

SLOVENSKI STANDARD SIST-TP CEN ISO/TR 41016:2024

01-julij-2024

Upravljanje objektov in storitev - Pregled razpoložljivih tehnologij (ISO/TR 41016:2024)

Facility management - Overview of available technologies (ISO/TR 41016:2024)

Technologie im Facility Management - Anwendungsbereich, Schlüsselkonzepte und Vorteile (ISO/TR 41016:2024)

Facility management - Vue d'ensemble des technologies disponibles (ISO/TR 41016:2024)

Ta slovenski standard je istoveten z: CEN ISO/TR 41016:2024

ICS:

03.080.10 Vzdrževalne storitve.

Upravljanje objektov

Maintenance services. Facilities management

SIST-TP CEN ISO/TR 41016:2024

en,fr,de

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

SIST-TP CEN ISO/TR 41016:2024

TECHNICAL REPORT

CEN ISO/TR 41016

RAPPORT TECHNIQUE

TECHNISCHER REPORT

April 2024

ICS 03.080.10

English Version

Facility management - Overview of available technologies (ISO/TR 41016:2024)

Facility management - Vue d'ensemble des technologies disponibles (ISO/TR 41016:2024)

Technologie im Facility Management -Anwendungsbereich, Schlüsselkonzepte und Vorteile (ISO/TR 41016:2024)

This Technical Report was approved by CEN on 13 January 2024. It has been drawn up by the Technical Committee CEN/TC 348.

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.

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

SIST-TP CEN ISO/TR 41016:2024

https://standards.iten.ai/catalog/standards/sist/d93c1485-162d-41cc-89a3-66/3469eaf9a/sist-tp-cen-iso-tr-41016-2024



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

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

CEN ISO/TR 41016:2024 (E)

Contents	Page
European foreword	

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

SIST-TP CEN ISO/TR 41016:2024

CEN ISO/TR 41016:2024 (E)

European foreword

This document (CEN ISO/TR 41016:2024) has been prepared by Technical Committee ISO/TC 267 "Facility management" in collaboration with Technical Committee CEN/TC 348 "Facility Management" the secretariat of which is held by SN.

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/national committee. A complete listing of these bodies can be found on the CEN website.

Endorsement notice

The text of ISO/TR 41016:2024 has been approved by CEN as CEN ISO/TR 41016:2024 without any modification.

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

SIST-TP CEN ISO/TR 41016:2024

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

SIST-TP CEN ISO/TR 41016:2024



Technical Report

ISO/TR 41016

Facility management — Overview of available technologies

Facility management — Vue d'ensemble des technologies disponibles

First edition 2024-04

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

SIST-TP CEN ISO/TR 4101 6:2024

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

SIST-TP CEN ISO/TR 41016:2024

https://standards.iteh.ai/catalog/standards/sist/d93c1485-f62d-4fcc-89a3-6673469eaf9a/sist-tp-cen-iso-tr-41016-2026



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024

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 Website: www.iso.org

Published in Switzerland

Contents				Page
Forev	word			v
Intro	ductio	n		vi
1	Scope	<u>.</u>		1
2	Norm	native r	eferences	1
3			efinitions	
4	Scope 4.1		lity management technologyy management technology	
	4.2	Imnac	t of application on facility management business goals	
	4.3		1 thread initiative	
	4.4	Asset	and facility management applications	2
	4.5		acing	
	4.6		ization systems	
	4.7		y management technology drivers	
5	Kev c	oncent	s: Domains in facility management technology	4
5	5.1	Ontolo	ogies	4
	5.2		ptual landscape	
	5.3		ation domain pillars	
	5.4		ting environment	
	5.5	Horizo	ontal versus hierarchical structures	6
	5.6	Grids	and networks (FMTech periodic table reference: column 1)	
		5.6.1	General	
		5.6.2	Networks (FMTech periodic table reference: MbN, 1.1; LAN, 1.2; WAN, 1.3)	
		5.6.3	Utilities (FMTech periodic table reference: UTL, 1.4)	9
	5.7		actions, security and storage (FMTech periodic table reference: column 2)	10
		5.7.1	General	10
		5.7.2	Biometrics (FMTech periodic table reference: Biom, 2.1)	10
		5.7.3	Cyber security (FMTech periodic table reference: CS, 2.2)	10
		5.7.4	Blockchain (FMTech periodic table reference: BC, 2.3)	
		5.7.5 5.7.6	Backup (FMTech periodic table reference: BU, 2.5)	
	5.8		Smart contracts (FMTech periodic table reference: SmC, 2.6)ation, monitoring and delivery (FMTech periodic table reference: column 3)	
	3.0 andards	F Q 1	Robotics (FMTech periodic table reference: RBT, 3.1)	-41 12 6-2024
		5.8.2	Wearables (FMTech periodic table reference: Wbl, 3.3)	
		5.8.3	Smart assets and digital experience monitoring (FMTech periodic table	12
		5.0.5	reference: SmA, 3.4; DEM, 3.5)	12
	5.9	Digita	l workplace (FMTech periodic table reference: column 4)	13
		5.9.1	General	13
		5.9.2	Virtual reality and assistants (FMTech periodic table reference: AR, 4.1; VR,	
			4.2; VA, 4.3; 3DA 4.4)	13
		5.9.3	Smart workspaces	13
		5.9.4	Operational applications (FMTech periodic table reference: OA, 4.5)	14
	5.10		uter and data insights (FMTech periodic table reference: column 5)5	
		5.10.1	General	14
		5.10.2	Computer vision and learning types (FMTech periodic table reference: CV, 5.1;	
		= 400	ML, 5.2; CC, 5.3; DL, 5.5)	14
			Natural language processing (FMTech periodic table reference: NLP, 5.4)	15
		5.10.4	Deep learning and neural networks (FMTech periodic table reference: DL, 5.5;	45
	F 11	I C.	NN, 5.6)	
	5.11		nation models and frameworks	
			General Building information modelling and location referencing (FMTech periodic	10
		J.11.Z	table reference: BIM, 6.1; GIS, 6.2)	16
		5.11 3	Whole life management (FMTech periodic table reference: WL, 6.5)	17
		J U		

