

INTERNATIONAL  
STANDARD

ISO/IEC  
15944-21

First edition  
2023-05

---

---

**Information technology — Business  
operational view —**

Part 21:  
**Guidance on the application of  
the Open-edi business transaction  
ontology in distributed business  
transaction repositories**



Reference number  
ISO/IEC 15944-21:2023(E)

© ISO/IEC 2023



**COPYRIGHT PROTECTED DOCUMENT**

© ISO/IEC 2023

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](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
Foreword.....	iv
Introduction.....	v
<b>1 Scope.....</b>	<b>1</b>
<b>2 Normative References.....</b>	<b>1</b>
<b>3 Terms and definitions.....</b>	<b>1</b>
<b>4 Symbols and abbreviations.....</b>	<b>9</b>
<b>5 Ontology of an Open-edi Distributed Business Transaction Repository.....</b>	<b>9</b>
5.1 Transitions of the economic claim in a business transaction.....	9
5.2 Repository of business transaction information.....	15
5.3 Implementation rules of a business transaction information repository.....	16
5.3.1 Rule 1.....	16
5.3.2 Rule 2.....	16
5.3.3 Rule 3.....	17
5.3.4 Rule 4.....	17
5.4 Conforming ISO/IEC 15944-1 properties of an OeDBTR.....	17
<b>6 Conformance.....</b>	<b>17</b>
<b>Annex A (normative) Consolidated controlled vocabulary definitions and associated terms, as human interface equivalents (HIEs), English and French language equivalency in the IT standardization context.....</b>	<b>18</b>
<b>Bibliography.....</b>	<b>21</b>

## 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.

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 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](http://www.iso.org/directives) or [www.iec.ch/members\\_experts/refdocs](http://www.iec.ch/members_experts/refdocs)).

ISO and IEC draw attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO and IEC take no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO and IEC had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at [www.iso.org/patents](http://www.iso.org/patents) and <https://patents.iec.ch>. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

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](http://www.iso.org/iso/foreword.html). In the IEC, see [www.iec.ch/understanding-standards](http://www.iec.ch/understanding-standards).

This document was prepared jointly by Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

A list of all parts in the ISO/IEC 15944 series can be found on the ISO and IEC websites.

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](http://www.iso.org/members.html) and [www.iec.ch/national-committees](http://www.iec.ch/national-committees).

## Introduction

ISO/IEC 15944-4 defines the Open-edi Business Transaction Ontology (OeBTO) as a formal, rule-based specification and definition of the concepts pertaining to business transactions and scenarios and the relationships that hold among these concepts.

Figure 1 overviews the ontology of a business transaction. It is taken from ISO/IEC 15944-4:2015, Figure 21, modified as follows to bring to light certain properties that were not illustrated at the time:

- the generalization of “Partner” to “Person” is according to ISO/IEC 15944-4:2015, Figure 18;
- the business policy connections between the three types (i.e. Economic Resource Type, Economic Event Type and Economic Role) is according to ISO/IEC 15944-4:2015, Figure 13; and
- the connections of party (OeP) and counterparty (OeCP) are shown as distinct persons having negotiated the Economic Contract.

