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Asset management — Guidance on the management of data assets

Gestion ~~d'actifs~~ — ~~Guide des données pour~~ d'actifs — Orientation sur la gestion ~~d'actifs~~ d'actifs de données

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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).

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This document was prepared by Technical Committee ISO/TC 251, *Asset management*.

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.

Introduction

0.1 General

This document ~~provides~~gives guidance ~~for~~on the management of data when applying asset management principles or requirements for an “asset management system”. These principles and requirements are described in ISO 55000 and ISO 55001, respectively. Much of asset management involves decision-making with decisions being reliant on data, particularly for larger and more complex contexts.

This document is intended to facilitate organizations in their management of data in the context of asset management. Effective asset management typically relies on the proper management of data that is pertinent to the assets. Organizations can manage the data as an asset to support their organizational management. This document covers management of data both for supporting the practice of asset management and for handling the data as an asset.

NOTE For the purposes of this document, the ~~term~~term “asset data” is used to refer to data that lists and describes an asset and the term “data asset” is used to refer to collections of asset data that has the properties of an asset.

This document ~~provides~~gives guidance for those who:

- a) are identifying the usefulness or fitness ~~for~~ purpose of data for achieving the asset management objectives of the organization, including fulfilling its accountability;
- b) are involved in the establishment, implementation, maintenance, stewardship, and improvement of data in the context of asset management;
- c) are involved in the planning, designing, implementation, and reviewing of data-based asset management activities along with service providers;
- d) are asset owners, asset managers, information managers, service providers, maintainers, partners, auditors, regulators, and investors;
- e) are the internal and external stakeholders, including internal and external personnel, that affect, or are affected (positively or negatively) by, the management of data in the context of asset management.

Management of data can play a critical role in other management systems as well as in an asset management system. Meanwhile, there can be many benefits for organizations to integrate and implement multiple management systems. The achievement of mutual alignments to other management systems requires an approach based on an appropriate cross-functional data exchange and analysis within the organization.

0.2 Context of this document

Against a background of advances in information ~~technologies~~technology (IT) and diversifying stakeholder demands, how data should be managed in the context of asset management is now seen as a pressing issue for many organizations. As organizations get larger and tend to become more complex, the need for reliable data to support sound decision-making becomes increasingly important. Data acquisition and maintenance is a cost to an organization, while data’s potential value is realized when it is used or can be used in the future. The value of data is diminished if it is unreliable, out of date, and/or applied incorrectly.

Accordingly, the role of data is changing from being a resource that supports management activities to a non-physical asset from which value is generated by being managed in a coordinated way, just like any other tangible or intangible asset.

Data in the context of asset management has its own characteristics as follows:

- a) like physical assets, asset data follows a sequence of life cycle stages; it can be used many times ~~though~~ although the usefulness of data ~~may~~ can change as ~~it~~ move ~~they~~ move along ~~it~~ their life cycle;
- b) data can be stolen if not protected appropriately; such data theft does not bring data loss and can therefore not be immediately evident to an organization yet create sustained negative impacts;
- c) data ~~is~~ are easy to copy, transport and even corrupt, but ~~it~~ they can be difficult or impossible to reproduce if ~~it~~ they ~~are~~ are lost, destroyed or corrupted;
- d) data can be used for multiple purposes; the same data can even be used by multiple people at the same time; similarly, many people and processes can be adding or updating data simultaneously;
- e) data can generate new value when combined with other assets;
- f) many uses of data often lead to more data to handle as a result; most organizations manage increasing volumes of data and the relationships between data sets;
- g) data and information are essential in conducting business within an organization and/or between two functions or divisions; most business decisions from the strategic to the operational level generally involve the sharing of data.

While some of these characteristics are similar to other assets, as a whole, they differ in nature from those of other asset types. This requires different approaches to ensure that the management of data supports its objectives in the context of asset management.

Different data sets may be treated as assets which can be critical to the success of the organization. In such situations, organizations may treat such collections of data as data assets. The principles of asset management described in ISO 55000 should be applied to the management of data assets.

0.3 Relationship to ISO 55000 and ISO 55001

ISO 55000 is the foundation for implementing asset management, and therefore the prerequisite to understand this document.

ISO 55001 can be applied by organizations to establish and implement an asset management ~~system~~ system. This also applies to an asset management ~~system~~ system for data assets. On the other hand, since an ~~organization's~~ organization's asset management system is supported by decision-making based on information or data and its analysis, the process of determining decision-making criteria in an asset management system that meets the requirements of ISO 55001 generally includes the process of managing data. As such, this document facilitates organizations to include data assets within their asset management ~~systems~~ system.

Asset management — Guidance on the management of data assets

1 Scope

This document gives guidance ~~for~~on managing data to support an organization in meeting its asset management objectives and by extension its organizational objectives.

This document is applicable to any organization, regardless of its type or size.

NOTE 1 — This document does not provide methodologies to derive or appraise value for data assets.

NOTE 2 — This document does not provide methodologies to derive financial values for data assets.

NOTE 3 — This document does not provide direction to organizations on the need (or not) for calculating financial values for asset data.

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.

