



Information quality in design process documentation of quality management systems



Łukasz Grudzień*, Adam Hamrol

Poznan University of Technology, Faculty of Mechanical Engineering and Management, Department of Management and Production Engineering, Piotrowo Street 3, 60-965 Poznan, Poland

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ABSTRACT

Information is the main constituent of documents that make up a quality management system. The main function of information found in process documents is to provide knowledge regarding how to executing a process and to standardize this process by providing a specific path of execution. However, it is not easy to determine a standard level of quality of process information optimal from the viewpoint of the owner and the process executor. Since there is no universal standard that would allow evaluation of the quality of process information, the purpose of the presented studies was to solve the aforementioned problems and to provide practical solutions for document makers to design proper process descriptions. To achieve the main purpose, a methodology for examination of influence characteristics of processes on information requirements of users of process documents was created. The paper presents findings carried out in processes at enterprises and is aimed at finding relation between attributes describing information and characteristics of processes. The paper proposes a set of guidelines developed by the authors for selection of appropriate document characteristics. These guidelines are based on findings collected from the conducted research.

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1. Topic origins

Today, information is considered one of the most important resources of enterprises (English, 1996). In quality management systems, information provides knowledge regarding how to execute processes by providing a specific path of execution (Hamrol 2008; Schlickman 2003; Truś 2004).

However, it is not easy to determine a rational and standard level of quantity and the range of information that would be best from the viewpoint of the process executor (Zhao, Tang, Darlington, Austin, & Culley, 2008). This is why the commentary section of the ISO 9001 standard includes an additional note: “the extent of the quality management system documentation can differ from one organization to another due to: the size of organization and type of activities, the complexity of processes and their interactions, and the competence of personnel” (ISO 9001, 2008).

In enterprises preparing documentation of quality management systems, it is usually done in a conventional way. A typical specimen of a document (a procedure) is developed and copied for all

processes executed within the management system. This thesis is also supported by pilot studies completed by the authors in 2010 on a group of 50 people responsible for processes in organizations that implemented the quality management systems (Grudzień, 2014). Nearly 70% of those surveyed declared their dissatisfaction with documents describing processes, which prompted them to use such documents infrequently. The most commonly cited accusations related to documentation are, among other things: excessively general descriptions of processes, unclear stipulations, information not pertaining to or of no interest to the user, and impossibility of putting such documents to practice.

An improperly prepared document may be misunderstood and misleading, and create barriers in internal communication (Adams, 2003). As a result, the following questions come to mind:

- What features should a good process description have, so it does not cause information redundancy, but can still guarantee its desired usefulness?
- Should all documents describing a process in a given organization follow the same pattern (form, level of detail, etc.)?

Consequently, new questions concerning information itself arise:

* Corresponding author.

E-mail addresses: lukasz.grudzien@put.poznan.pl (Ł. Grudzień), adam.hamrol@put.poznan.pl (A. Hamrol).

- What information attributes are crucial for defining the quality of information in a document?
- What is the relation, if any, between process features and the requirements in terms of information attributes?

Up to present day, no single, generally expected definition of information has been created. For purposes of this paper, it has been assumed that information should be considered in connection with its recipient (Langefors, 1980; Stefanowicz, 2010) as well as it is of key importance that information is addressed to a designated group of recipients and to identify their requirements – information needs of its users (Oleński, 2003; Kisielnicki & Sroka, 2005; Laudon & Laudon, 2002; English, 2002). It is natural to connect a recipient with a process executed. At this point, it may be useful to create profiles or models of recipients similar to what has been proposed by Ahn, Brusilovsky, Grady, He, and Syn (2007).

