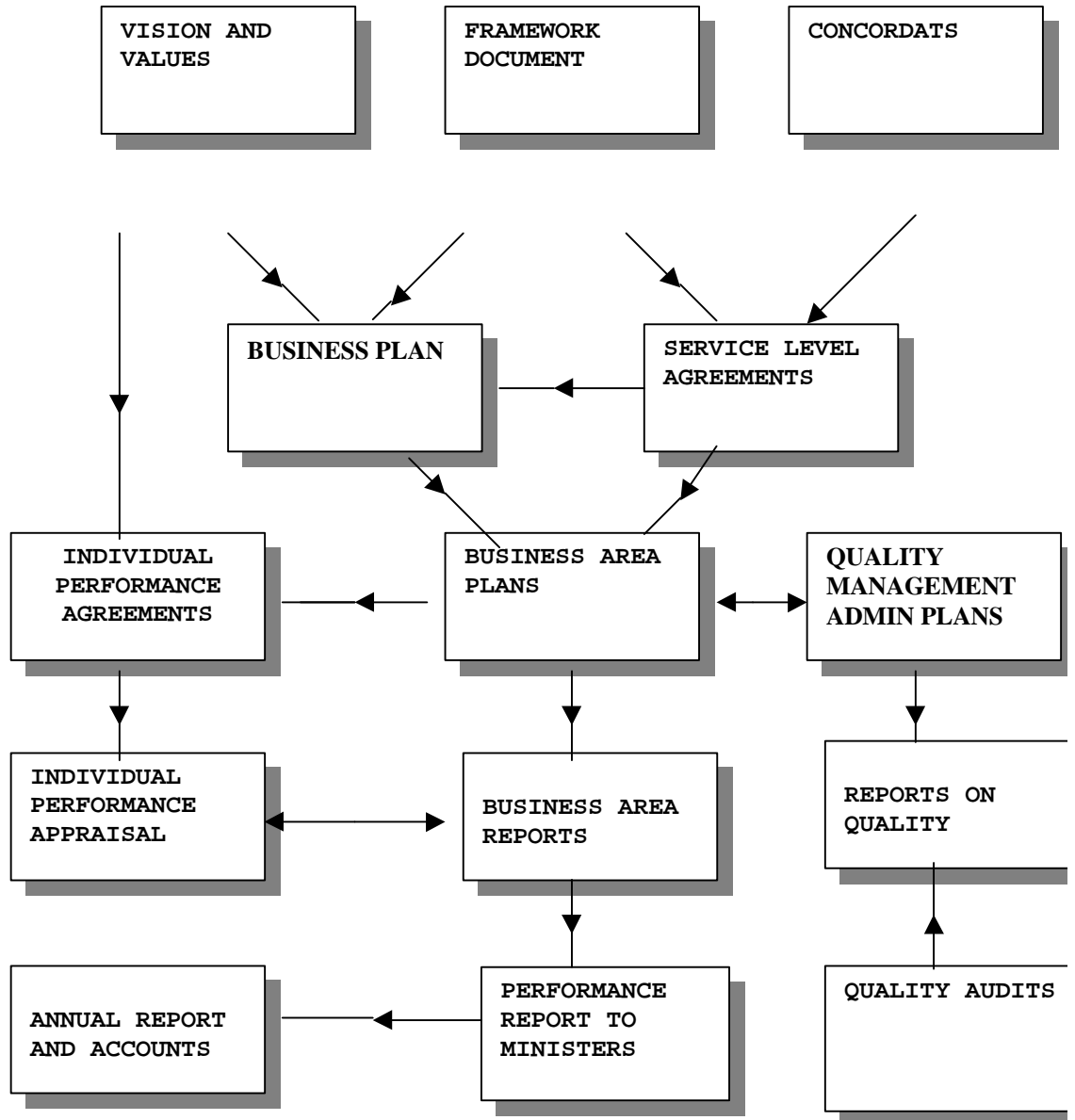
9. Equally important is the transfer across to an effective performance management system for individuals. Performance management can be seen as a continuous process designed to **improve** work outputs by focussing on what people actually **achieve** rather than the amount of effort put into the work. It should provide the link between the objectives of the individual and those of their team and the wider organisation so that work plans are coherent across the organisation and everybody knows what they are doing and why they are doing it. The performance management system should provide clear objectives for monitoring and evaluation to enable feedback on performance and also to assist with the identification of the development needs of individuals.

10. Performance management should be continuous.

11. All the above are found in the UK model. This can be generalised as follows:

Structural model for Quality Organisation

What guides an  
Organisation?



**II. Quality management systems**

12. There are a number of best-practice standards that can be exploited to help organisations to improve quality management, some of which have the added advantage of being internationally recognised.

