Call for experts
CEN/TC 348 WG 10 "FM digital transformation"

CEN/TC 348 approved the creation of a new working group WG 10 "FM digital transformation" on 2022-10-10 for the development of a new standard

Title of the standard: Approach towards FM digital transformation
Scope of the standard (extract from **N 795**, see enclosed):
➢ The standard will specify a methodology on how an FM related organization or department can identify and define requirements towards selecting the most appropriate digital technologies to manage their FM operations in the most cost effective and efficient way. The standard will give recommendations on the digital transformation road map as the output on this process (methodology)

First WG 10 meeting 17 March
The first meeting of the working group is planned for 17. March 2023 12:00 CEN time / 11:00 GMT and will be a web – hybrid meeting. Draft agenda for this meeting is:
1) Introduction by each member with emphasis on related experience on the subject
2) Presentation of the suggestion
3) Define objectives
4) Discuss approach and feedback required
5) Set a plan and next steps

We are seeking these roles and competencies
We are now seeking a diversity of experts to this working group to start developing a new standard. Relevant stakeholders, roles and competencies may cover but not limited to:
➢ Asset and facilities owners and users
➢ FM organizations from private and public sector
➢ Facility managers and engineers (Electrical, Mechanical, Civil)

- ➢ Facility Project Managers
- ➢ Facility service providers
- ➢ Computer Aided Facility Management Application Consultants
- ➢ Experts in integrated workplace management systems
- ➢ Experts in FM processes and procedures
- ➢ Experts in Assets and FM data structure / Taxonomy and analytics
- ➢ Property and Real Estate FM experts
- ➢ Suppliers of Asset and Maintenance Management software solutions
- ➢ Smart Buildings Solutions Specialists
- ➢ Sustainability experts
- ➢ Space Management Experts
- ➢ Persons working with security (technology, service providers)
- ➢ Researchers and academia

Contact information WG 10:
The convenor of the working group is
- ➢ Mr. Andreas Hadjioannou from Cyprus, andreash@virtual-it.com.cy

The secretary of the working group is
- ➢ Mr. Christos Papageorgiou, c.papageorgiou@cys.org.cy

Appoint your expert(s) by 10 March
We hope for your help to recruit experts to this interesting new working group.
You are kindly invited to appoint experts to CEN/TC 348 WG 10 by **2023-03-10** by adding them to CEN Global Directory database. An internal committee ballot has been made to collect information from you as well.

Best regards
Merete H. Murvold
CEN/TC 348 Secretary

Enclosure:
N 795 New Work Item Proposal approved 2022-10-10 (as basis for the work)
Paper developed by Andreas Hadjioannou November 2021 (as background document)

	Decision CEN/TC 348 154/2022 taken on 2022-10-10
	Subject: Adoption of a Preliminary Work Item
	CEN/TC 348 - Facility Management
Secretariat:	Proposal documented in N 795

1. Deliverable

EN

2. This item corresponds to

A new project

3. Explain the purpose and give a justification for this proposal (max 4000 characters)

The purpose of this proposal is to assist FM related stakeholders, their organizations and departments related to Facility and Asset Management with a methodology of how to digitally transform their operations and FM business processes taking advantage of the latest available digital FM technologies.

Digital technologies will allow FM organizations and departments to manage the information, processes, workflows and complexity of maintaining facilities and assets, efficiently effectively. Technologies could be in line with the technologies outlined in the ISO TR 41016.

The proposed work is to provide a recommended methodology that will guide organization through a step by step process on how to formulate a road map and action plan towards FM and AM Digital transformation. As there is an indirect relationship between complying to FM standards, requirements and the utilization of specific type of digital technologies, the proposed methodology will converge these relationships by first evaluating an organizations processes and data against FM standards such as ISO41001, relating them to their requirements. Needs and gaps are consolidated and mapped against the latest digital technologies available producing a road map, taking into consideration time, budget and ability of the organization to change.

