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Innovation management — Tools and methods for innovation operation measurements — Guidance

*Management de l'innovation — Outils et méthodes pour les
mesures des opérations d'innovation — Recommandations*

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Foreword

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This document was prepared by Technical Committee ISO/TC 279, *Innovation management*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 389, *Innovation management*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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Introduction

0.1 Why innovation operation measurements are critical for success

An organization's ability to innovate is recognized as a key factor for sustainability, competitiveness, economic success, increased well-being, and the development of society. However, one cannot understand and manage innovation operations without measuring them.

This document guides organizations on the design and implementation of measurements in managing their innovation operations. This document helps organizations think, design, implement, measure and take actions based on measurement results. It provides examples of innovation operation measurements, indicators and metrics, but does not prescribe any specific ones. It is a guidance standard applicable to innovation operations in organizations of all kinds, and sizes and for all types of innovation.

Innovation is characterized by novelty and value creation. Thus, by definition, it involves risk-taking in coping with the unknown and uncertain in a manner fundamentally different from that of established operational activities. Attempting to innovate without acknowledging the fundamentally non-linear, iterative, and high uncertainty-fraught nature of innovation operations invites costly errors, high probability of failure, and needless waste of time, material, and financial resources. Furthermore, in the light of our global and local challenges, as put forward in the UN Agenda 2030 for Sustainable Development, innovation is becoming more needed than ever. Hence, the need for organizations to be able to measure the value created by their innovation operations, their results and outcomes for themselves and their interested parties, while helping to determine the impacts (positive/negative, intended/unintended) they can have on the economy, society, and the environment with regards to the UN Sustainable Development Goals (SDGs).

Measurements, when designed, implemented, and reviewed properly, increase the success ratio of innovation operations. They participate in reducing uncertainty and validating key assumptions that are critical to the success of an innovation initiative (e.g. demand, feasibility, profitability, adaptability), while enabling evidence-based decisions for go/no-go/pivot/refine decisions along the innovation operations.

Measurements also help shape how organizations determine their objectives, generate, and maintain know-how, undertake tasks while monitoring the progress of projects/initiatives, operate with external factors, establish incentives, and assess the results, outcome, and impacts of their innovation operations.

A proper set of measurements contributes to an effective framework for strategic/tactical/operational decision making, planning, value-creation/impact assessment, and overall organizational learning. Such a set of measurements or innovation operation measurement framework, is useful at all levels of the organizations, from top management to people conducting innovation activities on the ground.

The quality of decision-making largely depends on how well the measurements are chosen, implemented, and interpreted. Therefore, organizations can consider the following questions:

- Why measure: Because measurements are essential for understanding the situation, making evidence-based decisions, and managing activities towards success.
- What to measure: Deciding on the indicators providing relevant information on either the situation or the system, or both.
- How to measure: Designing and selecting the appropriate metric for each indicator, i.e. formulae by which the indicator can be valued qualitatively or quantitatively; how to implement the measurement, i.e. select right tools, collect data and analyze it while considering the implied cost and benefits.
- Who should measure: Organizational entities related to the measurement processes and their roles (data retrieval, data synthesis, interpretation, responsibility, and accountability for the measurements).
- Who benefits: The measurements should be adapted to the needs and purpose of the persons implementing and interpreting them.
- When to measure: The appropriate time and duration for doing the measurement.
- Where to measure: In which part of the organization should the measurement be done.

- How to interpret measurements' results and act following the measurements to correct the situation if necessary and to draw relevant lessons.

Measuring is a key management action and should address the following fundamental inquiries concerning the status, evolution, and performance of an organization's innovation operations:

- Are we doing the right things?

Are we aligned with respect to the organization's mission, innovation vision, strategy, policy, and objectives? Are we addressing the most critical innovation opportunities for our organization? Have we gathered the necessary evidence to reduce the uncertainties that are critical to the success of our innovation operations?

- Are we doing these things in the right way?

Do we have the necessary and sufficient leadership, resources, capabilities, effective processes, required support, and organizational structures to proceed towards success legally and ethically? Do we generate sufficient evidence for effective and efficient evidence-based decision-making?