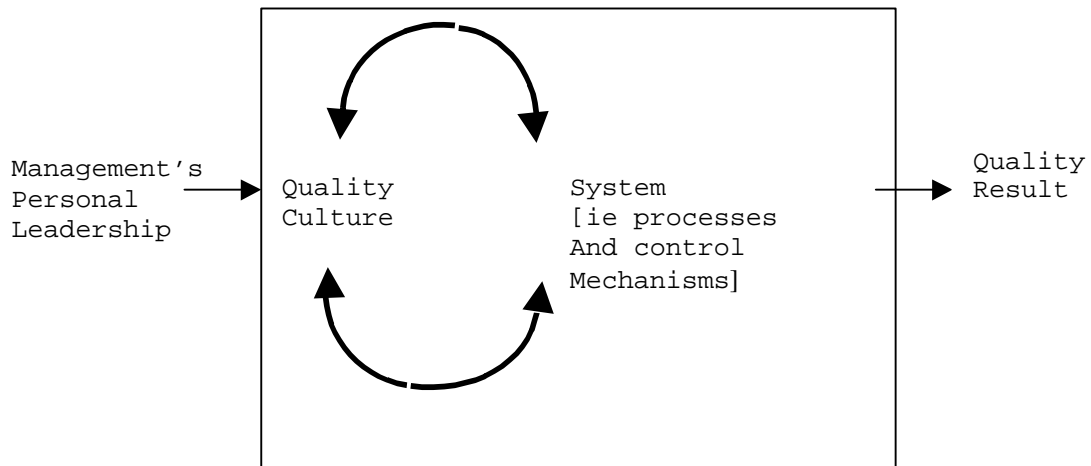
Total Quality Management (TQM)

13. Total Quality Management or TQM is most closely identified with a management philosophy rather than a highly specified and structured system. The characteristics associated with TQM and an effective quality culture in an organisation include:

- clearly defined organisational goals;
- strong customer focus;
- strategic quality planning;
- process orientation;
- employee empowerment;
- information sharing;
- continuous quality improvement.

14. Successful implementation relies on the ability of an organisation to integrate these characteristics into a common organisational structure. In its most simplistic form TQM can be represented diagrammatically as follows (see next page for more detailed implementation model):

Total Quality Management



### Benchmarking

15. Benchmarking is a process of comparing with, and learning from, others about what you do and how well you do it, with the aim of creating improvements.

16. Whilst the performance of one organisation may be improving all the time, it may still lag behind others and, more importantly, behind the ever-rising expectations of customers. World Class Organisations do not satisfy themselves that their performance is better than it was - the emphasis is on bettering performance against other comparable organisations.

17. Amongst the reasons why benchmarking is both desirable and necessary, perhaps the major driver is the ever-increasing pace of change, which demands both incremental improvements to stay in the game and breakthrough improvement to get in front. This pressure applies equally to the public as the private sector, as customer expectations are ever increasing with higher levels of service demanded at a lower cost in terms of price or resources.

18. Using benchmarking can help an organisation to:

- Establish a baseline of its own performance
- Compare its performance and practice with others
- Capture new ideas from tested and proven practices
- Identify methods of achieving superior performance
- Identify clear goals.

### European Guide to Industrial Innovation

19. A further development, which takes benchmarking in a particular direction, is the European Commission's "European Guide to Industrial Innovation". This guide is designed to help organisations improve quality through innovation and supports organisations that are interested in exploiting the benefits of TQM. Despite its title the guide is of relevance to all organisations.

20. The guide consists of three parts:

- **Part 1-** a summary of the benefits of innovation illustrated by examples of best practice. This part also includes a generic **best practice framework** (see below);

- **Part 2-** a computer-based self-assessment package to help organisations identify their main strengths and weaknesses and to develop an action plan to become a more innovative organisation;
- **Part 3-** an index of appropriate management tools.

