

SLOVENSKI STANDARD SIST EN 17952:2024

01-julij-2024

	Upravljanje vrednosti - Analiza funkcij, osnovne značilnosti: Zahteve in navodila za izvajanje in doseganje rezultatov
	Value management - Function analysis, basic characteristics: Requirements and guidance for implementation and achieving deliverables
	Value Management - Funktionsanalyse, grundlegende Merkmale
	Management par la Valeur - Analyse Fonctionnelle, caractéristiques fondamentales : Exigences et recommandations pour la mise en œuvre et la réalisation des livrables
	Ta slovenski standard je istoveten z: EN 17952:2024
ht	tps://standards.iteh.ai/catalog/standards/sist/2061f5c2-3882-4e23-99bf-c53f82fd9dbf/sist-en-17952-20 ICS:
	03.100.40 Raziskave in razvoi Research and development

SIST EN 17952:2024

en,fr,de

SIST EN 17952:2024

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

<u>SIST EN 17952:2024</u> https://standards.iteh.ai/catalog/standards/sist/2061f5c2-3882-4e23-99bf-c53f82fd9dbf/sist-en-17952-2024

EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

EN 17952

June 2024

ICS 03.100.40

English Version

Value Management - Function Analysis: Basic characteristics, requirements and guidance for implementation

Management par la valeur - Analyse Fonctionnelle: caractéristiques fondamentales, exigences et recommandations pour la mise en œuvre Value Management - Funktionenanalyse: Grundlegende Merkmale, Anforderungen und Leitlinien für die Umsetzung

This European Standard was approved by CEN on 27 February 2024.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

<u>SIST EN 17952:2024</u>

https://standards.iteh.ai/catalog/standards/sist/2061f5c2-3882-4e23-99bf-c53f82fd9dbf/sist-en-17952-2024



EUROPEAN COMMITTEE FOR STANDARDIZATION COMITÉ EUROPÉEN DE NORMALISATION EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN 17952:2024 (E)

Contents

European foreword					
Introd	Introduction				
1	Scope	8			
2	Normative references	9			
3	Terms, definitions and abbreviated terms	9			
4	Function Analysis overview	.14			
4.1	Context for Function Analysis				
4.2	Function Analysis: a system approach	.15			
4.3	Function Analysis with its two distinct areas				
4.3.1	General				
4.3.2	Functional Need Analysis	.19			
4.3.3	Technical Function Analysis	.20			
4.4	Essential conditions for successful Function Analysis				
4.4.1	Essential Conditions for success				
4.4.2	Roles and contributions of the involved people				
4.5	Function Thinking	.22			
-	Application of Function Analysis	22			
5					
5.1	General				
5.2	Level of analysis				
5.2.1	General				
5.2.2	Top Management level of the organization: Vision and Strategy				
5.2.3	Management level				
5.2.4	Operational level				
5.2.5	Day-to-Day Management				
5.3	Integrating with other Disciplines.				
5.3.1	Risk management and Dependability				
5.3.2	Sourcing and Procurement				
5.3.3	Systems and Software Engineering				
5.3.4	Innovation Management				
5.3.5	Organization corporate social responsibility				
6	Requirements for effective application of Function Analysis				
6.1	General				
6.2	Scope study				
6.3	Identify functions and constraints				
6.4	Organize the functions				
6.5	Characterize the functions				
6.6	Prioritizing the functions	.31			
6.7	Estimating efficiency of potential solutions				
7	Requirements applicable to Function Analysis deliverables				
7.1	General				
7.2	Requirements applicable to Functional Need Analysis (FNA) deliverables				
7.2.1	General				
7.2.2	Study Scope				
7.2.3	Description of the overall need	.33			

7.2.4	Search for identification and description of functions	34			
7.2.5	Contribution to the definition and validation of the solution	37			
7.2.6	Use of Functional Need Analysis	39			
7.3	Requirements applicable to Technical Function Analysis (TFA) deliverables	39			
7.3.1	General				
7.3.2	Expected contributions	39			
7.3.3	Study Scope	40			
7.3.4	Description of the need to be satisfied	40			
7.3.5	Description of functions				
7.3.6	Contribution to the definition and validation of the solution	43			
7.3.7	Use of Function Analysis for market testing and Competitive Advantage	46			
Annex A (informative) Guidance applicable to the approach and methods of Function					
	Analysis	48			
Biblio	graphy	57			

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

<u>SIST EN 17952:2024</u> https://standards.iteh.ai/catalog/standards/sist/2061f5c2-3882-4e23-99bf-c53f82fd9dbf/sist-en-17952-2024

European foreword

This document (EN 17952:2024) has been prepared by Technical Committee CEN/TC 279 "Value management, value analysis, function analysis", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2024, and conflicting national standards shall be withdrawn at the latest by December 2024.