- Are we succeeding?

How well (or poorly) are we doing? Are we achieving sufficiently valuable results and outcomes, thereby increasing our relevance to interested parties? Do we understand the value and impact our innovations are creating on society, the environment, and the economy?

The way people and their activities are assessed and measured has a significant impact on their behaviour, thus requiring careful design of innovation operations measurements to ensure that the right behaviours are nurtured and supported.

There is no universally appropriate collection of innovation operation measurements. Each organization can consider its own dynamic context, the evolving needs, and expectations of its interested parties, its objectives, and its innovation initiatives to devise its own appropriate set of measurements or innovation operation measurements framework.

0.2 Benefits of innovation operation measurements

The benefits of implementing a systematic approach to measuring innovation operations involve the following:

- strategic positioning to focus the efforts and innovation resources on the desired outcomes while optimizing opportunities versus risk;
- enabling an evidence-based decision-making process for determining innovation operational issues, along with their progress, results, and outcomes;
- ensuring adequate and timely resource allocation for innovation operations;
- monitoring the expected progress of innovation operations and adjusting them in time for meeting objectives efficiently;
- generating needed evidence to manage innovation processes for go/no-go/ pivot/ refine decisions to advance innovation activities concretely;
- ensuring that innovation operations management is relevant, ethical, effective, and efficient;
- nourishing an innovation culture that targets value creation, and rewarding and recognizing innovators;
- providing reliable, relevant and useful data on value creation opportunities for attracting investments and the engagement of interested parties;
- ensuring that the innovation results contribute to value creation and the intended impacts of the organization's Innovation Management System (IMS).

0.3 Structure of this document

This document is structured to present measurements concerning innovation operations within an organization. In addition to the Introduction (Clause 0), Scope (Clause 1), Normative references (Clause 2), and Terms and definitions (Clause 3), this document contains six clauses as shown in Figure 1. An introductory Clause 4 provides the fundamentals of innovation operation measurements. Clause 5 provides guidance on measurements related to the context, leadership, planning, and supporting elements of the organization that will trigger or impact innovation operations. Three central clauses provide guidance on measurements for innovation operations at the innovation process (Clause 6), innovation initiative (Clause 7), and innovation portfolio (Clause 8). Clause 9 is dedicated to continual review and improvement of the set of measurements and/or the innovation operation measurement framework. Additionally, Annexes A to E provide detailed examples of indicators and metrics related to Clauses 5 to 8 respectively.