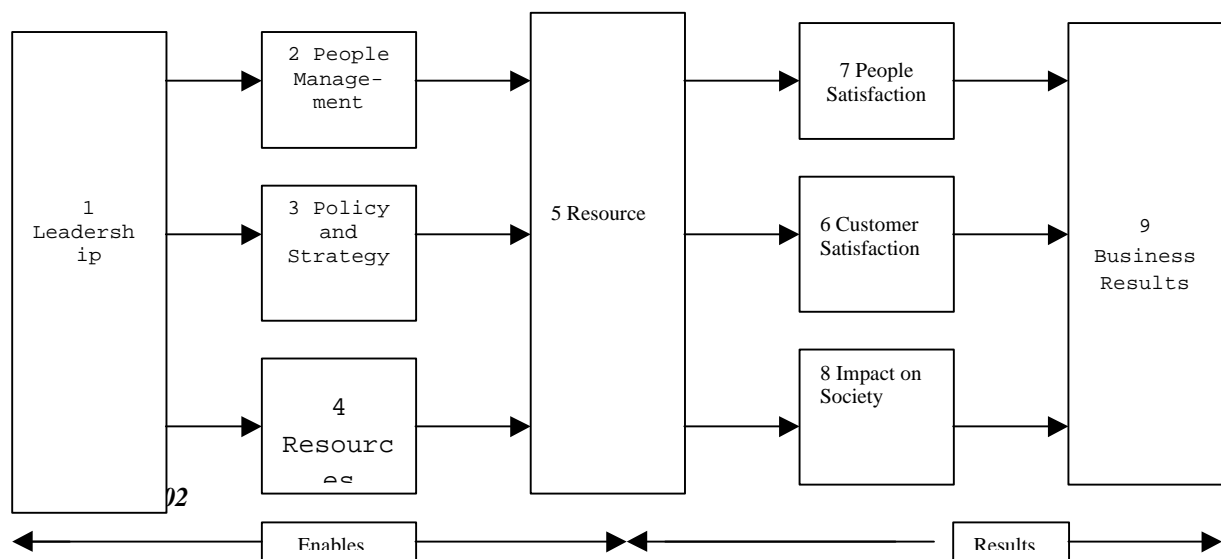
21. It enables organisations to carry out diagnostics assessments, which concentrate on the key processes and identify critical areas for improvement with corresponding action plans. In this respect the guide can be seen as supportive of organisations wishing to adopt specific quality initiatives such as ISO9000 and the EFQM Excellence Model.

EFQM Excellence Model

22. The EFQM Excellence Model is one of a number of quality management models that provide an integrated structure for co-ordinating and integrating specific quality initiatives. It helps to measure achievements and to identify areas of relative weakness and is often used as a method for benchmarking against other similar organisations. The EFQM Excellence Model has a broad focus and unlike, say ISO9000, is not concerned with processes alone, rather it takes an overview of the organisation, the way it is structured, its ethos and its ability to deliver quality products. The model was developed by the European Foundation of Quality Management.

23. Underlying the EFQM Excellence Model is the realisation that business excellence measured through customer satisfaction is achieved through an effective leadership, which drives policy and strategy, allocates resources compatible with that policy and manages employees to manage the processes. This is shown in diagrammatic form below.

EFQM Excellence Model



## ISO 9002

24. The International Standard ISO 9000 is an international quality standard for management systems. A quality system is a common-sense, well-documented business management system that is applicable to all business sectors which helps to ensure consistency and improvement of working practices, including the products and services produced.

25. There are currently 3 International Standards dealing with quality system requirements that can be used for external quality assurance and accreditation purposes. For the UK RPI, we have chosen ISO 9002, as the system relevant for use when conformance to specified requirements is to be assured by the supplier during production, installation and servicing.

26. These standards are to be revised for the year 2000 to give users the opportunity to add value to their activities and to improve their performance continually by focussing on the major processes within the organisation. They will result in a closer alignment of the quality management system with the needs of the organisation and reflect the way those organisations run their business activities. It will therefore come more into line with TQM and the EFQM Excellence Model.

### **III. Case Study 1: Australian Bureau of Statistics benchmarking exercise of consumer price indices**

#### Objectives

27. The objectives of this exercise were fourfold:

- to compare efficiency of delivery between national statistical institutes;
- to identify areas of best practice and learn from the experiences of other institutes: so that
- "value for money" could be demonstrated;
- performance could be improved.

28. Three countries participated: Australia; New Zealand; and the United Kingdom.

#### Performance measures

29. As a first step a small set of critical measures that best reflected the performance of the processes and outputs were identified under three headings:

- **quality** measures, which examine the statistical quality of price collection;

- **effectiveness** measures, which measure the relevance of outputs to customers (through client satisfaction surveys);
- **efficiency** measures, which measure the unit costs of production.

30. It should be noted that all these measures relate to **quality** in the broader sense- see definition in chapter introduction.

31. Once agreed these measures were then interpreted in the context of the production of consumer price indices, using process mapping to identify critical core processes common to each organisation, and relevant performance measures were developed. Performance measures were chosen not only to reflect business objectives but also the need to have measures which were simple to measure and easy to interpret and ones where the results could not be manipulated or lead to oblique actions or conclusions. The process mappings themselves, which provide a diagrammatic representation of working arrangements and the inter-relationships between different parts of the production cycle, were regarded as useful tools for the evaluation and interpretation of the benchmarking findings. Further details of the performance measures are given in the table below and an example of a process mapping for the UK RPI is given at Annex A

