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Application of blockchain-based traceability platform for cold chain food

Application d'une plate-forme de traçabilité basée sur la chaîne de blocs

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Foreword

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This document was prepared by Technical Committee ISO/TC 154, *Processes, data elements and documents in commerce, industry and administration*.

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Introduction

With the outbreak of the epidemic since 2019, the safety of cold chain food is drawing more and more attention. Due to that fact that the coronavirus (COVID-19) is cold-resistant, there are high risks that the cold chain food be infected or contaminated by the coronavirus during the circulation of the cold chain link, which can further exacerbate people's panic. Therefore, how to guarantee the safety of cold chain food is a primary and urgent issue expected to be resolved.

Traceability in the cold chain for food is essential in ensuring food safety, through which continuous tracking of the whole lifecycle is realized, including cold chain food production, storage, purchase, sales, and transportation, etc. In this document, a blockchain-based traceability platform is proposed, which links the required data series throughout the circulation of the cold chain food. By applying such a platform, the following benefits are expected:

— anti-counterfeiting: on this platform, each batch of cold chain food in the container is identified by a unique code, which can enable identification of each distinct batch of cold chain food;

— trusted lifecycle tracking: the information throughout the circulation of the cold chain food is written into the blockchain, which is tamper-resistant; and identity cannot be denied;

— supply chain collaboration: the traceability data are shared among the supply chain by leveraging distribution databases/records/ledgers to achieve unified credentials and reduce logistics costs;

— effective regulation: the platform provides credentials for regulatory agencies, and the most important information about cold chain food safety for consumers.

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Application of blockchain-based traceability platform for cold chain food

1 Scope

This document addresses a blockchain-based traceability platform for cold chain food which realizes continuous and effective tracking of the cold chain food. The following aspects are included:

— it explores issues and considerations for cold chain food traceability, especially during the epidemic outbreak;

— it describes scenarios and stakeholders for effective tracking of the cold chain food using the platform;

— it describes data elements and processes for the platform;

— it presents the platform capabilities such as data tamper resistance, sustainability;

— it gives relevant use cases based on the platform.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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
cold chain
temperature-controlled supply chain

Note 1 to entry: An uninterrupted series of storage and distribution activities which maintain a given temperature range. It is used to help extend and ensure the shelf life of products such as fresh agricultural produce, seafood, frozen food, photographic film, chemicals, and pharmaceutical drugs.

[SOURCE: ISO 26683-3:2019, 3.7]

4 Overview

To ensure the traceability of the cold chain for food, stakeholders encounter many problems in the current processes, including but not limited to the following.

— Data integrity cannot be guaranteed for traceability of cold chain food among a large number of parties on the supply chain, such as a massive flow of documents, inefficient manual verification.

— Enterprises are concerned about the risk of core business data leakage when traceability data are made available.

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