

ISO 16355-3:2025-10 (E)

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

Contents

Page

- Foreword..... vi
- Introduction..... vii
- 1 Scope..... 1
- 2 Normative references..... 1
- 3 Terms and definitions..... 1
- 4 Basic concepts of QFD..... 2
- 5 Integration of quantitative voice of customer (VOC) and voice of stakeholder (VOS) acquisition with customer research methods..... 2
- 6 Types of QFD projects..... 2
- 7 QFD team membership..... 2
 - 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
- 8 Types of information..... 2
 - 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
9	Tools for quantitative VOC and VOS acquisition and analysis	7
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
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
10	Deployment to next stage.....	33
10.1	Customer needs related information.....	33
10.2	Product related information.....	33
Annex A (informative) Using sampling surveys.....		34
Bibliography.....		42