#### **RPI Performance Measures**

##### 1a Response rate

month	total quotes	missing prices	seasonal items	missing price seasonal items	% prices collected
99_03	132017	16036	5830	707	87.85%
99_04	132272	16276	5814	851	87.70%
99_05	128838	16090	5684	719	87.51%
				AVERAGE	87.69%

##### 2a Imputation rate

month	total base prices	imputed base prices	% imputed base prices
99_03	119050	3565	2.99%
99_04	123153	5036	4.09%
99_05	125753	3708	2.95%
		AVERAGE	3.34%

##### 3a/b Audit of prices

month	% price failures	% indicator failures
99_02	1.40%	1.70%
99_03	1.40%	1.50%
99_04	2.80%	1.90%
AVERAGE	1.87%	1.70%

4a Quality adjustment

year	Quality adjustment
1999	0.32%

5 Maintenance and review

Negligible effect - weights are only altered on an ad-hoc basis if sub-items fall out of the Index. As the changes are made on an ad-hoc basis, any measure would not be truly Representative or useful.

6 Currency of expenditure weights

= mid-point of RPI design - mid point of the Family Expenditure Survey  
= 99\_07 - 98\_01  
= 18 months

7 Timeliness of release

a = end of reference period - release of data  
= 16 days (1999 average)  
b = end of data collection period - release of data  
= one month ( as both collection day and release of data fall on Tuesday, this period will Always be exactly four or five weeks depending on the number of Tuesdays in the month)

**RPI Performance Measures notes**

1a Response rate

The number of goods where a Price is out of season has proved difficult to calculate within the RPI as when a seasonal good is out of season, The collector will pay no attention to it and no mention of it can be found on RPI's databases  
Figures are shown for the most current available months in both cases.

2a Imputation rate

For the RPI, if an item has a zero price, it is excluded from the index for that month, no actual prices are imputed. Base prices however are imputed and the results reflect to what extent this occurs.  
Figures are shown for the most current available months in both cases.

3a/b Audit of prices

Figures are shown for the most current available months in both cases.

4a Quality adjustment

Only personal computers are currently explicitly quality adjusted in the RPI and are weighted. New cars are quality adjusted But have a zero weighting. Impact of implicit quality adjustment not covered.

#### 5 Maintenance and review

Negligible effect - weights are only altered on an ad-hoc basis if sub-items fall out of the Index. As the changes are made on an ad-hoc basis, any measure would not be truly Representative or useful.

#### 6 Currency of expenditure weights

18 months is generally correct for all items in the RPI except some housing items where the Family Expenditure Survey is conducted over three years instead of one.

#### 7 Timeliness of release

Publication dates are confirmed three months in advance but generally both (a) and (b) are correct.

### Method of working

32. The method of working has been defined in terms of comprehensive metadata which details how each area of study (in this case the participating NSIs consumer price indices) are collected, processed, released and disseminated. It also includes technical data such as:

- the enumeration
- the number of items selected
- their classification and how they are reviewed
- sampling
- scrutiny checks
- imputation etc

### Summary of results

33. It is far too early to provide even a broad indication of the conclusions to be drawn from this exercise as the evaluation process is still in its early stages. However, it is clear that the benchmarking exercise has identified some interesting differences in practices between the three national statistical institutes involved. It is hoped to further report on these at the November meeting in Geneva.

### Project evaluation

34. Undertaking a benchmarking exercise requires forward commitment and can involve considerable effort by those involved. In order to ensure success it is therefore important when entering into such an exercise that:

- the exercise is tailored to the requirements of the national statistical institutes involved;

- the individual requirements of the partners are mutually compatible and this is reflected in clear goals;
- these goals are fully shared by all participants and are reflected in an agreed project plan with timetable;
- there is a proper allocation of resources for the project based on a realistic assessment at the start of the total resources required;
- partners fully subscribe to the process of learning by sharing and one which is learner-centered rather than teacher-centered;
- confidentiality and other related security or personal issues of individual member NSIs are observed.
- there is mutual trust and respect between partners.

#### **IV. Case Study 2: Quality management and auditing of the monthly processing of the UK Retail Prices Index (RPI)**

##### Historical background

35. The catalyst for the development of a Quality Management System for the Retail Prices Index was the market testing of price collection and the award of a contract to a private sector company. Prior to that date the collection of prices from shops was carried out by staff at local employment offices who in between carrying out their normal duties would visit a purposive sample of shops in their locality once a month and manually collect prices for a range of pre-selected items. The latter was not a contractual arrangement and this was seen as a disadvantage. Anecdotal evidence together with knowledge of private market research activity indicated that the quality and timeliness of the RPI could be improved and increased value for money obtained. Thus it was against this background that ONS took the opportunity not only to review service delivery but also quality management arrangements. Market testing provided a discipline for establishing user need and what level of service was required as well as a mechanism for contracting out to a data supplier for whom data collection was a "core" business. The ability to improve quality was greatly enhanced amongst other things by better documentation, better sampling and also computerised data collection. The latter significantly increased the scope for auditing of price data in the field at time of collection and prior to receipt in Head Office and also better facilitated the management of operations through timely production of management information. It will be seen in the paragraphs that follow that computerised price collection underpins quality management of the RPI.

