

Engineering Informations Management: Standards and Specifications

– Assignment – Principle of Controlled Documentation

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Abstract

This report gives an overview about controlled documentation cohesive with quality management (QM) and quality management systems (QMS) respectively. Special attention was spent on small companies but there is not so much difference to larger companies in terms of QM and QMS. The (new) computer and information technology (like computer networks) makes QM affordable for everyone.

This report was written as an assignment for the lecture 'Engineering Information Management: Standards and Specifications' at the London South Bank University (LSBU) with Kate Viscardi.

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1 Introduction

Quality Management is becoming more and more important because today's customers want high-quality-products as cheaply as possible. Products which are only cheaply are no longer asked for. But what is Quality? Quality can be defined with delivering what is required (by the customers) in time. (Adapted from Munro-Faure et al 1995, ISO 9000:2000, and Ansell 1993) It is necessary to manage the process of production¹ in a good way, to meet the high-quality-standards at low prices. This Management process is called 'Quality Management' (QM). A Quality Management System (QMS) is a complete system of rules and procedures which describes how to manage quality.

There are a lot of facilities to support companies in their Quality Management. One of the biggest support-systems is the ISO9000, a international standard series. The ISO9000 defines the guidelines for Quality Management. It does not deliver a complete solution (Tricker 2001). The guidelines need to be implemented and adapted for every special single case. There is no major difference between small and bigger companies (Tricker 2001). Many books about ISO9000 are available, and supporting the implementation and adaption by giving interpretation, explanation, and examples.

To prove that the process of production is high quality, quality accreditation is carried out by official organisations such as the British Standards Institution (BSI). After the production process is checked and complains with ISO9000 (or BS5750²) a seal of approval is given and can be used for advertising. In this way the customers obtain knowledge about which companies using a high-quality process to produce and deliver their products and services. (BSI, 1990)



Figure 1: Seal of Approval from the BSI (Saint-Gobain Pipelines 2003).

¹This means the complete process (including production, delivery, service, maintenance)

²This is the British standard, which complains with ISO9000. The ISO9000 was developed from national standards like this.

2 Documentation

Documentation is an important part of a Quality Management System. For this reason one part of the ISO9000 describes what documentation should be included and gives a framework for managing and controlling documentation.

Documentation is in the broadest sense all data which is meaningful and written down³ (Adapted from ISO 9000-1:1994). That can be, for example, work instruction, a contract or the results of a quality test or audit.

“A Quality Management System will only be effective if it is documented, understood and followed by all employees.” (Munro-Faure et al 1995 p55) To achieving this it is necessary that all procedures and processes are defined. In Addition these definitions must be available and understandable to all users in form of documentation so that everyone knows what s/he have to do (Clegg 2003, Munro-Faure et al 1995).

The documents in a QMS can be sorted into four levels (Jackson and Ashton 1995, Adapted from Munro-Faure et al 1995, Tricker 2001 and strategis.gc.ca 2000). The number of documents increases with the level. Note that this should give an idea, the levels do not have strict boundaries. There are a lot of difference between the interpretations.

1. The quality **Policy** is a document which should give an overall overview about the business and the applied QMS. This level is also named Quality (Policy) Manual.
2. The process **Procedures** level should contain concrete information about in which way the Quality Policy is met. ISO9000 requirements in this level are procedures for process and design control, contract review, records, training, inspections and tests.
3. The **Work Instructions** describe how activities within a process have to performed.
4. **Quality Records** are tools to help process the work instructions and the outcomes of these processes. For example template forms and completed form about quality tests.

³or stored in other ways on a (supporting) medium

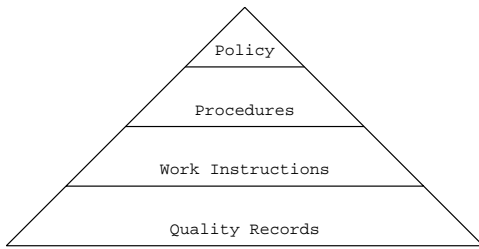


Figure 2: The pyramid of documentation: Illustration of hierarchy of documents. (Adapted from Munro-Faure et al 1995, Jackson and Ashton 1995, and strategis.gc.ca 2000)

3 Controlled Documentation

A huge number of documents are necessary to maintain a Quality Management System. It is necessary to control the documentation to prevent chaos. To run a high quality process it is necessary for everyone knows what they have to do, when they have to do it, and how it is to be done. Therefore up to date documents has to be available for anyone all the time (Clegg 2003, Munro-Faure et al 1995).