4. Stakeholder categories immediately affected by the proposal

Industry and commerce
Standards application
SMEs
Government
Academic and research bodies
Environmental stakeholders

5. How will these Stakeholders benefit from or be impacted by the proposed deliverable?

There are a number of benefits of how FM stakeholders and their organizations / departments can improve productivity, quality and at the same time reduce costs by digitally transforming their Facility Asset and Workplace Management processes and information based on FM standards. These include:

• Ease the process of becoming compliant / certified to an FM standard
• Use FM standards to formulate a digital transformation strategy
• Bridge standards to digital technology
• Ease the comply and audit of FM standards by using digital technologies
• Improve the procurement process of digital technologies
• Improve operations effectiveness and efficiency by combining standards with the most appropriate technology
• Have a better ROI understanding and evaluation of your Digital Technologies investment

6. Document developed in drafting body

New drafting body
Name and Title: CEN/TC 348 WG 10 FM digital transformation
Name of the appointed convenor (if any): Andreas Hadjioannou (For approval through draft Decision N 155)

7. Title

Approach towards FM digital transformation

8. Scope of the proposed work item (max 4000 characters)

This document specifies a methodology on how an FM related organization or department can identify and define requirements towards selecting the most appropriate digital technologies to manage their FM operations in the most cost effective and efficient way. This document gives recommendations on the digital transformation road map as the output on this process (methodology).

The methodology will use the ISO41001 clauses to define the organization's current business compliance, which a prerequisite towards digital transformation, mapping them against the available digital technologies

It is suggested that the methodology includes the following phases:

I. Organizing the FM stakeholders, their departments and Organizations in a project team including the resources required to identify, define requirements towards an FM digital transformation road map

II. Identify, analyse and define the organization needs, objectives, size, complexity, practices, policies, strategies, IT systems and plans they have in place. (ISO41001 – 4 -Context and Organization)

III. Evaluate the FM operations processes and procedures against the ISO41001 standards clauses (Clauses 5-10) related guides and FM best practices.

IV. Derive a gap analysis of actions to be taken towards processes and information that need to be incorporated into meeting the standards guidelines / clauses and industry best

practices. Define an action plan to implement the gaps identified

V.　　Use the gap analysis and previous steps formulating the organization requirements in detail. Group and associate the business requirements into functional requirements, formulating the requirements specifications. Requirements can be organized in Property, Space, Asset Management, Maintenance and energy management functionality sections. Specific questionnaires will need to be developed to assist in this process

VI.　　Research and awareness on the latest available digital technologies

VII.　　Map the required specifications to the available digital technologies, defining sizing, data structure requirements, taxonomy, roles and responsibilities, required reports and KPIs formulating the technical specifications

VIII.　　Define a road map from the current situation to the desired level of digital transformation outlining how operations processes and in general the organization / department will be transformed based to the Business and Technical specifications documents derived from the previous steps of the methodology. The Road map should be grouped into phases based on the dependency of the identified digital technologies, budget, ROI of each technology and ability of the organization to change to the proposed digital technologies

Note: Need to develop a diagram to define the above phases

9. Proposed Project Leader (including contact details) - optional

Andreas Hadjioannou, andreash@virtual-it.com.cy
- For approval through draft Decision N 155

Secretariat from CYS (Cyprus)
- CYS has confirmed their willingness for secretary support

10. Digital aspects

None of the above

11. UN Sustainable Development Goals (SDGs)

GOAL 9: Industry, Innovation and Infrastructure
GOAL 3: Good Health and Well-being
GOAL 11: Sustainable Cities and Communities
GOAL 4: Quality Education
GOAL 7: Affordable and Clean Energy
(Rationale will be given at the next milestone for the project)

12. Accessibility aspects

Accessibility aspects are not relevant for this NWI.
The proposed new work item is a methodology process towards digital transformation of FM operations and is not relevant to accessibility access. This however maybe defined as a requirement within the outcome of the methodology depending on the specific requirements of the organization

13. Environmental aspects

Other

The Digital Transformation road map should take into consideration how the latest digital technologies can be integrated providing a vital role towards ESG by collecting raw data, organizing them into information and converting them to knowledge

14. How do you plan to address these environmental aspects?

OtherUse experts from associates Standards bodies members of the CEN-TC 348 and ISO-TC 267

15. Link with European Research and/or Innovation project

No

16. Track

Enquiry + Formal Vote (ENQ+FV)

17. Please provide the target date for the below key stage

Activation of the preliminary WI (10.99): 2024-10-10

18. Related standardization request(s) (formerly mandate)

No

19. Related directive(s)/regulation(s)

No

20. Relation to other legislation or established public policy.

No

21. Is the proposed project covered by Intellectual Property Rights (IPR)?

No

22. The decision was taken by

Simple majority

APPROACH TOWARDS FM DIGITAL TRANFORMATION

USING ISO41001

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November 2021

Abstract

This paper covers the recommended approach of how a Facility Management Services company or related department of Real Estate / Properties organization can approach and successfully digitally transform their Facility Management (FM) and Asset Management (AM) Operations, Processes and information.

