Dansk standard

DS/ISO 13053-1

1. udgave

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# Kvantitative metoder i procesforbedring – Six Sigma – Del 1: DMAIC-metodik

Quantitative methods in process improvement – Six Sigma – Part 1: DMAIC methodology

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# DS/ISO 13053-1

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# INTERNATIONAL STANDARD

# ISO 13053-1

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# Quantitative methods in process improvement — Six Sigma —

## Part 1: DMAIC methodology

*Méthodes quantitatives dans l'amélioration de processus — Six Sigma —*

*Partie 1: Méthodologie DMAIC*

Reference number
ISO 13053-1:2011(E)



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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13053-1 was prepared by Technical Committee ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 7, *Application of statistical and related techniques for the implementation of Six Sigma*.

ISO 13053 consists of the following parts, under the general title *Quantitative methods in process improvement — Six Sigma*:

— *Part 1: DMAIC methodology*

— *Part 2: Tools and techniques*

# Introduction

The purpose of Six Sigma[1)] is to bring about improved business and quality performance and to deliver improved profit by addressing serious business issues that may have existed for a long time. The driving force behind the approach is for organizations to be competitive and to eliminate errors and waste. A number of Six Sigma projects are about the reduction of losses. Some organizations require their staff to engage with Six Sigma and demand that their suppliers do as well. The approach is project based and focuses on strategic business aims.

There is little that is new within Six Sigma from the point of view of the tools and techniques utilized. The method uses statistical tools, among others, and therefore deals with uncertain events in order to provide decisions that are based on uncertainty. Consequently, it is considered to be good practice that a Six Sigma general program is synchronized with risk management plans and defect prevention activities.

A difference, from what may have gone before with quality initiatives, is every project, before it can begin, must have a sound business case. Six Sigma speaks the language of business (value measurement throughout the project), and its philosophy is to improve customer satisfaction by the elimination and prevention of defects and, as a result, to increase business profitability.

Another difference is the infrastructure. The creation of roles, and the responsibilities that go with them, gives the method an infrastructure that is robust. The demand that all projects require a proper business case, the common manner by which all projects become vetted, the clearly defined methodology (DMAIC) that all projects follow, provides further elements of the infrastructure.

The scope of this part of ISO 13053 limits the document to only cover the improvement of existing processes. It does not go into the realm of Design for Six Sigma (DFSS) or the re-engineering of a process where the DMAIC methodology is not fully suitable, nor does it cover the issue of certification. There will also be situations where any further work on an existing process is not possible, either technically, or in a financially justifiable sense. Other standards dealing with these circumstances are yet to be developed, but when they have been published, ISO 13053 together with those future documents will form a cohesive set of standards ranging from improving existing processes to the development of new ones to deliver Six Sigma levels of performance, and beyond.



1) Six Sigma is a trade mark of Motorola, Inc.

# Quantitative methods in process improvement — Six Sigma —

# Part 1: DMAIC methodology



## 1 Scope

This part of ISO 13053 describes a methodology for the business improvement methodology known as Six Sigma. The methodology typically comprises five phases: define, measure, analyse, improve and control (DMAIC).

This part of ISO 13053 recommends the preferred or best practice for each of the phases of the DMAIC methodology used during the execution of a Six Sigma project. It also recommends how Six Sigma projects should be managed and describes the roles, expertise and training of the personnel involved in such projects. It is applicable to organizations using manufacturing processes as well as service and transactional processes.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 13053-2, *Quantitative methods in process improvement — Six Sigma — Part 2: Tools and techniques*

## 3 Symbols and abbreviated terms

### 3.1 Symbols

$c$ number of defects (nonconformities)

$\mu$ location of the process; population mean value

$\mu^*$ “off-set” location of the process; “off-set” population mean value

$n_{CTQC}$ number of critical to quality characteristics

$n_{units}$ number of units surveyed

$p$ proportion of nonconforming items

$R$ sample range value

$R_{moving}$ moving range value usually calculated between successive observations

$\sigma$ population standard deviation