3.1 Issuing Documents

Before each document can be issued it must be clear who needs it and who should receive a copy of it. It is important to find a way to keep the golden mean between minimising the number of documents on the one, and the necessary number of documents for each person on the other hand. (Munro-Faure et al 1995) If the number of documents increases, the effort which is necessary to control these documents is increasing as well. In addition to this, more documents result in more mistakes with their handling (Munro-Faure et al 1995). For example, it is simpler to have an overview over three documents than over 20. The possibility that one of three documents is forgotten is much less than one of 20. So the number of documents should be minimised but the access to these documents must be possible. It is may possible to provide the some of these documents in public places such as blackboards or common rooms. In this way, anyone can have access to the documents but does not need a own copy. In small companies one copy of a document is may be enough for the whole company.

All documents must be read and understood (Munro-Faure et al 1995). It makes no sense to produce documentation if nobody reads it or if it cannot be understood by everyone. For this reason there must be a feedback-channel. For example, everybody who is on a list for a document, has to sign that s/he has got and understood the document. This channel should be open for any comments, ideas or complaints. In plain English: “Using everybody’s ideas and expertise” (Thorn

1991 p20). Regular audits can be used to increase communication and determine if all information inside the QMS is understood well and helps to deliver high quality.

3.2 Responsible and Changes

It must be clear who is responsible for any document (strategis.gc.ca, 2000). Any document needs somebody who is responsible for it. This person⁴ has to make sure that necessary changes are applied to the document. Be aware that this person has to have the ability and the authority to make final decisions about the document's content. This person authorises both the original document and any change by signature. (Clegg 2003)

Tricker (1991) proposed a slightly different way to authenticate documents in his Example Quality Manual. It is distinguished between author and authorising persons (in this case **Managing Director (MD)** and **Section Director (SD)**). The SD and the MD make all decisions. The author only produces the document on the basis of this decisions and has to ask the MD for a final acceptance. The flowchart also point out that all documents have to sent to the **Quality Manager (QM2)** who does the QM.

⁴There are may be more than one person responsible for a document.

