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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

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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).

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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 204, *Intelligent transport systems*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 278, *Intelligent transport systems,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 24014-1:2015), which has been technically revised.

The main changes compared to the previous edition are as follows:

— in order to prepare compatibility of Interoperable Fare Management (IFM) systems with mobility platforms encompassing the entire mobility service chain, functions and roles known from IFM are expanded; and

— new roles are introduced to operate mobility platforms.

A list of all parts in the ISO 24014 series can be found on the ISO website.

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

Fare management (FM) encompasses all the processes designed to manage the distribution and use of fare products in a public transport environment.

Fare management is called interoperable (IFM) when it enables the customer to use a portable electronic medium (e.g. a contact/contactless smart card or a Near Field Communications mobile device) 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.

There are two main changes in this edition of this document compared to the previous edition. Firstly, in order to prepare compatibility of IFM systems with mobility platforms encompassing the entire mobility service chain, functions and roles known from IFM are expanded. Secondly, new roles are introduced to operate mobility platforms. These new roles should act with the roles defined in the IFM and enter into interface relations.

With the introduction of so-called mobility platforms, which can integrate various IFM systems and additional modes of transportation and deliver the travel information across these integrated domains, the customer can benefit from seamless and well-guided multi- or inter-modal travel.

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 also requires 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 document, which recognizes the need for legal and commercial agreements between members of an IFMS, 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 IFMS. Individual operators, consortia of operators, public authorities, and private companies can manage and/or participate in IFMSs. An IFMS can span country boundaries and can be combined with other IFMSs. Implementations of IFMSs require security and registration functionalities. This document allows for the distribution of these functions to enable the coordination/convergence of existing IFMSs to work together.

This document intends to provide the following benefits:

a) It defines a common definition of terms and roles that shall constitute the basis for the other parts of ISO 24014 and technical specifications and technical reports from ISO/TC 204 which address mobility platforms, fare management and interoperability between IFM and other systems.

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

c) It provides guidance on how IFM Managers can benefit from external devices and services and how interoperability and appropriate security level can be established in cooperation with systems from other markets.

d) It aims to shorten the time and lower the cost of IFMS 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.

e) It aims to simplify interoperability between IFMSs to the benefit of all stakeholders.

In Annex A, this document provides a framework for mobility platforms that integrate fare management and travel information for inter- and multimodal travel. This document also contains other informative

annexes, which elaborate on some specific subjects of the document and offer some national examples with regard to IFMS implementations (see Annex B, Annex C, Annex D and Annex E).

Public transport — Interoperable fare management system —

Part 1: Architecture

1 Scope

This document gives guidelines 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 document is applicable to bodies in public transport and related services which agree that their systems need to interoperate.

This document defines a conceptual framework which is independent of organizational and physical implementation. Any reference within this document to organizational or physical implementation is purely informative.

This document defines a reference functional architecture for IFMSs and establishes the requirements that are relevant for ensuring 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 media,

— management of applications,

— management of products,

— security management, and

— certification, registration, and identification.

This document defines the following main elements:

— identification of the different sets of functions in relation to the overall IFMS and services and media from non-transport systems which interact with fare management systems;

— a generic model of an IFMS describing the logical and functional architecture and the interfaces within the system, with other IFMSs and with services and media from non-transport systems;

— use cases describing the interactions and data flows between the different sets of functions;

— security requirements.

In its annexes, this document provides a framework for mobility platforms that integrate fare management and travel information for inter- and multimodal travel (see Annex A). It also elaborates on specific subjects covered in document and offers some national examples with regard to IFMS implementations (see Annex B, Annex C, Annex D and Annex E).

This document does not define:

— the technical aspects of the interface between the medium and the medium access device;