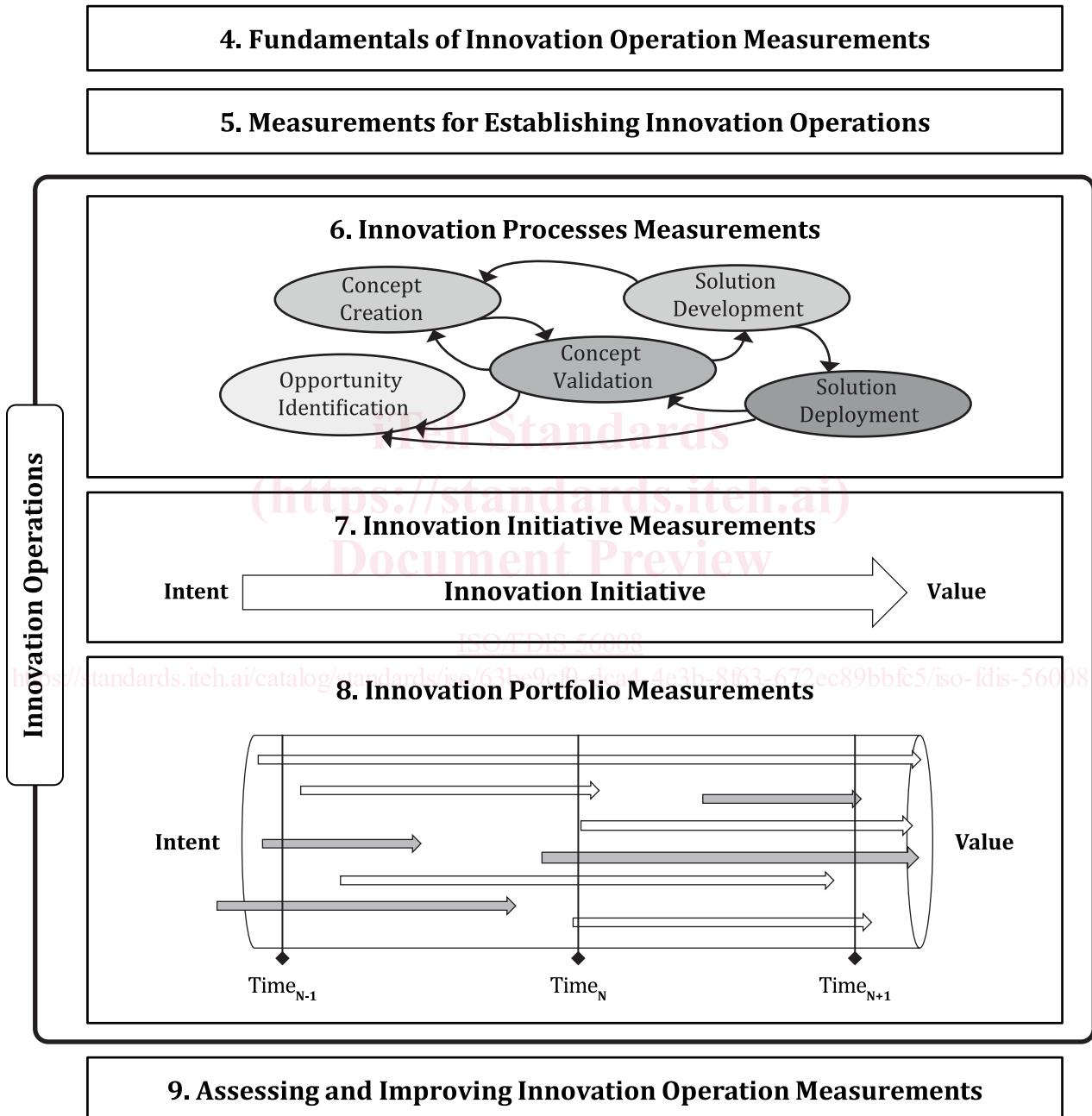


Figure 1 — Core clauses of ISO 56008 (this document)

The core ISO 56008 clauses on innovation operation measurements are as follows:

- Clause 4 *Fundamentals of innovation operation measurements* – provides guidance on the role of measurements in addressing the uncertainties and risks of innovation activities, the high-level processes

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involved, and the leadership, strategy, and planning for effective innovation measurements. This clause also gives guidance in determining what to measure and how to measure it, the design of innovation metrics, and the support required. [Clause 4](#) also includes the basics of data gathering, analysis, learning, and corrective actions engendered by measurements.

- [Clause 5](#) *Measurements for establishing innovation operations* – provides guidance on the measurements required to understand an organization’s external and internal context, including the needs and expectations of interested parties. This clause aims to help to ensure the alignment of innovation operations with business objectives, the adequacy of innovation leadership, the organization’s needed culture, and the effectiveness of innovation planning and support. Such measurements also help gather evidence on the relevant internal-and-external issues and the areas of opportunity for potential value redistribution and value realization that will trigger or impact the course of innovation operations.
- [Clause 6](#) *Innovation processes measurements* – provides guidance on the measurements necessary to support the identification of opportunities, the creation and validation of concepts, and the development as well as deployment of solutions. These measurements should enable better decision-making and advance innovation activities concretely from one innovation process to another based on evidence-gathering and hypotheses validation. Additionally, this clause provides guidance on the measurements needed to detect problems, decide on adequate corrective/improvement actions, and ensure the progress of the organization’s innovation processes.
- [Clause 7](#) *Innovation initiative measurements* – provides guidance on the measurements to be considered during the course of an innovation initiative in order to reduce uncertainties, detect issues, manage risks, undertake corrective/proactive action (including the abandonment of an initiative), and ensure progress towards achieving intended results.
- [Clause 8](#) *Innovation portfolio measurements* – provides guidance on the measurements needed for assessment, management, and decision-making regarding the organization’s portfolio(s) of innovations.
- [Clause 9](#) *Assessing and improving innovation operation measurements* – provides guidance on improving the effectiveness and efficiency of the set or framework of measurements to reflect changes in the organization and its external context, along with changes to its innovation objectives and its activities, or in the case of inadequate choices of either measurements or metrics, or both.