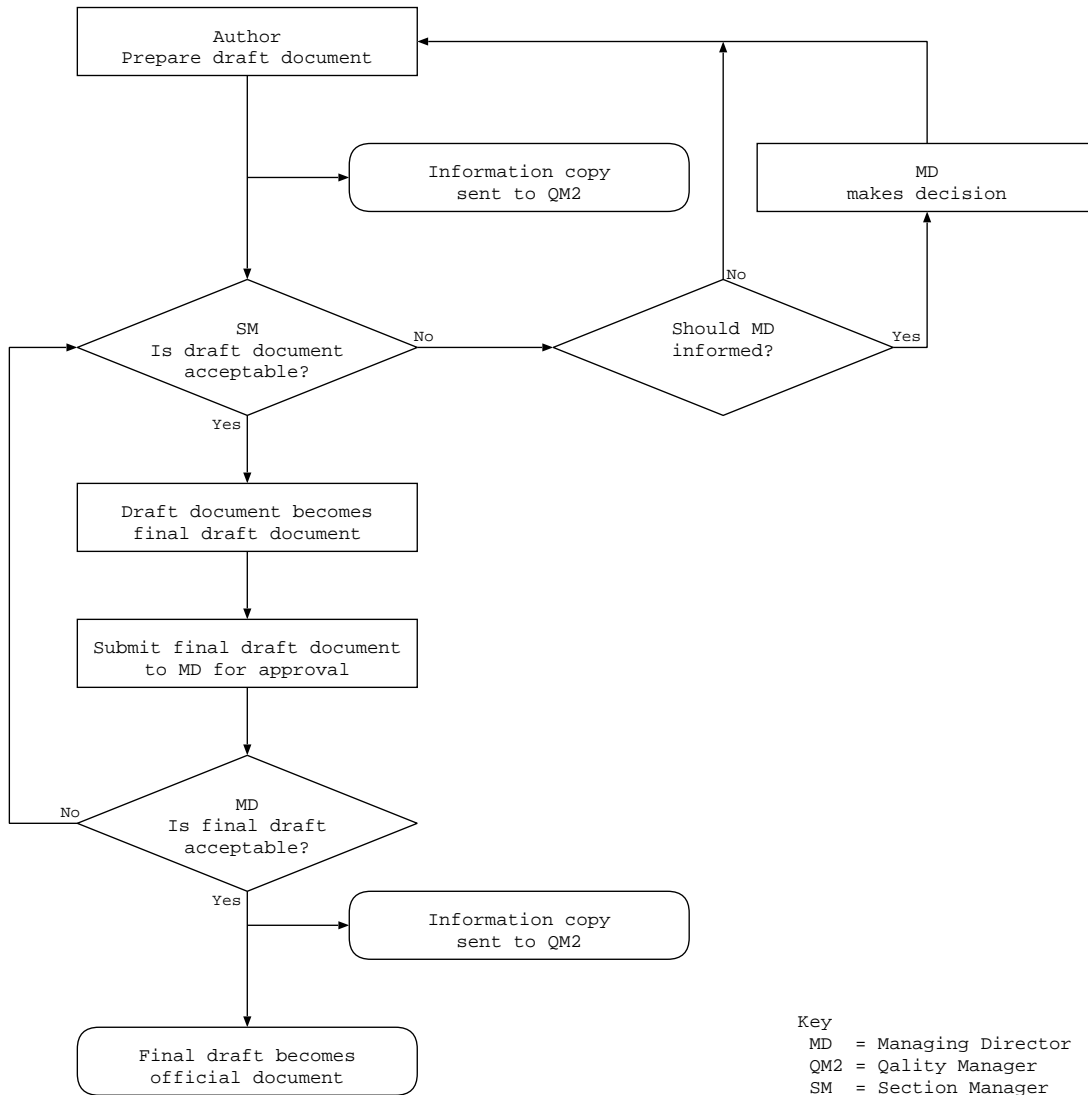


Figure 3: Example of a procedure for authorising (approval) of a document. (Adapted from Tricker 1991)

Everybody must be sure that the document was authorised by the right person, it must be clear who is responsible for which document. All information which is necessary to be sure about this (Title, unique ID number, version, who is responsible, date of first and last issue) can be stored in a document, called master list. The master list has to be controlled itself. (Clegg 2003, Munro-Faure et al 1995)

Keep record of all documents. All changes to controlled documents have to be documented itself (strategis.gc.ca, 2000). In addition to this, all versions of any document must be “archived [legible and incorruptible] for historical and legal

reasons” (Clegg 2003) This is important and should provide the proof that the QMS operates effectively. (Clegg 2003, Munro-Faure et al 1995)

3.3 Delivery

There are two main ways to deliver a document and make sure that all points under **issuing documents** are taken in account. The first is, that a central office controls the document. This office takes care that all documents are delivered and controlled. All changes have to be sent to this office. In the second scenario the responsible person takes care of the delivery and the control of all assigned documents (Munro-Faure et al 1995). A central office cannot be afforded by most small companies. For this reason the second option is more common in this companies. This method can spread the workload for the QM on more than one person. On the other hand, it may have the result that the process is less consistent (Munro-Faure et al 1995).

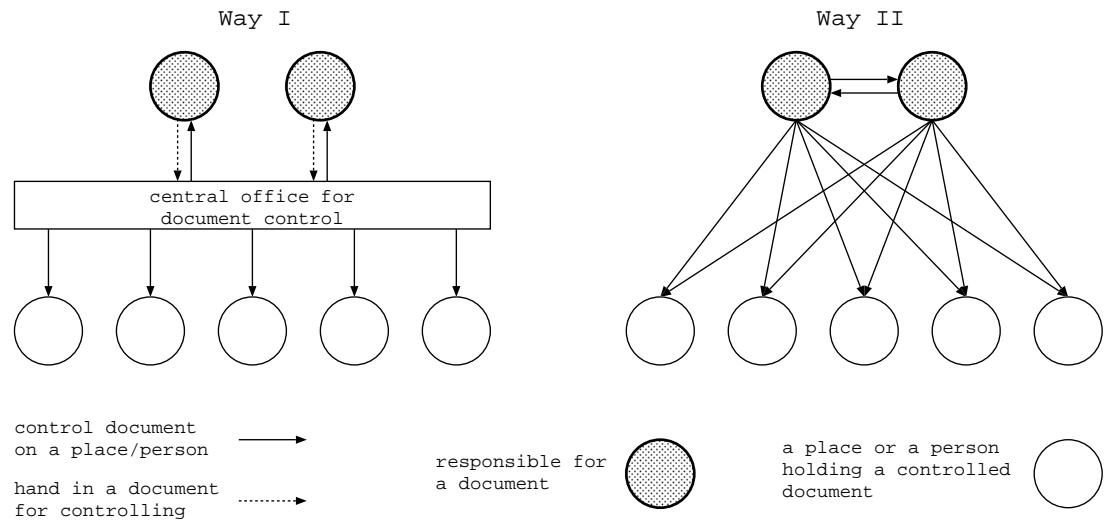


Figure 4: Visualisation of the two different ways of delivering and controlling a document.

It must be ensured that all old documents are withdrawn from the circulation (Clegg 2003). Nobody should work with old documents. Munro-Faure et al (1995) pointed out, that it is a effective way to remove obsolete documents in the same way and at the same time as new documents are delivered.