##### The Quality Management System

What is the RPI and how is it measured?

36. The RPI measures the change in the total cost of an imaginary shopping basket of goods and services which people typically spend their money on. The

content of the basket is fixed each January for a year at a time but as the prices of individual products vary over the year so does the total cost. About the middle of every month price collectors with portable computers and acting on behalf of ONS obtain about 120,000 prices for about 500 specified goods and services sold by a variety of shops covering 146 locations throughout the country. Data is also collected centrally from certain retailers with multiple outlets and for some standard indices, so that around 135,000 prices are collected in total each month. These are then collated and sent to ONS where they are checked and processed and then weighted together to ensure that the index reflects the relative importance of the various items in the shopping basket and the amounts that are spent in different regions of the country and in different shops. The index is published four weeks later to a pre-announced date. This is an extremely tight timetable with very little leeway. It is therefore important that the quality management system provides a timely audit trail and that mechanisms are in place to effectively respond to pressing operational problems that may arise. However, equally important was the need to ensure that there were adequate controls for less frequent processes such as the annual update of the shopping basket and that quality not only addressed day to day operational issues but also the potential for longer term improvements. Thus underlying the approach adopted was the concept that quality was about improvement and that it was a continuous process.

#### The RPI Quality Improvement Programme

37. The re-engineering of the RPI previously referred to consisted of three main elements:

- redesign of sampling and index data collection and production arrangements. This included a move from purposive to random sampling, contracting out and the introduction of computer assisted data collection in shops;
- more effective central collection of prices from public utilities and large supermarket chains and department stores, for instance moving over to central collection for more outlets and greater use of electronic transmission;
- the introduction of more effective quality management system with, for example, contractual targets and formal auditing

This case study focuses on the formal Quality Management System.

#### Overview of the Quality Management System

38. With the above in mind the decision was taken that the Quality Management System for the Retail Prices Index should cover activities relating both to validation of the production cycle itself, a monthly auditing of the price collection process in the field by independent observers and an annual review process which focuses more on strategic and

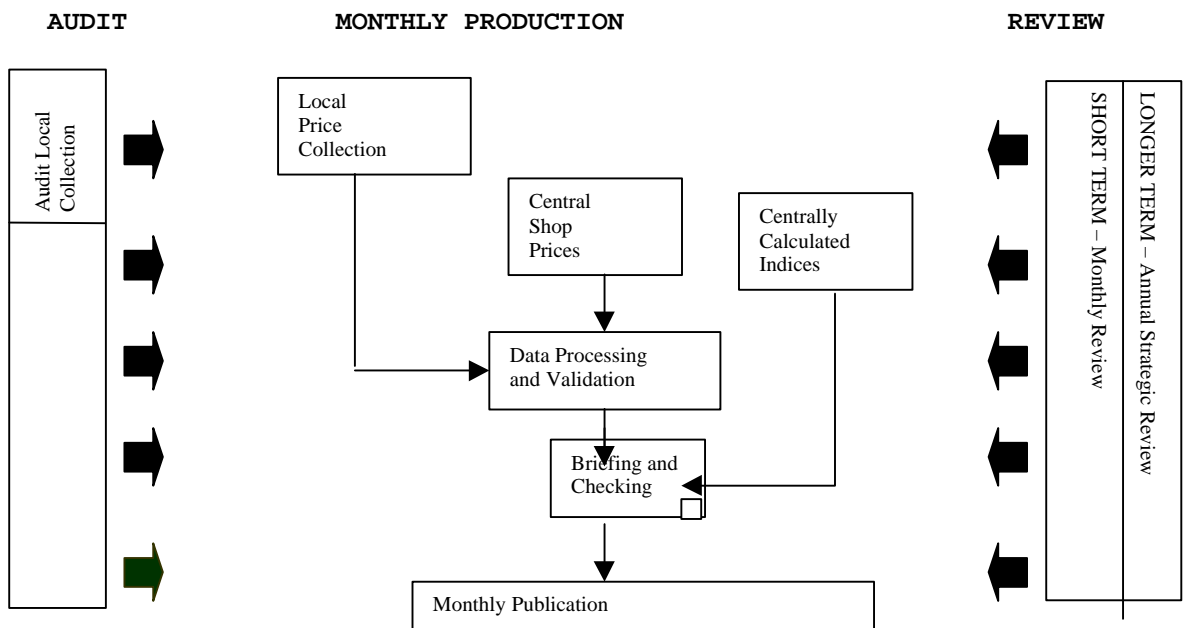
longer term issues. The latter involves learning from past experiences and identifying and taking forward actions, which will improve future quality.

