

TECHNICAL SPECIFICATION

ISO/TS 23635

First edition
2022-02

Blockchain and distributed ledger technologies — Guidelines for governance

ISO/TS 23635:2022 - Preview only Copy via ILNAS e-Shop



Reference number
ISO/TS 23635:2022(E)

© ISO 2022



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

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
Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Governance principles for DLT systems.....	1
4.1 Overview.....	1
4.2 Principles.....	2
4.2.1 Principle 1: Define identifiers of entities involved.....	2
4.2.2 Principle 2: Enable decentralized decision-making.....	2
4.2.3 Principle 3: Ensure explicit accountability.....	2
4.2.4 Principle 4: Support transparency and openness.....	2
4.2.5 Principle 5: Align incentive mechanisms with system objectives.....	2
4.2.6 Principle 6: Provide performance and scalability.....	2
4.2.7 Principle 7: Make risk-based decisions and address compliance obligations.....	2
4.2.8 Principle 8: Ensure security and privacy.....	3
4.2.9 Principle 9: Consider interoperability requirements.....	3
5 Governance framework for DLT systems.....	3
5.1 Overview.....	3
5.2 Comparison with other governance frameworks.....	3
5.3 Specific governance considerations for DLT systems.....	4
5.4 Decision rights and decision-making.....	7
5.5 Accountability.....	7
5.6 Incentives and incentive mechanisms.....	8
6 Governance of different types of DLT systems.....	9
6.1 Types of DLT systems.....	9
6.2 Governance in permissioned systems.....	12
6.3 Governance in permissionless public systems.....	12
7 Governance throughout a DLT system's lifecycle and contexts.....	13
7.1 Governance throughout a DLT system's lifecycle.....	13
7.1.1 General.....	13
7.1.2 Governance in the Establish stage.....	14
7.1.3 Governance in the Operate stage.....	14
7.1.4 Governance in the Terminate stage.....	15
7.2 Governance in the DLT systems contexts.....	15
7.2.1 Overview of the DLT governance contexts.....	15
7.2.2 Data context.....	15
7.2.3 Protocol context.....	16
7.2.4 Application context.....	16
7.2.5 Institutional context.....	16
8 Roles in the governance framework.....	16
9 Governance instruments.....	19
9.1 General.....	19
9.2 On-ledger and off-ledger governance instruments.....	20
9.2.1 General.....	20
9.2.2 On-ledger governance instruments.....	21
9.2.3 Off-ledger governance instruments.....	21
9.3 Considerations in implementing instruments.....	21
9.3.1 Adaptability.....	21
9.3.2 Risk.....	22
9.3.3 Privacy.....	23

10 Governance of interoperability	24
Bibliography	26

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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 307, *Blockchain and distributed ledger technologies*.

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

This document addresses how key governance characteristics such as decision rights, accountabilities, and incentives operate effectively and efficiently in DLT systems.

Due to the fast-evolving nature of DLT systems and their adoption, this document has been developed at a level of abstraction to provide guidance and instruction in diverse contexts. “Distributed ledger technologies” (DLT) includes blockchain technologies. The specific blockchain technology will be named explicitly only where specific characteristics of blockchain technologies warrant doing so.

DLT systems challenge our existing understanding of governance as these systems are often decentralized in their governance. In the case of permissionless public distributed ledgers, they can comprise an unrestricted number of potentially pseudonymous DLT users and nodes. Even permissioned public blockchains can have hybrid governance structures, comprising elements of centralized as well as decentralized governance. In the absence of a central governing authority for distributed ledger systems, several governance questions regarding ownership, decision rights, responsibilities and accountabilities, and incentive structures emerge that cannot be addressed by applying traditional governance mechanisms.

Thus, for distributed ledger systems, it is important for participants to establish who they are dealing with (identity) and who is responsible and accountable for the directing and control of the DLT system (governance). For organizations and broader industries, it is difficult to engage in the development of DLT systems in the absence of effective DLT-governance mechanisms.

In general, DLT systems aim for decentralizing decision rights and the technical implementation of accountability. The locus of achieving consensus is decentralized, meaning that the records that form the foundation of the DLT systems are not only distributed but also in many instances validated by multiple DLT users. Moreover, disagreements can be resolved in a decentralized way if users initiate ‘forks’ by copying and branching existing codebases and developing them further according to differing goals.

As DLT systems gain importance, incentive alignment becomes increasingly important. While incentives are at the core of all economic activities, in DLT systems aligning incentives adequately is important for effective functioning because in many DLT systems incentives provide the means of achieving consensus. Unless incentives are properly aligned, the nodes of the DLT system will not contribute to consensus. Improper incentive alignment threatens the integrity of the system and can prevent a DLT system’s effective functioning.

Smart contracts can allow for decentralized governance mechanisms, but many present-day DLT systems continue to be characterized by a degree of centralized, often informal, decision-making. In DLT systems, accountability in principle will increasingly be implemented technically rather than institutionally through traditional contracts.

Smart contracts allow for specifying and enforcing accountability using codified rules on-ledger. However, in some cases it is not possible to implement autonomous transaction enforcement completely on-ledger. In these cases, some form of off-ledger institutional involvement can be necessary for effective dispute resolution among DLT users. The establishment of ‘off-ledger’ governance instruments will be beneficial in assuring participants in the integrity of DLT systems.

Standards in these areas will also benefit DLT developers and providers looking to establish new DLT systems that provide confidence to stakeholders. A key accountability issue concerns identity in DLT systems, usually granted through the public addresses that are used to conduct transactions in public DLT systems. Given multiple and pseudonymous identities, this could be a problem. Some users will wish to identify themselves using traditional institutional means (e.g. driver licenses linked to their DLT identities). Other technical approaches can seek to address the problem of ensuring confidence in user identity, for example by linking reputation to public addresses. Overall, the shift toward the enforcement of accountability through technology has only begun and it is likely that institutions will continue to play important roles for ensuring accountability in DLT systems for some time to come.