INTERNATIONAL STANDARD

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Public transport — Interoperable fare management system —

Part 1:
Architecture

Transport public — Système de gestion tarifaire interopérable —
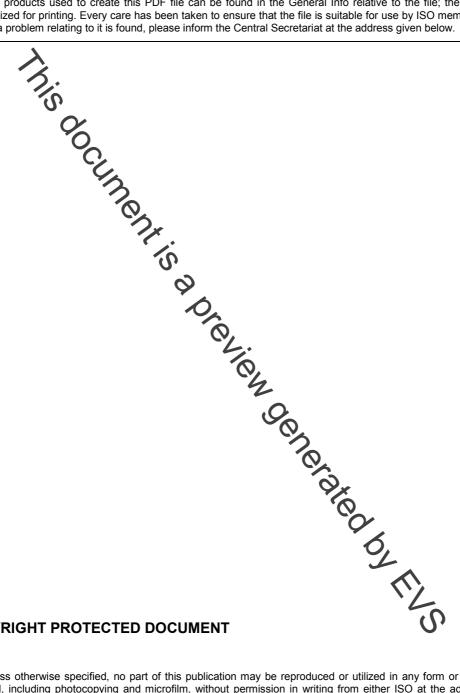
Partie 1: Architecture

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 24014-1 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Road transport and traffic telematics*, in collaboration with Technical Committee ISO/TC 204, *Intelligent transport systems*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 24014 consists of the following parts, under the general title *Public transport — Interoperable fare management system*:

⎯ *Part 1: Architecture*

Introduction

Interoperable fare management (IFM) encompasses all systems and processes designed to manage the distribution and use of fare products in an interoperable public transport environment.

Such systems are called interoperable when they enable the customer to use a portable electronic medium (e.g. a contact/contactless smart card) with compatible equipment (e.g. at stops, with retail systems, at platform entry points or on board vehicles). IFM concepts can also be applied to fare management systems not using electronic media.

Potential benefits for the customer include reductions in queuing, special and combined fares, one Medium for multiple applications, loyalty programmes and seamless journeys.

Interoperability of fare management systems also provides benefits to operators and the other parties involved. However, it requires an overall system architecture that defines the system functionalities, the Actors involved and their roles, the relationships and the interfaces between them.

Interoperability requires also the definition of a security scheme to protect privacy, integrity and confidentiality between the Actors to ensure fair and secure data flow within the IFM system (IFMS).

The overall architecture is the subject of this part of ISO 24014, which recognizes the need for legal and commercial agreements between members of an IFM, but does not specify their form. The technical specifications of the Component parts, and particularly the standards for Customer Media (e.g. smart cards), are not included.

Note that there is not one single IFM. Individual operators, consortia of operators, public authorities and private companies can manage and/or participate in IFMs. An IFM can span country boundaries, and can be combined with other IFMs. Implementations of IFMSs require security and registration functionalities. This part of ISO 24014 allows for the distribution of these functions to enable the coordination/convergence of existing IFMSs to work together.

This part of ISO 24014 is intended to assist the managers of new and existing fare management systems to find a way conveniently to establish Interoperability for the benefit of their customers.

This part of ISO 24014 intends to provide three main benefits.

a) It provides a framework for an interoperable fare management implementation with a minimum of complexity.

b) It aims to shorten the time and lower the cost of IFM procurement, as both suppliers and purchasers understand what is being purchased. Procurement against an open standard reduces cost, as it avoids the need for expensive bespoke system development and provides for second sourcing.

c) It aims to simplify Interoperability between IFMs to the benefit of all stakeholders.

The work has benefited from the architecture work done in Electronic Fee Collection (CEN/TC 278/WG 1) and other domains, including the following:

— ISO/TS 14904, *Road transport and traffic telematics — Electronic fee collection (EFC) — Interface specification for clearing between operators*;

— ISO/TS 17573, *Road Transport and Traffic Telematics — Electronic Fee Collection (EFC) — Systems architecture for vehicle related transport services*;

— existing international data security standards.

Public transport — Interoperable fare management system —

Part 1:
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1 Scope

This part of ISO 24014 provides the basis for the development of multi-operator/multi-service Interoperable public surface (including subways) transport Fare Management Systems (IFMSs) on a national and international level.

This part of ISO 24014 is applicable to bodies in public transport and related services which agree that their systems need to interoperate.

While this part of ISO 24014 does not imply that existing interoperable fare management systems need to be changed, it applies, so far as it is practically possible, to extensions of these.

This part of ISO 24014 covers the definition of a conceptual framework, which is independent of organisational and physical implementation. Any reference within this part of ISO 24014 to organisational or physical implementation is purely informative.

The objective of this part of ISO 24014 is to define a reference functional architecture for IFMSs and to identify the requirements that are relevant to ensure Interoperability between several Actors in the context of the use of electronic tickets.

The IFMS includes all the functions involved in the fare management process, such as

— management of Application;

— management of Products;

— security management;

— certification, registration and identification.

This part of ISO 24014 defines the following main elements:

— identification of the different functional entities in relation to the overall fare management system;

— a generic model of IFMS describing the logical and functional architecture and the interfaces within the system and with other IFMSs;

— Use Cases describing the interactions and data flows between the different functional entities;

— security requirements.

This part of ISO 24014 excludes consideration of

— the physical Medium and its management;

— the technical aspects of the interface between the Medium and the Medium Access Device;

— the data exchanges between the Medium and the Medium Access Device;

NOTE   The data exchanges between the Medium and the Medium Access Device are proposed by other standardisation committees.

— the financial aspects of fare management systems (e.g. customer payments, method of payment, settlement, apportionment, reconciliation).

2   Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1
Action List
list of items related to IFM Applications or Products, downloaded to Medium Access Devices (MADs), actioned by the MAD if and when a specific IFM Application or Product referenced in the list is encountered by that MAD

2.2
Actor
user playing a coherent set of roles when interacting with the system within a particular Use Case

NOTE   A user can, for instance, be a human, an Organisation or another (sub)system.

2.3
Application Rules
Application Owner requirements

2.4
Application Specification
specification of functions, data elements and security scheme according to the Application Rules

2.5
Application Template
technical master of the Application Specification for implementation

2.6
Application
implemented and initialised Application Template on a Customer Medium

NOTE 1   The Application is identified by a unique identifier.

NOTE 2   The Application houses Products and other optional Customer information (Customer details, Customer preferences).

2.7
Commercial Rules
rules defining the settlement and commission within the IFMS

2.8
Contract
agreement between two or more Entities

2.9
Component
any piece of hardware and/or software that performs one or more functions in the IFM