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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 42, *Artificial intelligence*.

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Introduction

This document provides a process management framework for using big data analytics (BDA) across most functions of an organization. The quantum of data, the collection, storage, utilization, technology, the speed of data generation, structure and variety of data cannot be handled by the conventional data handling methods and frameworks.

This document provides a BDA process reference model (BDA PRM) and then provides process assessment model (BDA PAM). The BDA PAM are composed of two dimensions: process dimension that includes processes based on a set of PRMs including the BDA PRM and capability dimension based on process measurement framework (PMF).

This document defines a PRM and PAM as part of the framework for big data analytics, in accordance with the requirements of ISO/IEC 33004:2015 and ISO/IEC 33020:2019, for use in performing a conformity assessment in accordance with the requirements of ISO/IEC 33002:2015.

Primary audiences of this document are implementers of BDA in organizations as well as BDA capability assessors. This document provides five process categories such as organization stakeholder, competency development, data management, analytics development, and technology integration.

This framework can be used for:

— managing the processes that are considered to be best practices;

— enabling risk determination and process improvements of the incumbent organization.

Value delivered through automation, either prediction, or decision-making support or both using BDA is valuable to organizations. Implementing, improving, and assessing BDA processes based on this document expect benefits such as:

— competitive advantages;

— better decision-making;

— improve customer experiences;

— sales improvement;

— responsiveness to opportunities and threats;

— mistakes and errors reduction;

— cost reduction.

Clause 5 provides an overview of PRM and Clause 6 details out the specific processes under each process categories for the PRM. Clause 7 provides an overview of the PAM and Clause 8 provides details of process attributes and process performance indicators and Clause 9 provides process capability indicators.

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Information technology — Artificial intelligence — Process management framework for big data analytics

1 Scope

This document provides a framework for developing processes to effectively leverage big data analytics across the organization irrespective of the industries or sectors.

This document specifies process management for big data analytics with its various process categories taken into account along with their interconnectivities. These process categories are organization stakeholder processes, competency development processes, data management processes, analytics development processes and technology integration processes. This document describes processes to acquire, describe, store and process data at an organization level which provides big data analytics services.

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/IEC 33001:2015, *Information technology — Process assessment — Concepts and terminology*

ISO/IEC 33003:2015, *Information technology — Process assessment — Requirements for process measurement frameworks*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 33001:2015 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
big data
extensive datasets, primarily in the data characteristics of volume, variety, and either velocity or variability or both, that require a scalable technology for efficient storage, manipulation, management and analysis

Note 1 to entry: Big data is commonly used in many different ways, for example as the name of the scalable technology used to handle big data extensive datasets.

[SOURCE: ISO/IEC 20546:2019, 3.1.2, modified]

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3.2
data analytics
composite concept consisting of data acquisition, data collection, data validation, data processing, including data quantification, data visualization, and data interpretation

Note 1 to entry: Data analytics is used to understand objects represented by data, to make predictions for a given situation, and to recommend on steps to achieve objectives. The insights obtained from analytics are used for various purposes such as decision-making, research, sustainable development, design, planning, etc.

[SOURCE: ISO/IEC 20546:2019, 3.1.6]

3.3
data governance
development and enforcement of policies related to the management of data

Note 1 to entry: ISO/IEC 38500 specifies six principles of information technology governance: responsibility; strategy; acquisition; performance; conformance; human behaviour. These principles also apply to data.

[SOURCE: ISO 8000-2:2022, 3.16.1]

3.4
benefit
advantage to the organization of the actionable knowledge derived from an analytic system

Note 1 to entry: It is often ascribed to big data due to the understanding that data has potential benefit that was typically not considered previously.

[SOURCE: ISO/IEC 20546:2019, 3.1.1]

3.5
strategic plan
document specifying how data management is to be aligned to the organizational strategy

Note 1 to entry: This term has the same meaning as strategic asset management plan (SAMP) defined in ISO 55000:2014 with data point of view.

3.6
base practices
BP
activities that contribute to achieving a specific process purpose and fulfil the process outcomes when consistently performed

3.7
process attributes
PA
process features that can be evaluated on a scale of achievement to provide a process capability measure

3.8
capability level
set of process assessment indicators that together describe an ability to operate and perform a process at a given capability level

3.9
process attribute rating
judgement of the degree of achievement of the process attribute for the assessed process

3.10
process
process attribute rating
means of assessing the capabilities addressed by the defined process attributes

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3.11
outcome
observable result of the successful achievement of the process purpose

4 Abbreviated terms

BDA	big data analytics
PRM	process reference model
PAM	process assessment model
PMF	process measurement framework
BDAP	big data application provider
BDFP	big data framework provider
BDSP	big data service partner
PaaS	platform as a service
SaaS	software as a service
DevOps	development and operations
IP	information product
PoC	proof of concept
MDM	master data management
EDW	enterprise data warehouse
API	application programming interface
FMEA	failure modes and effects analysis
ER	entity relationship
SIPOC	supplier input process output customer
CTQ	critical to quality
KRA	key result area
KPI	key process indicator
BSC	balance score card
RACI	responsible accountable consulted informed
CRM	customer relationship management
ERP	enterprise resource planning
PoS	point of sale
HRMS	human resource management software

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