39. The Quality Management System adopted for the RPI has been designed to meet the International Standard ISO 9002. ISO 9002 states that "The supplier shall establish, document and maintain a quality system as a means of ensuring that the product conforms to specified requirements". The view was taken that whilst ISO 9002 did not set standards or guarantee quality it did provide a readily available framework within which quality could be continually improved. In addition it was internationally recognised.

40. A conscious decision was taken not to include technical development work, such as the introduction of better sampling or data sources, or the annual review of the basket as what would have been gained by covering more processes would have been lost in loss of focus and the difficulty of drawing together very different processes.

41. Restricting the scope of the formal quality management exercise using ISO9000 as the management tool for auditing also meant that the scrutiny focused on those areas either contracted out as a result of market testing or heavily affected by contracting out. This was seen as an advantage as contracting out had focused on those key activities where quality had been identified as a key concern and issue and where with the resulting adoption of handheld computers the process had undergone a transformation in terms of data collection techniques. Thus ISO9000 was also seen as providing input into a post-evaluation exercise of the benefits of contracting out. In the longer term it would also provide a key input into any re-negotiation of price collection contracts.

**RPI Quality Management System**



#### Key Features of RPI Quality Management System

42. There are three specific features of the RPI Quality Management System, which it is worth drawing to the attention of the reader:

- **defining standards.** It is up to managers in conjunction with input from users to define standards. This includes defining what we do and how we do it. This is a general rule which can usefully applied to other circumstances. But note that those involved in the production process have a useful role given their detailed knowledge and experience of the production process;
- **describing the processes.** To describe the processes requires standardised and quality assured documentation which is accessible to all. It is important that this documentation must be completed by those actually undertaking the processes ;
- **producing the evidence.** Auditing arrangements need to be in place to ensure the processes are carried out properly and to a satisfactory conclusion

#### Key aspects

43. The above features underline all aspects of the RPI Quality Management System. The key aspects of the system are threefold. Each aspect should be seen as inter-dependent and an integral part of the whole:

- **documentation of the monthly production processes** from the collection of prices to the data processing to publication of the index;
- **auditing** of local price collection and the monthly production process;
- **a regularised review system**, which focuses both on the monthly production process and longer-term issues.

#### Documentation of the Monthly Production Process

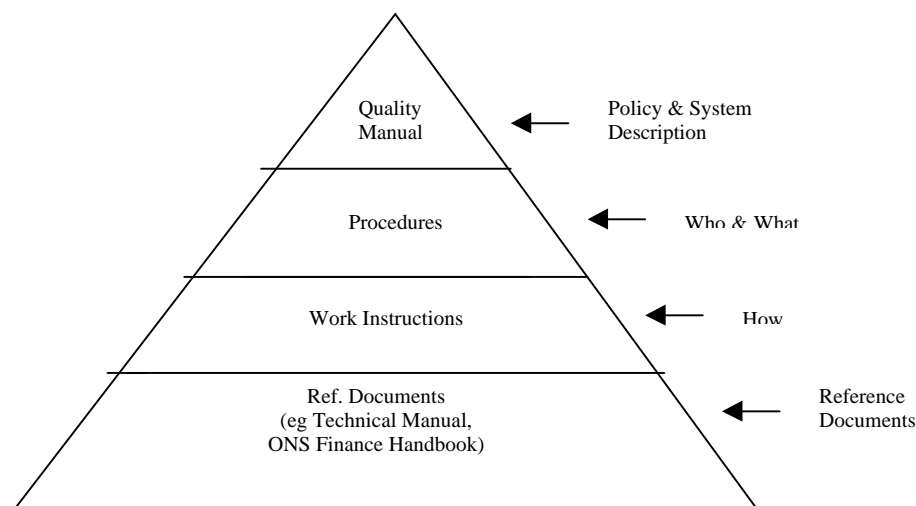
##### Documentation structure

44. A key element of the RPI Quality Management System is that all aspects of the monthly production cycle are not only documented but also quality assured. There are four levels of documentation:

- **the Quality Manual** which defines quality in the context of the index and also gives an overview of the quality system including management organisation;
- a description of the **Procedures**, in particular the monthly production cycle including division of responsibilities;
- **the Work Instructions** which give precise details of how tasks are to be undertaken;
- **other reference documents** including publications such as Technical Manual

45. Quality assurance ensures the accuracy, relevance and effectiveness of the documentation and also helps to identify training needs.