It outlines the suggested step by step methodology, starting from evaluating the organization processes and information against international standards all the way towards developing and implementing an FM digital transformation road map. Through the journey the paper explains the various related digital technologies that need to be taken into consideration and the benefits expected from Digital Transforming an organizations FM operations.

Key Words

Facility Management, Asset Management, ISO41001, ISO55001, Digital Transformation, Artificial intelligence, BI, GIS, IoT, BIM, CMMS, CAFM

Audience

The paper will be useful to persons involved in Engineering, Finance, HRM, Procurement, Material Management, Contract Management, Strategy and IT related functions responsible for managing Facilities and Assets through processes and information.

Introduction

Digital Transformation is about transforming your business processes to be aligned or take advantage of the digital technologies of today providing your organization with a more effective and efficient management system. Business processes are considered the foundations for any digital transformation project. If you do not have any processes or if your processes are poor, then the end result will be poor. It is highly recommended that before you jump on digital transforming everything you find in front you, ensure first that you have an effective and efficient operating system of processes and data structure for your information in place.

In the area of Facility and Asset Management we have a number of standards that can help us evaluate our current processes, procedures and information maintained. Most important are the ISO41001 Facility Management and ISO51001 Asset Management.

According to the ISO41001 standard, Facility Management integrates multiple disciplines in order to have an influence in the efficiency and productivity of economic societies, communities and organizations, as well as the manner in which individuals interact with the build environment, FM affects the health, well-being and quality of life of much of the world's societies and population through the services it manages and delivers.

Subset and directly related is the ISO51001 Asset Management standard. Asset Management, according to the ISO55001 standard, is the combination of processes and data required to manage, monitor and maintain an organization's Assets lifecycle from procurement to disposal, in the most cost-effective manner.

Both of the standards provide guidelines for organizing your FM and AM operations towards effective and efficient asset management. You must however ensure that the recommendations from these standards are backup up by best practices in the field.

Approach

Our team has developed a methodology that will guide you through step by step on how to formulate a road map and action plan towards FM and AM Digital transformation. See the diagram below:
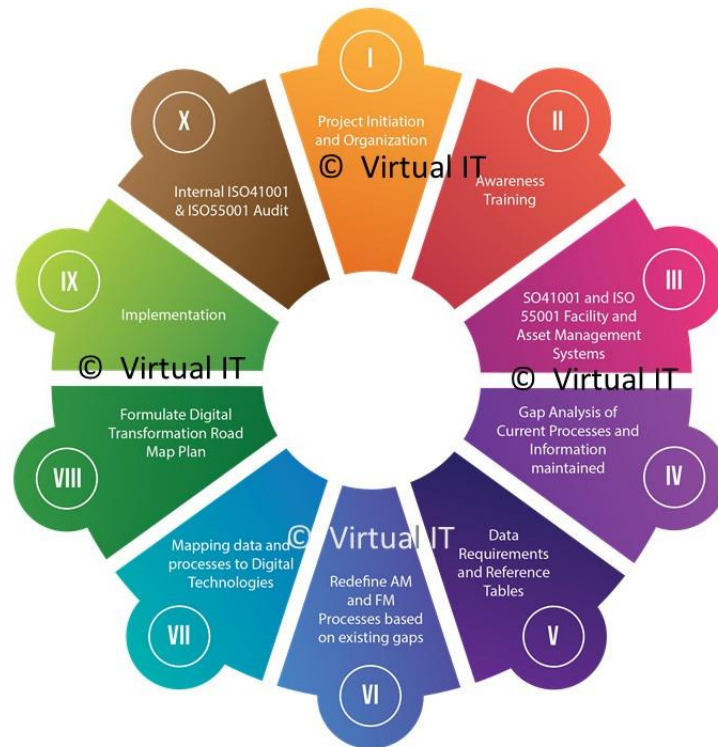
The first steps involve organisation, training and the evaluation of your current processes against the related international standards and best practices producing a gap analysis.   Both the FM and AM standards will provide you with guidelines for setting policies, objectives and strategies. They help in formulating a structured portfolio of your facilities and assets and assigning roles and responsibilities for each member of your organization related to these. The standards guide you towards maintaining contractual agreement processes, support infrastructure, risk management which includes plans, processes and procedures.