3.4 Layout

The layout of the documents should be similar because this makes it easier to follow the document. A similar structure helps to find a particular piece of information in a document because it is always in the same order. That reduces the possibility of mistakes (Munro-Faure et al 1995, strategis.gc.ca 2000). Do not use more detail than necessary, “use simple, clear language, with short sentences” instead (strategis.gc.ca 2000 p58 (p2 in PDF)). Every document must be clearly identifiable. If every document has a unique identification (ID) number and a version number, it can be referred unambiguously (Tricker 2001, Munro-Faure et al 1995). Use section numbers instead of page numbers for referring, that makes the documents easier to change (strategis.gc.ca, 2000). It is important, that it can be checked simply if the document is complete (all pages are present). This can be simple provided by numbering the pages. For example “‘1 of n’, ‘2 of n’, ‘3 of n’ and so forth” (Munro-Faure et al 1995 p144), or $1/n$ (Jackson and Ashton 1995). n is equal to the total number of pages of the document. All the mentioned details should have a suitable place in the documents. Tricker (2001), for example, recommend a Document Control Sheet for every document, which contains: document title, version block, date, file number, number of pages, abstract, approval control block (signature of managing director and date).

Document Control Sheet

Title Herne European Consultancy Ltd – Part 3 – Quality Procedures	Version 00.05	Date 31.12.00
	File Number H-QMS-031AH4	No of Pages 84

Abstract
 This Herne European Consultancy Ltd's Quality Management System is divided into four parts. This document is Part 3 and describes the Quality Procedures that have been designed to meet Herne European Consultancy Ltd's Quality Process. The work Instructions associated with these Quality Procedures are detailed in Part 4.

Name	Function	Level
Max Mayer	Quality Manager	Prepare
Bernhard Mayer	Section Director	Agree
Andreas Hofmeier	Managing Director	Approval

Keywords
 Distribution, Document, Document control, File number, Filing, Quality Procedure, Storage

Approved

Date: _____

(Managing Director)

Figure 5: Example of a Document Control Sheet. (Adapted from Tricker 1991)

3.5 Computer Support

Since the 1980s the computer has become more and more important in document management systems such as QMS (Clegg 2003). Today the computer technology is available for nearly everyone, because of the dramatic fallen prices. Today's document control software provides many more functions than required by the ISO 9000 (Clegg 2003). This technology is becoming more integrated in standard computer applications like office applications. This makes the usage of this kind of system easier (Clegg 2003). It is important that the documentation, which is stored in computers, follows also a standard. The file format and the file-system-structure⁵ should for example specified (Tricker 2001). Tricker (2001) pointed out that e-mails and other documents of communication must be controlled as well and give same examples in his Example Quality Manual.

4 Conclusion

The new information technologies make high quality management affordable for everyone. These technologies provide the flexibility which is needed to serve the purpose of managing documentation for constantly changing requirements in a fast changing environment (market). Small companies are not longer excluded from high quality documentation management systems.

There are a lot of aids and other materials in form of examples and explanations of the ISO standards available. Many books, for example Tricker (2001), give a complete example of an Quality Manual. Such examples can be simply adapted and are applicable for almost every company. For this reason it is possible to obtain the first level of documentation quite easily, so no company (also the smaller ones) need to create the QMS from scratch. The other three levels of documentation cannot adapted so similar because these are too special. Small companies have the advantage, that there are no so much documents needed for this levels, because of the simpler structure. Therefore a small company should not have problems to adapt a QMS.

⁵This is the structure of directories (may be on a server) in which the files (documents) are sorted

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6 Annex: Word Count

The word count and readability analysis was made with `style`, a program which “analyse[s] surface characteristics of a document” (Cherry and Vesterman, 1998). The parts Bibliography, Contents, Annex: Word Count and the figures are excluded from this analysis.

readability grades:

Kincaid: 9.7
ARI: 10.3
Coleman-Liau: 13.1
Flesch Index: 56.1
Fog Index: 13.4
1. WSTF Index: 2.0
Wheeler-Smith Index: 27.9 = school year 7
Lix: 45.8 = school year 8
SMOG-Grading: 12.1

sentence info:

11258 characters
2297 words, average length 4.90 characters = 1.58 syllables
133 sentences, average length 17.3 words
39% (53) short sentences (at most 12 words)
12% (17) long sentences (at least 27 words)
22 paragraphs, average length 6.0 sentences
1 questions
longest sent 46 wds at sent 13; shortest sent 1 wds at sent 8

sentence beginnings:

pronoun (23) interrogative pronoun (1) article (40)