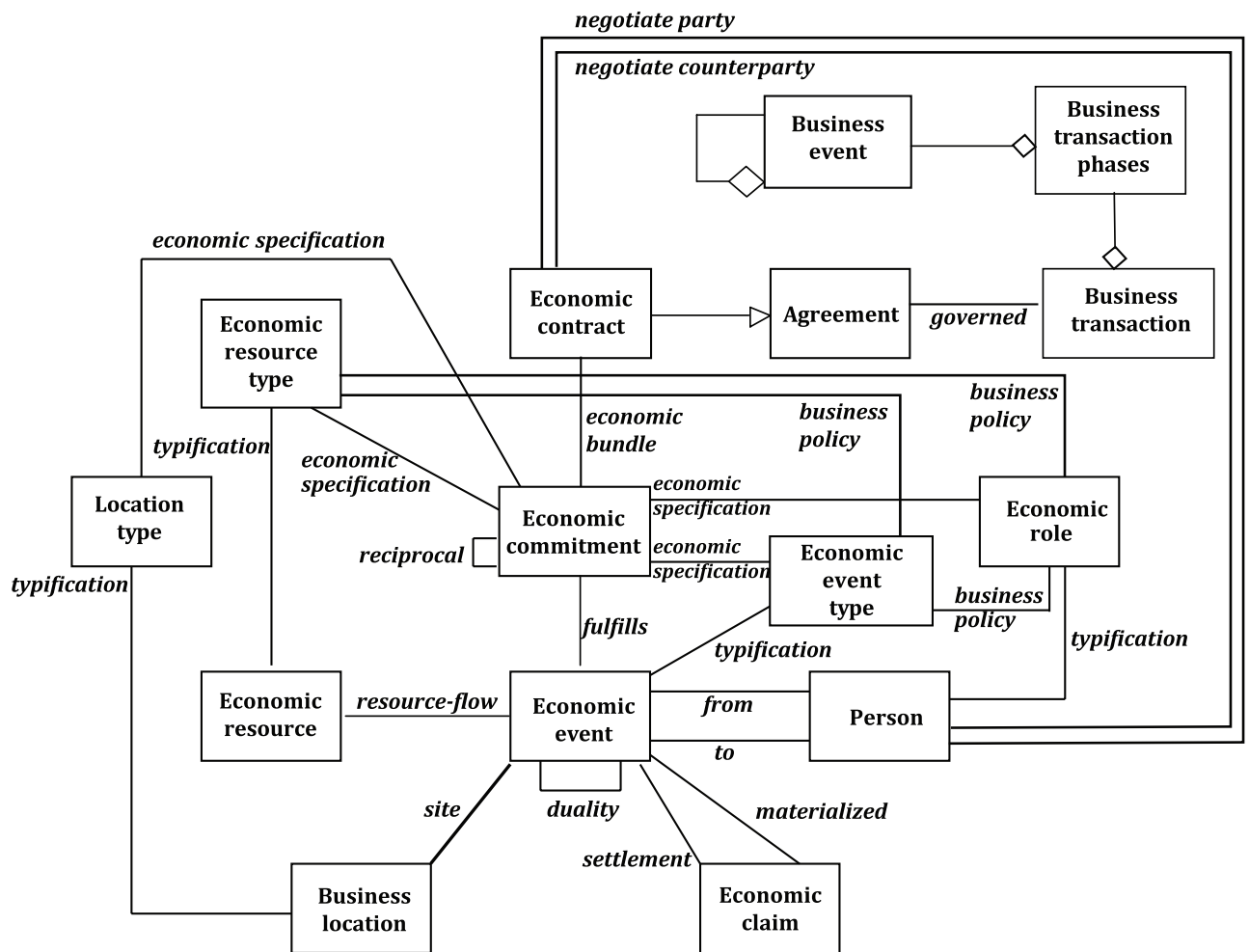
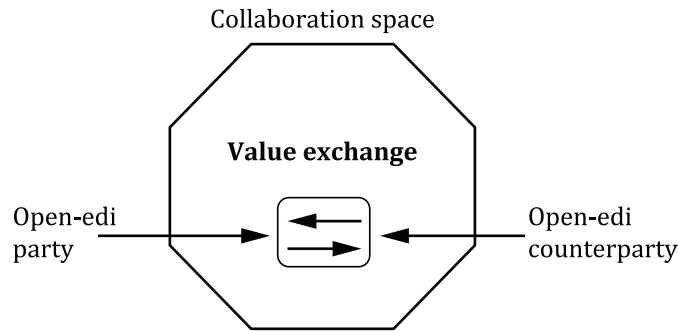


Figure 1 — Open-edi Business Transaction Ontology

According to ISO/IEC 15944-4, each business entity, depicted as a box in the diagram, is a computable representation of a real-world entity that participates, occurs, or is materialized during a business transaction. These are either static representations for the duration of the business transaction or dynamically changing representations implemented as individual state machines. Different business events effecting the business transaction are inputs influencing different sets of one or more of the state machines and changing their individual states. The particular states that each business entity can exhibit are established prior to the business transaction starting in order that the state machines act

as deterministic automaton for the duration. Initiating the business transaction instantiates the state machine of each business entity based on its negotiated definition.

The concept of a business collaboration that is illustrated in [Figure 2](#). It has been updated from ISO/IEC 15944-4:2015, Figure 3 to bring to light the party (OeP) and counterparty (OeCP) as distinct persons of a generic nature, not necessarily a buyer nor a seller.



**Figure 2 — Concept of a Business Collaboration**

The collaboration space captures the information regarding a value exchange between the party and counterparty who have entered into an economic contract. The business transaction occurs within this space. The duality of the business transaction is that it involves two economic events, that is, two transfers of value in the value exchange. One transfer of value is from the OeP to the OeCP, and the other transfer of value is from the OeCP to the OeP.

ISO/IEC 15944-4 describes the ontology as the properties of this active multi-step process of the business transaction between party and counterparty from planning through to post-actualization. The business transaction transits through a series of states, one with each step, with each state stimulus being a business event. After any business event in the business transaction one can view the status of the interrelations between the ontology components as an outcome of that event.

This document supplements ISO/IEC 15944-4 by describing the Open-edi Distributed Business Transaction Repository (OeDBTR) properties of an indelible history or formal record of these changes in interrelations. This history can subsequently be queried or inspected. Without such a history of the state transitions of business entities, there is no record of the life cycle of the business transaction from instantiation to termination.

# Information technology — Business operational view —

## Part 21:

# Guidance on the application of the Open-edi business transaction ontology in distributed business transaction repositories

## 1 Scope

This document specifies the business operational view of an implementation of an Open-edi Distributed Business Transaction Repository (OeDBTR), building on the principles and concepts defined in ISO/IEC 15944-4 of a business transaction. The repository stores the history of the transitions in states of the economic claim and/or other business entities that happen over the course of a business transaction, and does so for a collection of business events. These business events, comprised of transactions and their states, can be identified unambiguously so as to provide the ability to inspect or query the information at some point after the record has been made. The distributed nature of the repository offers users ubiquitous and robust access to the recorded history.

A history of business transactions of market exchanges can be useful in auditing or other memoing-based activities, looking back at the immutable record of the interactions between parties.

This document does not specify the Functional Services View of a particular implementation of an Open-edi Distributed Business Transaction Repository. For best performance, candidate technologies would likely exhibit properties of long-term permanence, robust immutability, decentralized access, distributed resilience, and fine-grained addressability.

## 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 15944-4, *Information technology — Business operational view — Part 4: Business transaction scenarios — Accounting and economic ontology*