So far, no universal method of measurement or evaluation of the quality of information has been developed (Madnick, Lee, Wang, & Zhu, 2009). Some attempts were made at elaborating a method of measuring the quality of information (Naumann & Rolker, 2000), but proposed methods are based on evaluation of certain attributes of information selected by the authors. These methods are neither comprehensive nor universal. The authors are not aware of a method which would allow measurement of quality of information in documentation of management systems. However, creation of such a method and implementation of mechanisms of evaluating the quality of information may lead to avoidance of redundant information of little cognitive and executive value, resulting in higher usefulness. Also, no method has been identified that would allow measurement of the quality of information included in the documentation of management systems.

2. Examination of influence of characteristics of processes on information requirements of users of process documents

2.1. Determination of the characteristics of processes and attributes of information

Documentation of a quality management system refers to processes and requirements that need to be adhered to. Substantial contents of a document depend on the nature and know-how of a process (Fig. 1). In addition, a method of documenting information may take the characteristics listed in Table 1 into consideration.

Number of activities is a number of steps taken from the beginning, until a process is completed. If we consider a process to be an ordered set of activities, then the number of activities may be taken as a number of actions differentiated in a classical algorithm describing this process. Number of variants is a number of paths, along which a process can be lead. Average lead time expresses an average length of the process.

Number of involved people means a number of employees taking part in completion of a single process. Level of automation

Table 1
Characteristics of the process that were taken into consideration aside from know-how.

No.	Characteristics of process (variable)	Variable type	Group
1	Number of activities	quantitative	organizational
2	Number of variants	quantitative	
3	Average lead time	quantitative	
4	Number of people involved	quantitative	
5	Level of automation	qualitative ordinal	
6	Number of entries	quantitative	
7	Data dynamics	qualitative ordinal	
8	Process repeatability	qualitative ordinal	
9	Education of employees	qualitative ordinal	personal
10	Seniority (experience) of employees	quantitative	
11	Competence of employees	qualitative ordinal	

Source: authors' work.

expresses a ratio of the number of activities carried out automatically without direct involvement of a person (e.g. processing by a machine) to the activities performed manually (e.g. noting a non-conformity). Criterion of automation may take the following values: “null” (below 10%), “little” <10–30%), “medium” <30–60%), “large” <60–90%) and “full” if above 90% of activities happens without indirect involvement of a human. Number of entries and data dynamics are connected with entries which feed a process and which are transformed or used while conducting the process. The first feature indicates a number of sources from which data comes. The second feature shows frequency of data change (how often the type and value of data changes, e.g. the change of data concerning parameters of produced goods). For the data dynamics, the following ranges were determined: “little” (date change less than once a month), “medium” (data change several times a month), “large” (data change several times a week) and “very large” (data change minimum once a day).

Process repeatability means multiplicity of starting in a time unit. One shift, i.e. 8 h, was assumed as a basic unit. The fixed ranges are: “a few times a day”, “once a day”, “a few times a month”, “once a month” and “a few times a year or less”.

The remaining three features do not directly concern a process itself but rather the people carrying it out. Four possible levels of education were defined: basic, vocational, medium and high. Seniority determines duration of employment in realization of the same process or a similar one. Competence includes skills, licenses and other attributes acquired through specific workshops,

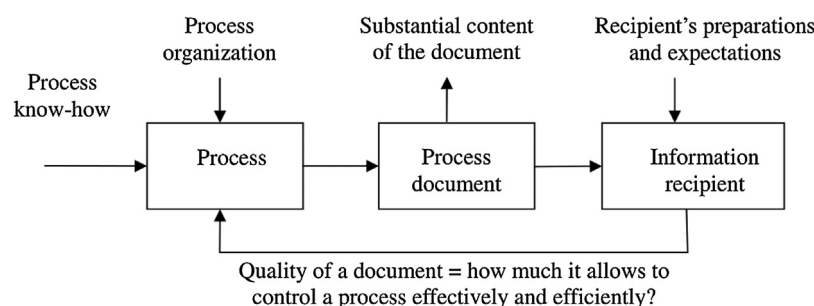


Fig. 1. A process document needs to consider know-how and organization, as well as a recipient's expectations toward the information it contains.

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