[Annexes A](#) to [E](#) offer detailed examples of key questions to be asked, indicators and metrics related to various innovation operations measurements.

Details on an IMS can be found in ISO 56002. Details on innovation management assessment can be found in ISO/TR 56004. For details on specific innovation management tools or techniques, see ISO 56003, ISO 56005, ISO 56006 and ISO 56007. For common innovation management terminology see ISO 56000.

Innovation management — Tools and methods for innovation operation measurements — Guidance

1 Scope

This document provides guidance for the definition, implementation, evaluation, and improvement of the measurements necessary to effectively manage innovation activities in an organization. It establishes the fundamentals of innovation operation measurements and guides their application towards four areas:

- measurements for establishing and launching innovation initiatives;
- measurements for innovation processes;
- measurements for innovation initiatives;
- measurements of innovation portfolios.

This document is applicable to:

- organizations that are seeking to define and implement an innovation operations measurement approach;
- organizations and interested parties seeking to improve the areas of accountability, transparency, and evidence-based assessment of innovation operations;
- customers, investors, and other interested parties, seeking confidence in the organization's innovation operations management and its results;
- providers of training in innovation operations and measurements, including assessment of and consultancy for achieving results;
- experts in innovation operations evaluation and impact assessment, favoring the use of a harmonized international guidance standard;
- innovation policy makers and program managers who are looking to obtain evidence of progress and desired outcomes of innovation activities supported through public policies and programs.

All of the guidance provided within this document is generic and intended to be applicable to:

- all types of organizations regardless of sector or size, whether they be private, public, not-for-profit, governmental or societal;
- all types of innovations (e.g. product, service, process, model, and method) ranging from incremental to radical;
- all types of time horizons, from short-term to long-term evaluation and measurement.

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 56000, *Innovation management — Fundamentals and vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 56000 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 <http://www.electropedia.org>.

3.1

composite metric

metric (3.13) whose values are defined by a mathematical formula involving other metrics

Note 1 to entry: A composite metric can be created by weighted combinations of two or more metrics, with the weights chosen to emphasize the perceived relative significance of some of the components.

EXAMPLE Culture of Innovation Metric can be calculated as $0,25 \times$ (percentage of people submitting valuable ideas) + $0,15 \times$ (percentage of collaborations without complaints) + $0,35 \times$ (percentage of communicated lessons drawn from failure) + $0,25 \times$ (percentage of people rewarded for innovation).

3.2

evaluation

process of comparing results of analysis to established criteria

Note 1 to entry: Evaluation can be done to determine effectiveness, efficiency, performance, conformity or value.

Note 2 to entry: Evaluations determine the appropriate actions required.

3.3

framework

system of rules, ideas or principles that are used to plan or decide something

3.4

impact

significant effect resulting from a process or activity

Note 1 to entry: Impact can be positive and negative, intended or unintended.

3.5

improvement

activity to enhance performance

Note 1 to entry: The activity can be recurring or singular.

Note 2 to entry: Improvement can be a corrective action happening after *evaluation* (3.2).

Note 3 to entry: Improvement with regard to innovation *operations* (3.15) is a revision of operations and controlling the adequacy of the measurement framework.

Note 4 to entry: Improvement can apply to *metrics* (3.13) as well.

[SOURCE: ISO 9000:2015, 3.3.1, modified — Added Notes 2 to 4 to entry.]

3.6

indicator

specific information on a state, condition or *impact* (3.4)

Note 1 to entry: An indicator can be quantitative or qualitative.

3.7

innovation operation

operation (3.15) with regard to innovation

Note 1 to entry: Innovation operations are all the activities performed to achieve innovations.

