

I n t e r n a t i o n a l T e l e c o m m u n i c a t i o n U n i o n

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

F.751.4

(03/2022)

SERIES F: NON-TELEPHONE TELECOMMUNICATION
SERVICES

Multimedia services

General framework for distributed ledger technology (DLT)-based invoices

Recommendation ITU-T F.751.4

ITU-T

ITU-T F-SERIES RECOMMENDATIONS
NON-TELEPHONE TELECOMMUNICATION SERVICES

TELEGRAPH SERVICE	
Operating methods for the international public telegram service	F.1–F.19
The gentex network	F.20–F.29
Message switching	F.30–F.39
The international telemessage service	F.40–F.58
The international telex service	F.59–F.89
Statistics and publications on international telegraph services	F.90–F.99
Scheduled and leased communication services	F.100–F.104
Phototelegraph service	F.105–F.109
MOBILE SERVICE	
Mobile services and multideestination satellite services	F.110–F.159
TELEMATIC SERVICES	
Public facsimile service	F.160–F.199
Teletex service	F.200–F.299
Videotex service	F.300–F.349
General provisions for telematic services	F.350–F.399
MESSAGE HANDLING SERVICES	F.400–F.499
DIRECTORY SERVICES	F.500–F.549
DOCUMENT COMMUNICATION	
Document communication	F.550–F.579
Programming communication interfaces	F.580–F.599
DATA TRANSMISSION SERVICES	F.600–F.699
MULTIMEDIA SERVICES	F.700–F.799
ISDN SERVICES	F.800–F.849
UNIVERSAL PERSONAL TELECOMMUNICATION	F.850–F.899
ACCESSIBILITY AND HUMAN FACTORS	F.900–F.999

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T F.751.4

General framework for distributed ledger technology (DLT)-based invoices

Summary

A DLT-based invoice is an invoice that can be issued, transferred and received in a structured electronic format over digital ledgers which allow automatic, electronic transactions based on smart contracts.

It presents as a novel invoice service category, emerging as a promising solution to tackle challenges by leveraging the capability of distributed ledger technology and the trust requirement of the stakeholders in the ecosystem.

The usage of DLT-based invoices is driven mainly by seeking to optimize an end-to-end trustworthy business process across the jurisdictions in the major processes, e.g., issuance, routing, processing, reimbursement, auditing and so on.

Recommendation ITU-T F.751.4 is not proposing a "regulatory" framework. However, for any tax implications, regulatory considerations must be addressed at a national level and are not the subject of the Recommendation.

The electronic exchange of the invoice content between trading partners' accounts receivable and accounts payable business processes is to be recorded over the invoice digital ledger in a trustworthy way with local tax compliance.

From a technology perspective, how the invoice will be transferred in a secure and interoperable way and how policies in different jurisdictions are enforced needs to be determined. Meanwhile, data privacy, security, trust and confidentiality have to be guaranteed, which is relevant to the following aspects:

- secure messaging infrastructure to ensure that senders and receivers can trust the system and confidently exchange invoices;
- programmable government tax policies that can be securely enforced;
- invoice data validation schemes to ensure the integrity of the invoice content;
- immutability of the digital distributed ledgers to allow stakeholders to store and validate the invoice based on their corresponding privileges.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T F.751.4	2022-03-16	16	11.1002/1000/14966

Keywords

DLT-based invoices, interoperability, security, smart contract.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents/software copyrights, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the appropriate ITU-T databases available via the ITU-T website at <http://www.itu.int/ITU-T/ipr/>.

© ITU 2022

All rights reserved. No part of this publication may be reproduced, by any means whatsoever, without the prior written permission of ITU.

Table of Contents

	Page
1 Scope	1
2 References.....	1
3 Definitions	1
3.1 Terms defined elsewhere	1
3.2 Terms defined in this Recommendation.....	1
4 Abbreviations and acronyms	2
5 Conventions	2
6 Overview of DLT-based invoices.....	2
6.1 Participants	2
6.2 Architecture	3
7 General requirements.....	5
7.1 Identity requirement	5
7.2 Security requirement	6
7.3 Privacy requirement.....	6
7.4 Interoperable requirement	6
7.5 Scalability requirement.....	6
8 Use cases.....	7
8.1 Invoicing process based on payment.....	7
8.2 Invoicing based on contract.....	8
Bibliography.....	9