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

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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

<u>SIST EN 17952:2024</u> https://standards.iteh.ai/catalog/standards/sist/2061f5c2-3882-4e23-99bf-c53f82fd9dbf/sist-en-17952-2024

Introduction

This document sets out requirements for Function Analysis (FA). FA is used to define and validate needs, prioritize requirements, assess performance, stimulate innovation, guide design and support procurement and inform decisions to use, reuse, and recycle parts and products.

FA provides people in different fields of application with a proven method for defining needs, developing an offer, improving purchases, contracting a partnership or increasing the efficiency of activities. FA is a process that describes completely the functions and their relationships which are systematically characterized, classified and evaluated.

0.1 General

The purpose of this document is to provide effective support to any person or organization wishing to improve its effectiveness or performance or operational activities and in the definition, development or the realization of any action or project.

FA makes an effective contribution in fields of quality management (EN ISO 9001), environmental management systems (EN ISO 14001), configuration management (ISO 10007, EN 9223-100), dependability management (EN 60300-1), circular economy (EN 62309), systems and software engineering (ISO/IEC/IEEE 15288) and performance management. It is essential for Value Management (EN 12973) and successful application of a Functional Performance Specification (EN 16271).

FA involves and relies upon a way of thinking, based on a continuous process, with or without a dedicated team, that encourages the search for the goal and the need to be fulfilled, before looking for ways to achieve it that applies at any level and in any process.

FA firstly, defines the objective in a concise and clearly expressed way, independent of any solution, and secondly, provides support and assistance in the process to effectively achieve the defined need. FA activities support enhanced teamwork, assists in gaining a consensus agreement and collaboration in the collective pursuit of the chosen goal.

FA is a standalone method and is used by many disciplines, for example, concurrent or simultaneous engineering, systems and software engineering and risk management. This document specifies that the practice of FA meets specific requirements to ensure the validity of the expected results in the intended usage context. FA is a fundamental component in improving performance of organizations, allowing the

pursuit of opportunities while identifying and significantly reducing threats throughout the life cycle. FA is linked to Value Management, Value Analysis and Value Engineering. FA is a specific method; it should not be confused with classic methods such as the Functional Analysis in applied mathematics.

This document describes the global structure of FA, how it is situated in the organizational environment and how it links to other management and engineering practices.

In addition, it provides recommendations for the implementation of commonly used FA methods and tools (Annex A).

0.2 Function Analysis at the heart of Management

For any management activity it is imperative to differentiate systematically the two distinct areas, in one area, the goal to be achieved (the objective) and need to be met, using Functional Need Analysis (FNA) and in the other area, the way to achieve it (the means and resources, the process or the solution) using Technical Function Analysis (TFA).

FA, with its two distinct areas, provides an effective and strong methodological support at any level and in any field, when dealing with challenges of whatever complexity. It could be used for example, in strategic planning, business and project management, product and market development, or in any process of problem solving. It provides you with the opportunity to improve the performance of your organization.

0.3 Contributions for the different users of the standard

FA helps different users to clarify and define problems of any kind that concern an organization, thus contributing to their definition and resolution.

The benefits from effectively applying Functional Need Analysis include:

- the identification and description, in a concise language, without any ambiguity, the need to be satisfied for a given study subject (the aim to be reached); and
- the assurance of improved communication between everyone in the team involved in the project, within a common vision, free from unnecessary specialist jargon.

The benefits of the TFA include:

- a controlled traceability between the identified need and how this is satisfied by the proposal or solution;
- the supply of rational choices for a solution, supported by the identification and evaluation of the benefits and impacts induced and an assessment of the ability to meet the identified need; and
- a systematic method to facilitate the treatment of complexity, risk and uncertainty.

0.4 Key roles and responsibilities

A prerequisite for FA lies in the clarity of the roles, field of activity and the responsibilities of each person involved, whether formalized or not.