#### Structure of RPI Documentation



#### The benefits of documentation

46. The benefits of good documentation were perceived to be wider than providing useful reference documents for the training and induction of staff. Documentation, especially at a higher level added to the integrity of the index by providing transparency to methodology and procedures and also added to user understanding. From a management viewpoint it provided an opportunity to introduce a more standardised approach to work both in terms of processes and methodology and also provided a means of knowledge sharing to assist with staff cover.

47. Just as importantly the process of documentation itself provided a mechanism for the quality assurance of index compilation processes and methods.

48. As a result of this exercise a number of reference documents have been produced. This includes a Quality Manual, which defines quality policy and provides a general description of the Quality Management System. It is worth noting that this has been produced with full involvement by those involved in RPI production. As such the production team owns it. In addition a set of mandatory procedures have been compiled which identify individual responsibilities thereby increasing team understanding of roles and interrelationships between different team members. The latter has been augmented by detailed work instructions on how individual tasks should be carried out. In addition ONS published for the first time a Retail Prices

Index Technical Manual aimed at users who wanted to know how prices data is collected and aggregated into an index. This is published "print on demand" which accommodates regular updating and was found to be the most cost-effective.

#### Training and Investors in People

49. Investors in People (IiP) is an externally recognised national standard that sets a level of good practice for improving an organisation's performance through its people. Its key principle is that businesses cannot succeed in meeting their business goals unless they develop their people sufficiently to meet their aims. Therefore there needs to be a two-way link between business plans at every level and training and development plans for the employees who have to deliver the business. The procedure of documentation gone through as part of the Quality Management System has helped identify training needs and these have been incorporated into the personal development plans of individuals and in-group Training Plans. In addition more effective pre-training and post-training evaluation procedures have been introduced which help to monitor the quality of training and its value against business needs and also provide an important input into quality management. Thus IiP has been identified and used as an effective "quality" tool in the context of the RPI Quality Management System and ISO 9000.

#### The use of Lotus Notes

50. Lotus Notes was recently introduced as standard software in the organisation and has been identified as an additional tool for improved quality management particularly in the context of documentation production and dissemination and its control. The benefits are seen as threefold:

- **much more efficient production** of documentation as it helps with initial compilation and reduces the need to print and circulate paper copies;
- **better informed staff** because they have immediate electronic access to latest documentation including desk instructions with search facility by subject and author;
- **better quality control**, as access to non-authors is restricted to "read only".

Exploitation of Lotus Notes is in the early stages and the benefits will be monitored closely.

#### Auditing

51. The auditing of the monthly production process is carried out by a dedicated Quality Management Branch with no operational responsibilities. The auditing is planned so that each aspect of the monthly production cycle is audited at least once a year. This includes an independent audit of local price collection where ONS auditors accompany private sector price collectors

in the field and also carry out random past-hoc checks to see if the collectors reach the high level of accuracy to be achieved as part of the contractual requirement. The latter, including the provision of monetary incentives in the contract have proven to be effective quality tools.

#### Audit of local price collection

52. 10 part-time regionally based collectors employed directly by the Office for National Statistics carry out auditing of local price collection. There is a system of accompanied collection plus post hoc checks.

53. Every month each ONS auditor accompanies a sample of price collectors out in the field when they are collecting prices. The latter are partly chosen on a random basis supplemented by selective visits to those collectors where other feedback has revealed reason for concern. Experience would indicate that selective visits would be most effective for identifying and rectifying quality problems in the field. However, random visits are necessary in order to produce monthly performance indicators, which measure whether contractual obligations of the price collection company are being fulfilled. It is mainly because of the latter reason that the post hoc checks are carried out at random.

54. The main purpose of these audits is to ensure that each collector is following the procedures laid down for price collection so that:

- the **risk of errors** is reduced;
- **contractual obligations** are monitored;
- **standards of accuracy** are maintained

55. But it is also important to recognise other benefits which ensue and are of greater strategic importance in terms of continuous quality improvement. These are:

- **raising awareness** of quality;
- **identification of the scope for introducing improvements** to quality including rectifying weaknesses in procedures and documentation and also in price collection skills.

56. The accompanied collection focuses on reducing the risk of errors and of highlighting general or individual training needs. For instance, action points may relate to inadequacies in guidance notes or the skills of particular collectors and appropriate action such as the release of revised field instructions and refresher training for certain collector will be initiated and outcomes monitored. Problems with individual collectors maybe followed up with the contractors regional supervisor or Head Office. This accompanied checking is in addition to in field price validation that is programmed into the handheld computers used for data collection. The latter involves a computer programme, which pre-specifies by item and for non-sale

periods the limits of the allowable percentage change in price each month. Where a price change exceeds this limit the programme will require the re-entry of the price in case of an incorrect input and an explanation if the actual price change is over the allowable limits.