		5.11.4 Health and safety, and well-being (FMTech periodic table reference: H Well, 6.7)		
	5.12			
6	Busir	ness case benefits from technological applications in facility management		
	6.1	Facility management technological strategy		
	6.2	Response to organizational needs		
	6.3	Formation of a guiding coalition		
	6.4	Choice of technology	21	
	6.5	Creation of the business case and proof of return on investment		
	6.6	Agile project management		
		6.6.1 General		
		6.6.2 Examples of agile methodologies		
	6.7	Programmatic risk of being an early adopter		
		6.7.1 General	23	
		6.7.2 Risk management		
		6.7.3 Progress pace and judgement errors		
		6.7.4 Risk mitigation		
	6.8	FM technology maturity		
		6.8.1 Gap analysis		
		6.8.2 Assessment of business needs		
		6.8.3 Demand functionality		
		6.8.4 Maturity levels	27	
		6.8.5 Additional considerations		
	6.9	Harnessing of opportunities available through technology		
		6.9.1 Point of intersection with facility management practice	28	
		6.9.2 Intersection by stakeholders — Supporting change	29	
		6.9.3 Intersection by function	32	
Annex	A Ex	xample of an ecosystem landscape	35	
Bibliog	36 Bibliography			

Document Preview

SIST-TP CEN ISO/TR 41016:2024

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 document 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).

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. 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.

This document was prepared by Technical Committee ISO/TC 267, Facility management, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 348, Facility management, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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.

SIST-TP CEN ISO/TR 41016:2024

Introduction

This document provides facility managers, their teams and stakeholders an overview of available facility management (FM) technologies. Only by understanding technology's diverse, evolving potential can the facility manager community make best use of its scope, efficiencies and benefits to support its everyday operations.

The long-term benefits of FM technology are not only commercial or budgetary, relating to hard or soft services, safety or environmental objectives, or achieving process change; they will contribute to achieving the United Nation's Sustainable Development Goals (SDGs). As a component of the ISO 41000 family of standards, integrated technology also offers significant potential value by providing input to their core business strategy roadmap. It will allow facility managers to fully understand and deploy the power of technology as a business productivity enabler, to improve on their capabilities and system capacities. Those that take advantage and embrace technology will be better able to shape the vision of an enhanced, digitalised FM experience.

Globally, the FM industry continues to adapt by advancing thought leadership and creating innovative, operational digital frameworks. Applied effectively, frameworks that are designed to foster international best practices will enhance the productivity of the FM workforce and enable each FM sector keep pace with digital advancements and transformation campaigns.

Further education on achievable goals is needed, as well as a shared common vocabulary and a collective understanding. Digital FM (DFM) is the interface between FM and technology. It presents an ideal opportunity for transformation, enhancing workforce skillsets, improving asset owners' awareness and service delivery performance capabilities, by further automating the built environment and connecting all stakeholders.

FM has become a globally recognized discipline, in which challenges are faced, be they technology-related, involving safety or environmental protection, or even from pandemics or budget constraints. It is important to note that facility management is a people-centric sector. As devices become more tech-capable, these resources need to be able to work in buildings that are categorized as SMART (specific, measurable, achievable, realistic and time-related). From the PC to the internet, smartphones to energy management, the public has high expectations from technology and its everyday use. Well-managed facilities and carefully applied technology enable facility occupants to work effectively and safely, in a constantly changing digital environment. Facility managers need to be an integral part of this digital transformation.

Adoption of the Internet of Things (IoT), together with Building Information Modelling (BIM), the use of 5G telecoms, new software products and applications for 3D to 7D management of the life cycle of buildings (including their design, construction, operations and maintenance), is not a single change management programme. This document gives insight into the means by which technology can be more understood and better incorporated, a key part of a business strategy.