In the case of a FA action, the following roles are fundamental:

- the "Decision-maker", who defines the purpose, objectives, resource allocation and ultimately will be responsible for decision-making, the definition of the need and for the specified objective, which procures the resources;
- the "FA Project Leader" or facilitator, person who is responsible for selecting the FA approach, methods and tools and who has the knowledge, competence, and personality to organize, lead and coordinate a FA team in a professional and successful way, and as such has been put in charge of
- this responsibility by management; and
- the "FA team": chosen for their knowledge of the subject, the object of the action, which could be integrated within any team.

FA can be used continuously as an effective support for any reflection.

0.5 The two distinct areas of Function Analysis

FA assists in interrogating a challenge in two distinct areas, firstly by clarifying the goal to be achieved and need to be met, and secondly, by searching, researching and establishing the best solution to the identified need and goal.

FA applies to all processes and tasks, involving contributors inside and outside the organization. It requires setting aside technical solutions to understand and interpret the objectives and aims of the proposed action in order to promote creativity in the search and evaluation of the solutions.

FA enables:

- the identification of the functions of any object such as a product or an organization;
- the quantification of the performances to be achieved;

- communication between all the people in a multidisciplinary team involved in the project with a common language;
- the identification of the principles of solutions and the benefits, impacts and risks which they generate;
- the establishment of the required performances of the solution providing a basis for the establishment of a Product Function Architecture;
- the evaluation of the capacity of a product to meet the expressed need; and
- a common understanding of the challenge posed and potential solutions considered to solve it.

This is why FA, as a process, has its place upstream, alongside and downstream of any project. FA result is the input datum in processing of any problem (the issue to resolve): be it evolution, creation, innovation, dysfunction, obsolescence, etc., for which one wishes to obtain the most effective response to satisfy the expressed need, while dispensing with a priori solutions.

Functional Need Analysis (FNA area) identifies the User Related Functions (URFs) and is intended to take into account all the needs and expectations of the different users, customers and selected stakeholders that are interested in the product throughout its life cycle.

Technical Function Analysis (TFA area) identifies the Product Related Functions (PRFs) and defines a Function Structure, provides a logical description of the technical functions and their relationships in order to examine alternatives and to propose a solution.

From an economic point of view, FA has proven to be very useful, if not essential, as it improves the return on investment which can be achieved (with shorter development time, improved performance obtained, adequacy of solutions to the expressed need, etc.), even if an existing or potential solution may often suffice.

FA, when timely and appropriately applied, assists in achieving the most appropriate proposal or potential solution.

FA, with its method and tools, is referenced in Value Management (EN 12973) and Functional Need Expression and the Functional Performance Specification (EN 16271). Additionally, European Union (EU) directives such as the EU Public Procurement Directive 2014/24 and update notices, have also encouraged the market in the wider use of the Functional Performance Specification.

0.6 Conditions for success

The participants in any FA action need to be familiar with the general area of application. In order to be efficient, the FA team will be aware that the success lies in the clarity of the roles, field of activity and the responsibilities of each person involved, whether formalized or not. An organization that implements the FA approach is liable to see the creative skills of their people improve which should enhance their organization's competitiveness. FA can be integrated into in any process in an organization.

The people involved are required to follow a path which allows scope for creativity in the pursuit of the appropriate solution. It is important to measure the effectiveness of the team over time with respect to the project or action type. Some people may need to be familiar with the area of activity for which an action is required. The range of applications that can be assessed are infinite, with a particular choice of action based on priority and the availability of skilled staff that are familiar with the FA approach.

0.7 Function Thinking

There is "Function Thinking" capability when people are able to first, in a reflective way, think of the purpose of any action, before, second, seeking a solution, while doing this in a formal or informal way.

EN 17952:2024 (E)

1 Scope

This document presents Function Analysis (FA) and specifies requirements for Function Analysis and its deliverables. It presents the two distinct areas of application, namely, Functional Need Analysis (FNA) relating to understanding the need, setting goals and Technical Function Analysis (TFA) relating to selecting and developing a solution. It specifies requirements for the basic characteristics of the deliverables within FNA and TFA and expands requirements, guidance and recommendations about FA expressed in the Functional Performance Specification Standard (EN 16271) and in the Value Management Standard (EN 12973).

This document provides an essential reference and support for any person wishing to improve the efficiency, effectiveness and overall performance of their organization. It aims to support sustainable development in an organization. FA offers an opportunity to enhance skills of people involved.