57. The random post-hoc check involves ONS auditors re-pricing a random selection of items in a random sample of locations to see if the error rate is within the 5% allowed in the contract and that it is not systematic and therefore lead to bias in the index. It focuses on raising awareness of quality both amongst individual price collectors and within the contractor organisation and in ensuring contractual obligations are met.

58. The post-hoc audit is carried out within two working days of the original price collection and each month covers about 70 uniquely defined price quotes using detailed product descriptions and shop codes. A number of **quality indicators** are measured:

- a **pass mark**, which defines the maximum number of incorrect price quotes, allowed in each location to adhere to contractual obligations. Conversely incentive payments are offered where the contractor delivers an error rate significantly below the maximum. Thus there is an in-built mechanism for continuous quality improvement by the contractor;
- a **subjective assessment** of item descriptions and also other information useful for quality control and monitoring such as whether a price is a sale price. This type of information is routinely recorded by price collectors and is important to sustain comparability over time when prices may fluctuate or where old items disappear from the shelves of shops and are replaced by new ones. Auditing arrangements allow greater fluctuation in prices where there is a sale price involved.

59. The latter indicator is not used as a performance target as such because it is too subjective but it has nevertheless proved valuable information for quality management of price collection particularly for training of the fieldforce. More recently it has also been the focus of a pilot exercise to measure the representativity of the selection of items priced in the index, in particular whether the method by which price collectors are asked to price a "representative brand" of a particular item is leading to systematic bias.

#### Reviews

60. Quality is defined as "continuous improvement" and as such it is important that outcomes are reviewed as part of the forward planning process. It is for this reason that short-term and longer-term review procedures are put in place.

## Quality Days

61. A Quality Day is held towards the end of each month when the production team focuses on quality issues, which have arisen in recent months including a review of the operation of the most recent production cycle. When these days were first introduced a few years ago they were fairly formal and invariably involved all team members gathered together whether or not the issue being addressed was of particular concern to them. However feedback from team members has led us to re-evaluate our approach. It is now far more flexible and includes a general session where management gives feedback to staff, including a monthly report on performance covering ONS and the price collection contractors, and where team members have the opportunity to raise particular concerns. Just as important, this is followed by smaller ad-hoc groupings of staff brought together to tackle particular issues of mutual interest. Seminars and presentations are included where appropriate.

62. The Quality Day also includes a forward look at issues arising over the next cycle so that appropriate working arrangements can be put together. Thus the focus is both on learning from past experience, for example to avoid problems repeating themselves, and on anticipating future issues for forward planning.

63. Action points are recorded and individuals identified to follow them through.

## The annual planning round

64. The longer-term element of the quality review system focuses on a higher level strategic look at objectives and how they are going to be achieved. This review is conducted as part of the annual planning cycle and addresses not only the quality of outputs assessed against user needs but also the processes by which quality is going to be achieved. The latter is now formally laid down in an annual Quality Management Action Plan, which is an annex to the main Business Plan. The Quality Action Plan will normally incorporate a vision of quality and the processes to be used to achieve it. For instance, the Quality Plan for the RPI includes a commitment to using monthly Quality Days to promote quality and to seek ISO9000 accreditation in 1999. Also included is a forward commitment to a benchmarking exercise and a self-assessment against the EFQM Excellence Model.

## EFQM Excellence Model & Benchmarking

65. Unlike ISO9000 which focuses on processes, the EFQM Excellence Model takes a whole business perspective and provides a diagnostic framework rather than a diagnostic tool in its own right. In this respect it usefully complements ISO9000 and will be used to measure performance against pre-selected criteria weighted to take account of the relative importance of each in the context of producing the monthly RPI. This is further complemented by

participation in an international benchmarking exercise involving the identification and learning from examples of best practice in consumer price index production in other national statistical institutes (see first case study).

#### Benefits of a Formal Quality Management System

66. There were a number of reasons why it was decided to implement a formal Quality Management System and to eventually seek ISO 9000 accreditation. The ONS experience of working towards ISO 9000 accreditation points to a number of benefits:

- it has given a necessary discipline in clarifying and specifying production procedures and documenting them more fully;
- ISO 9000 provides a ready-made model for documentation and quality control;
- it adds necessary controls, in particular it provides a framework for the initiation, evaluation and implementation of changes and minimises the risks of errors;
- it provides a basis for more effective staff training including induction of new staff;
- ISO 9000 will increase public confidence in the RPI.

67. However, it is also strongly believed that ISO 9000 accreditation should not be a goal in its own right. More importantly for the integrity of the product are the lessons to be learnt whilst going through the processes leading up to accreditation.

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**ANNEX A) Process Map : UK RPI Monthly Production**

