



International  
Standard

ISO 16355-3

**Applications of statistical and  
related methods to new technology  
and product development  
process —**

**Part 3:  
Quantitative approaches for the  
acquisition of voice of customer and  
voice of stakeholder**

*Application des méthodes statistiques et des méthodes liées aux  
nouvelles technologies et de développement de produit —*

*Partie 3: Acquisition quantitative du retour client et du retour des  
parties prenantes*

**Second edition**

**PROOF/ÉPREUVE**

iTeh Standards  
(<https://standards.itih.ai>)  
Document Preview

ISO/PRF 16355-3

<https://standards.itih.ai/catalog/standards/iso/5664a84b-bd39-49ed-af76-519af2690a90/iso-prf-16355-3>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

**PROOF/ÉPREUVE**

© ISO 2025 – All rights reserved

# Contents

Page

<b>Foreword</b>	<b>vi</b>
<b>Introduction</b>	<b>vii</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>1</b>
<b>4 Basic concepts of QFD</b>	<b>2</b>
<b>5 Integration of quantitative voice of customer (VOC) and voice of stakeholder (VOS) acquisition with customer research methods</b>	<b>2</b>
<b>6 Types of QFD projects</b>	<b>2</b>
<b>7 QFD team membership</b>	<b>2</b>
7.1 QFD uses cross-functional teams	2
7.2 Core team membership	2
7.3 Subject matter experts	2
7.4 QFD team leadership	2
<b>8 Types of information</b>	<b>2</b>
8.1 General	2
8.2 Market strategy and trends	2
8.2.1 General	2
8.2.2 Analytic network process (ANP)	3
8.2.3 Porter 5 force competitive analysis	3
8.2.4 Market position analysis	3
8.2.5 Project selection	3
8.3 Market segments	3
8.3.1 General	3
8.3.2 Demographic market segmentation	3
8.3.3 Attitudinal and cultural dimensions	3
8.3.4 New Kano model studies	3
8.3.5 Repertory grid technique	3
8.4 Competitive space	3
8.4.1 General	3
8.4.2 Benchmarking	4
8.4.3 Market position analysis	4
8.4.4 Multidimensional scaling (MDS)	4
8.4.5 Repertory grid technique	4
8.5 Customer and stakeholder applications	4
8.5.1 Frequency of use or application	4
8.5.2 Robust parameter design	4
8.6 Customer needs	4
8.6.1 Functional needs using text analytics and text mining	4
8.6.2 Emotional or attractive needs using kansei engineering	4
8.7 Prioritization	5
8.7.1 General	5
8.7.2 Analytic hierarchy process (AHP)	5
8.7.3 L-matrices	5
8.7.4 Cluster analysis	5
8.7.5 Analytic network process (ANP)	5
8.7.6 Benchmarking	5
8.8 Product requirements, feature sets, concept options	5
8.8.1 Conjoint analysis	5
8.8.2 Customer needs — Functional requirements matrix (house of quality)	5
8.8.3 Quantification method III	5
8.8.4 Regression analysis	5

8.8.5	Repertory grid technique.....	5
8.8.6	Text analytics and text mining.....	6
8.9	Distribution, logistics and inventory, sales channels.....	6
8.10	Customer satisfaction surveys and preference benchmarking.....	6
8.10.1	Customer satisfaction surveys.....	6
8.10.2	Factor analysis and covariance structure analysis.....	6
8.10.3	Fuzzy set theory.....	6
8.10.4	Net promoter score (NPS).....	6
8.10.5	Neural networks and artificial intelligence.....	6
8.10.6	Regression analysis.....	6
<b>9</b>	<b>Tools for quantitative VOC and VOS acquisition and analysis.....</b>	<b>7</b>
9.1	Analytic network process (ANP).....	7
9.1.1	General.....	7
9.1.2	Building and analysing the network.....	8
9.2	Artificial intelligence (AI).....	9
9.3	Conjoint analysis.....	10
9.3.1	General.....	10
9.3.2	Types of conjoint analyses used with QFD.....	10
9.3.3	Building the conjoint analysis survey.....	10
9.3.4	Case study of conjoint analysis and QFD.....	11
9.4	Cluster analysis.....	12
9.5	Cultural dimensions.....	12
9.5.1	General.....	12
9.5.2	Cultural dimension scores.....	13
9.5.3	Cultural dimensions and QFD.....	13
9.6	Factor analysis with covariance structure analysis.....	13
9.6.1	General.....	13
9.6.2	Factor analysis to classify functional requirements into satisfaction factors.....	13
9.6.3	Covariance structure analysis.....	14
9.7	Fuzzy set theory and multi-attribute utility theory.....	14
9.7.1	General.....	14
9.7.2	Difficulties in scoring customer satisfaction.....	14
9.7.3	Fuzzy sets.....	14
9.7.4	Crisp scores.....	15
9.7.5	Customer preferences by benchmarking competition.....	15
9.7.6	Failure mode and effects analysis using fuzzy multiple-objective decision models.....	15
9.8	Market position analysis.....	16
9.8.1	General.....	16
9.8.2	Types of market positioning.....	16
9.9	Market segmentation using cross tabulations.....	16
9.9.1	General.....	16
9.9.2	Types of cross tabulations.....	17
9.9.3	Uses of cross tabulations.....	18
9.10	Multidimensional scaling (MDS).....	18
9.10.1	General.....	18
9.10.2	Conducting the MDS study.....	18
9.10.3	Case study on toothpaste.....	19
9.11	Net promoter score (NPS).....	20
9.11.1	General.....	20
9.11.2	NPS survey.....	20
9.11.3	NPS survey results.....	20
9.12	Neural networks (NN).....	21
9.12.1	General.....	21
9.12.2	Preparing the surveys.....	21
9.12.3	Interpreting the NN output.....	22
9.12.4	Using the NN output in a QFD study.....	22
9.13	Quantification methods (QM).....	23
9.13.1	General.....	23