ISO 55000, *Asset management* — ~~Overview, Vocabulary, overview and principles and vocabulary~~

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 55000 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 <https://www.electropedia.org/>

3.1 asset data

data that lists and describes an asset

Note 1 to entry: Asset data can exist in a number of formats such as structured data, documented information, sensor data, etc. requiring different approaches to their management.

Note 2 to entry: Data supporting asset management decision-making can be considered as asset data.

3.2 data asset

~~Data~~ data that has the properties of an asset

Note 1 to entry: Data assets can be managed as an asset ~~according to~~in accordance with ISO 55001.

Note 2 to entry: *Asset data* (3.1) can be part of more than one data asset. Data assets can have relationships between each other.

3.3

type

~~(also known as data type)~~

named category of data characterized by a set of values, a syntax for denoting these values, and a set of operations that interpret, manipulate, or store the values

[SOURCE: ISO/IEC 1539-1:20182023, 3.147144, modified — “or store” ~~has been~~ added.]

3.4

metadata

data that defines and describes other data

[SOURCE: ISO 24531:2013, 4.32]

3.5

data quality

degree to which a set of inherent characteristics of data fulfils requirements

[SOURCE: ISO 8000-2:2022, 3.8.1, modified — ~~The~~ Note to entry ~~has been~~ deleted.]

3.6

interoperability

capability of two or more entities to exchange items in accordance with a set of rules and mechanisms implemented by an interface in each entity, in order to perform their specified tasks

Note 1 to entry: Examples of entities include devices, equipment, machines, people, processes, applications, computer firmware and application software units, data exchange systems and enterprises.

Note 2 to entry: Examples of items include services, information, material in standards, design documents and drawings, improvement projects, energy reduction programs, control activities, asset description and ideas.

Note 3 to entry: In this context, entities provide items to, and accept items from, other entities, and they use the items exchanged in this way to enable them to operate effectively together.

[SOURCE: ISO 18435-1:2009, 3.12, modified — “specified” replaced “respective” in the definition. Notes 1 and 2 to entry ~~have been~~ expanded ~~and note~~. Note 3 to entry added.]

3.7

governing function

function responsible for the strategic guidance of the data governance programme

Note 1 to entry: The governing function is responsible for the prioritization of ~~the~~ data governance projects and initiatives, and the approval of organization-wide data policies and standards, as well as enabling ongoing support, understanding and awareness of the data governance programme.

Note 2 to entry: Depending on the culture of the organization, a governing body ~~may~~ can be known by other names such as the data governance committee, data governance steering council/committee/group, data governance advisory council/committee/group, data stewardship council/committee, data owners' council/committee.

4 Managing asset data

4.1 General

Asset management enables an organization to realize value from its assets in the achievement of its asset management objectives and by extension its organizational objectives. What constitutes value depends on

these objectives, the nature and purpose of the organization, and the needs and expectations of its stakeholders (see ISO 55000).

Many asset management activities rely on effective decision-making which in turn relies on data and documented information. The asset data used by an organization to inform decision-making in turn requires effective management to ensure usefulness to the organization within the required timescales. Suitable accountability and management of ~~this~~these asset data is required to ensure and maintain usefulness.

Asset data can be created, acquired or generated at all stages of the asset ~~lifecycle~~life cycle. Asset data supporting asset management activities is generally required for at least as long as the asset itself exists. Asset data that conformed with the requirements of the organization at the time it was acquired ~~may no longer comply with~~does not necessarily conform to current organizational requirements.

The configuration or nature of the asset can constrain or prevent data acquisition activities and also make it difficult to check or improve incorrect or missing asset data. Asset interventions occur at a discrete period; therefore, subsequent checking or improvement of asset data arising from these interventions requires additional data sources.

4.2 Asset data

4.2.1 Data requirements

The organization should determine its data requirements and manage its data across its life cycle to support the scope of its asset management system to achieve both its asset management and organizational objectives (see ISO 55001:—, 7.6, which also deals with requirements related both to the data themselves and to their alignment across the organization's functions).

In addition, the organization should determine the following:

- a) ~~legal~~Legal requirements: ~~the~~The legal requirements of holding, managing, and transferring asset data;
- b) ~~data~~Data dictionaries: ~~data~~Data specifications and requirements by the organization's management system to enable consistent definition of attributes, units of measurement, criticality, quality, and source for the different types of asset data;
- c) ~~data~~Data frequency: ~~the~~The frequency for updating data; ~~while~~While some asset data ~~may~~can remain static across all life cycle stages, others can be updated in pre-defined intervals of time;
- d) ~~data~~Data volume: ~~the~~The volume of data can determine which tools and storage environments are most appropriate to be used;
- e) ~~data~~Data security: ~~ensuring~~Ensuring that data ~~is~~are protected from inappropriate access, ~~for example~~ (e.g. from loss of confidentiality, improper use, or improper modification including improper additions, alterations, and deletions);
- f) ~~data~~Data availability: ~~ensuring~~Ensuring the availability of data at critical times is defined and it is accessible by the asset management team when required;
- g) ~~data~~Data responsibility: ~~determining~~Determining roles and responsibilities related to the management of asset data.

Where it is not possible for the organization to achieve these data requirements, it is important for the organization to provide direction as appropriate.