In order to present the conditions for implementation and development of FA deliverables, this document:

- introduces the interests and fields of application and presents a variety of situations in which FA is used in support of projects of all types and sizes;
- specifies essential conditions for successful FA, including roles and responsibilities of the people involved, monitoring the performance of the FA team, processes for validation and verification and supply of valid and verified deliverables; and
- specifies requirements for FA and the basic characteristics of FA deliverables whilst outlining methods, and tools for the realization of the deliverables.

FA is progressed using the following:

- FNA: support for the process of identifying and understanding the need, defining objectives, and setting the goal to be achieved;
- TFA: support for design or research processes and evaluation of solutions; and
- Iteratively focusing on the FNA and TFA by revisiting the identified need, balancing capabilities of available technologies, resources and constraints, achieving the most desirable outcome.

In the area of FNA, this document sets out FNA requirements for the deliverables to establish the Functional Need Expression (FNE). The FNE can serve as a basis for establishing an understanding of the expressed need, the complete list of User Related Functions (URFs), constraints and interfaces. These deliverables serve as a basis for identifying, organizing, characterizing and prioritizing functions and function interfaces. These deliverables can also support preliminary risk and reliability studies, economic studies, impact assessments and development of Functional Performance Specifications (FPSs).

In the area of TFA, this document sets out requirements for TFA deliverables which aim to satisfy the need, expressed in the FNE. The TFA deliverables are focused on analysing existing and potential solutions, identifying a complete list of the Product Related Functions (PRFs) to meet the FNE; evaluating concepts and making a choice for a solution then optimizing the Product Function Architecture (PFA) to identify the "best" solution.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 16271, Value management - Functional expression of the need and functional performance specification - Requirements for expressing and validating the need to be satisfied within the process of purchasing or obtaining a product

EN 12973, Value Management

EN 1325, Value Management - Vocabulary - Terms and definitions

3 Terms, definitions and abbreviated terms

For the purposes of this document, terms and definitions given in EN 1325 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at https://www.iso.org/obp
- IEC Electropedia: available at <u>https://www.electropedia.org/</u>

3.1 Terms and definitions

3.1.1

customer

person or organization who has the potential to be a user of a product at any time during its life cycle

[SOURCE: EN 1325:2014, 2.1.3]

Document Preview

3.1.2

user

person or organization for which the product is designed and which exploits at least one of its functions at any time during its life cycle

Note 1 to entry: A user can be an external or internal customer.

[SOURCE: EN 1325:2014, 2.1.4]

3.1.3

stakeholder

person or organization which has an interest in and influence on a product at any time during its life cycle

[SOURCE: EN 1325:2014, 2.1.2]

3.1.4

decision-maker

entity or member of an organization who gives scope to the Function Analysis project and is the ultimate decision-maker of the chosen proposals of the Function Analysis (FA) team which will be implemented

3.1.5

function analysis team

multidisciplinary group of people, selected for their competence, expertise and responsibility in various aspects of the Function Analysis subject being studied

3.1.6

function analysis project leader

person who has the knowledge, competence, and personality to organize, lead and coordinate a Function Analysis (FA) team in a professional and successful way, and as such has been put in charge of this responsibility by management

3.1.7

enquirer

person or organization in search of a product and which is responsible for issuing the Functional Performance Specification, with a view to its purchase or acquisition and use by itself or by others

[SOURCE: EN 1325:2014, 2.2.4.2]

3.1.8

product

result of activities or processes, any goods, supplies, process, service, system, strategy or organization

Note 1 to entry: A product can include service, hardware, processed materials, software or a combination thereof.

Note 2 to entry: A product can be tangible (e.g. assemblies or processed materials) or intangible (e.g. knowledge or concepts), or a combination thereof, or a temporary endeavour (e.g. project created to produce agreed deliverables).

Note 3 to entry: A product can be either intended (e.g. offering to customers) or unintended (e.g. pollutant or unwanted effects).

Document Preview

Note 4 to entry: A product can be a project.

[SOURCE: EN 1325:2014, 2.1.5, Note 2 modified, Note 4 added.]

https://standards.iteh.ai/catalog/standards/sist/2061f5c2-3882-4e23-99bf-c53f82fd9dbf/sist-en-17952-2024 3.1.9

need

what is necessary for or desired by the, Users, Customers and other Stakeholders

Note 1 to entry: A need can be declared or undeclared; it can be existing or potential.