Note 2 to entry: Within the context of innovation management, innovation operations encompass innovation activities, innovation processes, innovation initiatives and innovation portfolios.

3.8

innovation operations measurement

measurement (3.12) with regards to *innovation operations* (3.7)

Note 1 to entry: Innovation operation measurements are all the different types of measurements that are necessary and useful for the efficient and effective management of innovation operations.

3.9

innovation operation measurements framework

framework (3.3) with regard to *innovation operations measurements* (3.8)

Note 1 to entry: The innovation operations measurements framework is a system of guidelines that help to consider interrelated *indicators* (3.6), *metrics* (3.13), *measurements* (3.12), processes and policies that are used to make data-driven decisions about the management of innovation operations.

Note 2 to entry: Measurement framework is a way of structuring measurements around the strategy, goals and objectives of the innovation management system (IMS).

Note 3 to entry: This is a system built by each organization to express and interpret its state of innovation operations to guide its data-driven decisions.

3.10

innovation scorecard

assessment of the organization's innovation performance

3.11

input

resources, such as people (with their skills and attitudes), finance, data or knowledge (tacit or codified) that are put into a system, organization, *innovation operation* (3.7) or process

3.12

measurement

process to determine value

Note 1 to entry: The difference between measurement and measure as nouns is that measurement is the act of measuring, and measure is the *result* (3.18) of the measurement.

3.13

metric

defined measurement method and scale

Note 1 to entry: The speed of implementation can be the *indicator* (3.6), but the actual metric would be the amount of time from project initiation to project completion.

3.14

monitoring

determining the status of a system, a process or an activity

Note 1 to entry: To determine the status, there can be a need to check, supervise or critically observe.

Note 2 to entry: Monitoring is the function of using *measurements* (3.12) to observe and track *innovation operations* (3.15) at the levels of activities, processes, initiatives, and portfolios.

**3.15
operation**

performance of practical work or something involving the practical application of principles or processes

Note 1 to entry: An operation is also an activity planned to achieve something.

Note 2 to entry: An operation is an act or process of working, doing something, being in action or having an effect.

**3.16
outcome**

effect of *outputs* (3.17) (e.g. effect of innovations on firm performance) that follow as a *result* (3.18) or consequence

**3.17
output**

results (3.18) produced from a process or activity

**3.18
result**

something that occurs as a consequence, issue or conclusion

Note 1 to entry: A result is the output (3.17), outcome (3.16) or impact (3.4) of an operation (3.15).

4 Fundamentals of innovation operation measurements

4.1 Principles of innovation management and innovation operation measurements

The use of measurements for innovation operations is an intentional and thoughtful attempt to reduce uncertainty. It is necessary to recognize the critical differences between measuring a stable routine process versus measuring either a non-linear or non-sequential innovation process, or both.

Measurement is the basis for all evidence-based decision-making and planning, along with corrective actions, program adjustments, learning for improvement and changes in behaviour. Good measurements and monitoring of relevant indicators drive toward success by focusing on relevant aspects of innovation, reducing uncertainties, while improving communication. This success is based on an accurate assessment that enhances the innovation efforts success factors while avoiding errors and subjective judgment.

The following principles, derived from the IMS, provide a foundation for implementation of innovation operation measurements and can enable

- realization of value, by being consistent with the organization's strategic direction for the creation of short-term and long-term value,
- future-focused leaders, by leveraging measurements to identify impactful trends, identify strategic opportunities, drive high quality trial and error innovation activities, and increase innovation performance,
- strategic direction, by being driven by the intended outcomes and innovation objectives, and enabling an evidence-based innovation operation management,
- culture, by enabling the development of organizational culture, innovation competencies, and inspiring ethical innovation-oriented behaviour,
- exploiting insights, by producing understandable, timely, sufficient, and actionable knowledge that is effective, efficient, and reliable for making evidence-based decisions, increasing objectivity,
- managing uncertainty, by balancing opportunities and risks in innovation operations minimizing waste of resources and efforts,
- adaptability, by enabling shared learning and agility, and