For example, when evaluating Asset Management processes and data structure you need to consider the full cycle of Asset Management from purchase to disposal. In the area of Facility Management, you need to consider processes such as incident logging, corrective and preventive maintenance, contract management and material management.

The result of this phase will be the Gap Analysis defining what processes, procedures and data structure must be accommodated in order to effectively and efficiently manage your FM and AM operations. All of these, according to the standard, must be implemented and followed with integrity, regular audit with monitoring and control mechanisms ensuring performance management and continuous improvement. Note that any standard, however sophisticated, is a collection of clauses that should be used as guidelines. When evaluating current processes and procedures you need to consider, in addition industry specific best practices.

When defining the data structure / taxonomy required you need to take into consideration the availability, cost of retrieving and maintaining quality data. You need to consider whether the information to incorporate is available, it is in good quality, the cost to retrieve it will have a high benefit and that the data collected can be effectively be maintained. You need to take into consideration what are the minimum information required to monitor and control your FM and AM Performance. Once you have these in place you need to identify the reports and KPIs you require that will help you monitor the performance of your assets, allowing you to apply improvements based on suggestions.

The next step in your digital transformation project in to apply the gaps identified to your current processes and information maintained, formulating your FM and AM SOP quality manual for your organization. Before you apply the gaps identified you need to ensure that your current IT systems will support your revised SOP quality manual. This will require you to perform an audit of your current Information Technolgoy systems required to enhance your processes and information management based on the gaps identified. This step should cover all the processes in your revised FM and AM SOP and identify gaps in your IT systems. You then need to consolidate the technologies in a map showing which technology satisfies which process and data requirements. During this process you will need to eliminate any duplicate technologies and start connecting the technologies to form the ideal system environment, formulating your road map.

Technology Considerations

There are a number of digital technologies out there that will digital transform your FM and AM operations. We can group these digital technologies available today in six categories (a) process and data management systems (b) Mobility (c) Interfacing (d) Graphical Computer Aided (e) Business intelligence (f) Artificial intelligence digital systems.

Process and data management systems includes software applications that allow you to manage your FM and AM transactions and data information. These are applications that include functions to manage your procurement, acquisition, configuration management, maintenance history, performance evaluation and disposal processes. It addition they manage your maintenance operations processes including help desk, work order management, corrective maintenance, planning of preventive maintenance, contract management, material management and cost management. Such systems are usually referred as Computerized Maintenance Management Systems (CMMS) or Computer Aided Facilities Management (CAFM) Systems and are considered core / mandatory towards your road to Digital Transformation.

Coupled with a CAFM / CMMS systems are digital technologies that allow you to take advantage of mobile devices such as mobile phones and tablets. Such technologies take the form of mobile applications that allow you to connect your operations on site where technicians and supervisors will be able to tag assets, manage any asset maintenance work, work order management, material utilizing and review maintenance history and evaluate performance on-line, on-site.

Interfacing digital technologies are technologies allow you to interact with intelligence assets and in real time receive information about the asset status, alerts, meter readings as well as manage the equipment remotely. These include Building Management Systems (BMS) and Internet of things (IoT) sensors which connect to a device and exchange information with related control platforms. Such systems also integrate with CMMS / CAFM systems receiving alerts and meter reading information automatically spawning specific corrective or preventive maintenance action.

Next category is the Graphical / Computer Aided digital technologies. These digital technologies are further subdivided into 2D, 3D and GIS technologies. 2D digital technologies are technologies which allow you to map your asset and maintenance data onto a 2 dimensional model such AutoCAD. With these technologies you will be able to manage your space, see where your assets are physically located and associated with different forms of maintenance work effecting the operation of your assets. 3D type of technologies are technologies such Building Information Modelling (BIM) which allow you to map your assets and maintenance work into a 3D model. The big difference with the 2D model is that the 3D technologies will extend the visualization of your information to assets or systems which are not visible such within walls or false ceilings and work through the whole building to trace a problem. GIS type of systems are digital technologies which map your FM and AM information to a Geo map view such as Google maps or ESRI maps. GIS technologies allow you to visualize your data through a map view instead from an application window.