[SOURCE: EN 1325:2014, 2.1.8, modified.]

3.1.10

function

effect of a product or of one of its constituents

Note 1 to entry: Functions should be expressed in an abstract form, free of solutions.

Note 2 to entry: In some contexts, the function of a product may be recognized as mode of action or activity by which a product fulfils its purpose.

[SOURCE: EN 1325:2014, 2.3.1.1, modified, Note 2 added.]

3.1.11 user related function URF

effect expected of a product, or to be performed by it, in order to meet a part of the need of a user

Note 1 to entry: Users and the market are only interested in User Related Functions.

Note 2 to entry: Customer needs and specifications may be expressed as a set of User Related Functions.

Note 3 to entry: The term "External Function" used in certain professional circles can be considered synonymous.

Note 4 to entry: User Related Functions might be either necessary or unnecessary, desirable or undesirable. Functional Need Analysis (FNA) is a method which helps to eliminate unnecessary and undesirable functions.

[SOURCE: EN 1325:2014, 2.3.1.4.1, Modified, Original Note 3 deleted and new Note 3 added and new Note 4 added.]

3.1.12 product related function PRF

effect of a constituent of a product or the effect between the constituents of the product for the purpose of performing User Related Functions

Note 1 to entry: When choosing an overall solution, the designer or organizer determines the Product Related Functions sometimes called internal functions.

Note 2 to entry: The Product Related Functions of a complete product can constitute the User Related Functions of a component element of the product.

Note 3 to entry: The Product Related Functions can be related to the available technology.

Note 4 to entry: A Product Related Function might be either necessary or unnecessary, desirable or undesirable.

Note 5 to entry: This document, in accordance with established practice, uses the term "Product Related Function"; the term "Internal Function and Technical Function" used in certain professional circles can be considered synonymous.

[SOURCE: EN 1325:2014, 2.3.1.4.2, modified, Note 5 added.]

3.1.13 function analysis FA

process that describes completely the functions and their relationships, which are systematically characterized, classified and evaluated

Note 1 to entry: The Function Structure is a part of the result of Function Analysis.

Note 2 to entry: Function Analysis covers two distinct areas: The Functional Need Analysis (or External Function Analysis) and the Technical Function Analysis (or Internal Function Analysis).

[SOURCE: EN 1325:2014, 2.3.1, modified, Note 2 revised and Note 3 deleted.]

3.1.14 functional need analysis FNA

part of Function Analysis which describes the need that the product shall satisfy in the form of User Related Functions and constraints

Note 1 to entry: Sometimes referred to as 'External Function Analysis' or 'Customer Function Analysis'.

[SOURCE: EN 1325:2014, 2.3.1.2, Note 1 modified.]

3.1.15 functional need expression FNE

result of a Functional Need Analysis

Note 1 to entry: The Functional Need Expression is used as a basis to draw up the main part of the Functional Performance Specification.

Note 2 to entry: Obtaining a product may comprise acquisition, exploratory studies, or development followed by supply.

[SOURCE EN 1325:2014, 2.3.3.1]

3.1.16

technical function analysis

TFA

part of Function Analysis which contributes to studying and formalizing the Product Function Architecture by identifying the Product Related Functions

Note 1 to entry: The term "Internal Function Analysis" used in certain professional circles can be considered synonymous.

Note 2 to entry: The term "Performance Function Analysis" used in certain professional circles can be considered synonymous. <u>SIST EN 17952:2024</u>

https://standards.itel.ai/catalog/standards/sist/2061f5c2-3882-4e23-99bf-c53f82fd9dbf/sist-en-17952-2024 Note 3 to entry: A Technical Function Analysis helps to explain how a product works and what it does to satisfy the need.

[SOURCE: EN 1325:2014, 2.3.1.3, modified, specific reference to sub-assemblies and components removed as these are part of the product, Note 1 revised and Notes 2 and 3 added.]

3.1.17

function structure

arrangement of functions resulting from Function Analysis, which can be presented in the forms of a tree, or of a diagram, for example, giving a complete, visual, written presentation

Note 1 to entry: When Product Related Functions are considered, the Function Structure shows the way in which the functions interact.

[SOURCE: EN 1325:2014, 2.3.1.5]

3.1.18

product function architecture

deliverable result of the Technical Function Analysis (TFA) activity established by the designer, listing all the constituents of a solution