## ISO 16355-3:2025(en)

9.13.2	Quantification method III (QM III)	23
9.13.3	Applying QM III to a 2-dimensional QFD matrix	23
9.14	Regression analysis	27
9.14.1	General	27
9.14.2	Regression analysis in QFD	27
9.14.3	Regression data	28
9.15	Repertory grid technique	30
9.15.1	General	30
9.15.2	The repertory grid technique process	30
9.16	Text analytics and text mining	31
9.16.1	General	31
9.16.2	Text clustering	31
9.16.3	Topic modelling	32
<b>10</b>	<b>Deployment to next stage</b>	<b>33</b>
10.1	Customer needs related information	33
10.2	Product related information	33
<b>Annex A (informative) Using sampling surveys</b>		<b>34</b>
<b>Bibliography</b>		<b>42</b>

# iTeh Standards (<https://standards.iteh.ai>) Document Preview

[ISO/PRF 16355-3](https://standards.iteh.ai/catalog/standards/iso/5664a84b-bd39-49ed-af76-519af2690a90/iso-prf-16355-3)

<https://standards.iteh.ai/catalog/standards/iso/5664a84b-bd39-49ed-af76-519af2690a90/iso-prf-16355-3>

**PROOF/ÉPREUVE**

© ISO 2025 – All rights reserved

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents). ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 8, *Application of statistical and related methodology for new technology and product development*.

This second edition cancels and replaces the first edition (ISO 16355-3:2019), which has been technically revised.

The main changes are as follows:

- minor correction to cited text for cultural dimensions.

A list of all parts in the ISO 16355 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

Quality function deployment (QFD) is a method to assure customer or stakeholder satisfaction and value with new and existing products by designing in, from different levels and different perspectives, the requirements that are most important to the customer or stakeholder. These requirements can be well understood through the use of quantitative and non-quantitative tools and methods to improve confidence of the design and development phases that they are working on the right things. In addition to satisfaction with the product, QFD improves the process by which new products are developed.

Reported results of using QFD include improved customer satisfaction with products at time of launch, improved cross-functional communication, systematic and traceable design decisions, efficient use of resources, reduced rework, reduced time-to-market, lower lifecycle cost, and improved reputation of the organization among its customers or stakeholders.

This document demonstrates the dynamic nature of a customer-driven approach. Since its inception in 1966, QFD has broadened and deepened its methods and tools to respond to the changing business conditions of QFD users, their management, their customers, and their products. Those who have used older QFD models find these improvements make QFD easier and faster to use. The methods and tools shown and referenced in the standard represent decades of improvements to QFD; the list is neither exhaustive nor exclusive. Users can consider the applicable methods and tools as suggestions, not requirements.

This document is descriptive and discusses current best practice, it is not prescriptive by requiring specific tools and methods.

iTeh Standards  
(<https://standards.iteh.ai>)  
Document Preview

ISO/PRF 16355-3

<https://standards.iteh.ai/catalog/standards/iso/5664a84b-bd39-49ed-af76-519af2690a90/iso-prf-16355-3>