Business Intelligence (BI) digital systems are applications which allow you to transform information into meaningful knowledge. Technologies like CMMS / CAFM, BMS and IoT sensors produce vast amount of data which not all of these data are useful and it is difficult for the human brain to process and produce meaningful information. BI take the raw data produced from these systems, organizes them into information silos and converts them to knowledge using best industry practices computer algorithms. BI tools have advance dashboard tools that allow you to view critical information alerts suggesting specific action. Such systems include Enterprise Sustainability Platforms (ESP) complementing FM and AM information with energy management utilization.

Under BI technologies we can include Digital Twins technology. This technology elevates your operations to another perspective by providing virtual access to your physical equipment, operating in a building's infrastructure through your workstation. Digital Twins uses IoT sensors and BMS integration technology creating a digital copy of your Mechanical, Electrical and / or plumbing (MEP) equipment on your server / workstation bridging your physical asset with virtual digital copy allowing you to gather real-time data about your MEP assets and systems in real time and make appropriate decisions.

Artificial Intelligence digital technologies for Asset Management are technologies that use machine learning and high computational models. They process knowledge from previous history records, providing suggestion on possible action for improving the performance of your Assets. The technology utilizes data from CAFM / CMMS, IoT sensors, BMS and BI systems building models of knowledge based on the operational performance of your assets. AI can be used to identify patters providing predictive information for your assets. It "learns" from the process updating its knowledge improving the decision making process and suggestions put forward as the volume of data retrieved increases.

Benefits

There are a number of benefits of how we can improve productivity, quality and at the same time reduce costs by digitally transforming our Facility and Asset Management processes and information. These include:

- Maintain a complete register of financial and technical information

- Classify and identify assets

- Maintain a full history of the corrective and preventive maintenance including down time and other performance of the equipment extending the life expectancy of your equipment

- Manage Assets using international standards

- Use Business Intelligence, Executive Dashboard and Data Analysis tools to

    o Compare equipment performance making better Asset procurement decisions

    o Asset Failure analysis report identifying the root cause behind problems and minimize such problems in the future.

    o Minimize problems with known and consistent failure putting in place strategies to mitigate failures

- o Identify Mean down time report comparing equipment down time. Help identify equipment which are not cost effective and need replacement
- Using IoT, BMS and other on-line digital technologies to ensure performance monitoring and continuous operations of your equipment by maintaining them according to the manufactures recommendation / specification, triggering Preventive and Corrective maintenance according usage and alerts
- Map Assets information and related history against 2D, 3D and GIS models

Procuring and implementing AMS digital technologies guidelines

Everyone wants to use the greatest and latest technologies in the market. Perhaps the number one reason of why digital transformation projects fail is because we try to implement all technologies identified in a road map all at once. The road map should identify the cost effectiveness of every one of the technologies identified so that we implement the most important technologies for the efficient and effectiveness or our FM operations. In addition, the road map should include a feasible plan, digitally transforming pur FM operations into phases.

The second reason of failure in such projects is responsibility and change fear. All personnel directly and indirectly involved in your project must be informed of the change that is about to happen, how will it affect them, your organization and the environment, allocating the appropriate roles and responsibilities. A change management plan must therefore be included in your road map including extensive training to your personnel before the digital technologies are implemented.

Conclusion

We need to walk first before we run. Trying the big bang approach in implementing digital technologies usually ends up in a big failure. Every one of the six digital technologies categories outlined above have a hierarchical dependency relation. That is before you move to a more advance technology category you need to have in place the previous and so on. Each level has its own dependency to processes and data availability. You need to ensure that before you incorporate more sophisticated digital technologies the required processes / data for each technology are in place in both quantitate and qualitative respect. Finally, procuring, implementing and maintaining digital technologies is an expensive process. You need to ensure that the benefits you will be receiving for each digital technology selected justifies the financial and resources investment you require to implement, operate and maintain them.

References

- EN 15221 Facility Management European Standard
- ISO 41001 Facility Management International Standard
- ISO 55001 Asset Management International Standard
- Asset Management Digital Transformation, Andreas Hadjioannou, published 2019
- Pitfalls in implementing Computer Aided Facility Management systems, Andreas Hadjioannou. Published 2020