



BSI Standards Publication

**Intelligent transport systems —
Systems architecture — Use of
process-oriented methodology
in ITS International Standards
and other deliverables**

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

National foreword

This Published Document is the UK implementation of ISO/TR 26999:2012.

The UK participation in its preparation was entrusted to Technical Committee EPL/278, Road transport informatics.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© The British Standards Institution 2013. Published by BSI Standards Limited 2013

ISBN 978 0 580 79536 7

ICS 03.220.01; 35.240.60

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 January 2013.

Amendments issued since publication

Date	Text affected
------	---------------

TECHNICAL
REPORT

ISO/TR
26999

First edition
2012-10-15

**Intelligent transport systems — Systems
architecture — Use of process-oriented
methodology in ITS International
Standards and other deliverables**

*Systèmes intelligents de transport — Architecture de systèmes —
Emploi d'une méthodologie orientée processus dans les Normes
internationales ITS et autres produits livrables*



Reference number
ISO/TR 26999:2012(E)

© ISO 2012



COPYRIGHT PROTECTED DOCUMENT

© ISO 2012

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Terms and definitions	1
3 Symbols and abbreviated terms	2
4 Background	3
4.1 TC 204, working group 1 (WG1).....	3
4.2 Systems and architectures.....	4
4.3 ITS architecture development approaches.....	5
5 The process-oriented model	5
5.1 General.....	5
5.2 Stakeholder aspirations.....	6
5.3 Stakeholder needs.....	7
5.4 Functional viewpoint.....	8
5.5 Physical viewpoint.....	14
5.6 Communications viewpoint.....	16
6 Other parts of the description of an ITS architecture	17
6.1 General.....	17
6.2 Identification and version.....	17
6.3 System stakeholder identification.....	17
6.4 Viewpoint overviews.....	18
6.5 Other information.....	18
7 Types of ITS architecture	18
7.1 General.....	18
7.2 Framework ITS architecture.....	19
7.3 Defined ITS architecture.....	19
7.4 Overloaded defined ITS architecture.....	20
7.5 Specific ITS architecture.....	21
7.6 Relationship between the types of ITS architecture.....	21
8 Creating an ITS architecture using the process-oriented model	22
8.1 General.....	22
8.2 Creating a framework ITS architecture.....	22
8.3 Creating a defined ITS architecture.....	23
8.4 Creating a specific ITS architecture.....	24
8.5 Using tools for creating ITS architectures.....	25
Bibliography	26

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.

In exceptional circumstances, when a technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example), it may decide by a simple majority vote of its participating members to publish a Technical Report. A Technical Report is entirely informative in nature and does not have to be reviewed, unless the data it provides are considered to be no longer valid or useful.

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/TR 26999 was prepared by Technical Committee ISO/TC 201, *Intelligent transport systems*.

Introduction

The objective of this Technical Report (TR) is to provide guidance on the use of the process-oriented method (POM), also known as data flow modelling, in the development of intelligent transport systems (ITS) International Standards and other deliverables, and in the design and implementation of ITS systems. In particular, it is intended to be used as the basis for the development of high-level system architectures for ITS. These architectures are tools to aid ITS implementations, and a mechanism to identify and promote the creation and use of standards.

The advantages of applying POM to the development of high-level system architectures for ITS include the following:

- POM is easily understood, particularly by non-technical people (e.g. decision-makers) who are often the intended audience for high-level system architectures;
- POM enables a coherent description to be built up from multiple user views;
- training and tool support is available, particularly in Europe and the USA;
- the data descriptions produced by POM are capable of manipulation by a metadata registry for ITS;
- the results of creating a POM system architecture can be easily transferred into requests for quotations (RFQs), expressions of interest (EOIs), tenders and other similar documents;
- the results of POM system architectures can be translated to UML for use by software developers;
- POM is applicable to both hardware and software and does not, therefore, pre-suppose the form in which its functionality will be implemented.

The disadvantages of using POM include the following:

- POM has a bad image, e.g. it is old-fashioned, and is usually not now included in the training of systems analysts and designers;
- parts of a POM system architecture might require conversion to UML before it will be accepted by most software developers.

There are some risks in using POM, but the benefits of its ability to be easily understood by the usual initial audience for high-level system architectures can often help with the initial promotion of ITS implementations. This TR is intended to provide guidance to stakeholders who are considering the use of POM for ITS.

Currently in preview, click buy full version

Intelligent transport systems — Systems architecture — Use of process-oriented methodology in ITS International Standards and other deliverables

1 Scope

The scope of this Technical Report is the use of the so-called process-oriented methodology (POM) in International Standards, Technical Specifications, Technical Reports and related documents.

This Technical Report discusses the use of POM in the development of high-level system architectures for intelligent transport systems (ITS). It is based on the results of the work of the FRAME-S project and the FRAME Forum. Much of the text from Clause 2 through to the end of the document is therefore reproduced by kind permission of the European Commission and the FRAME Forum.

2 Terms and definitions

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

2.1

actor

sub-element of a terminator

NOTE It is mainly used to enable a particular variant of a terminator to be differentiated from other variants, e.g. to differentiate a public transport vehicle driver from any other type of driver, or all drivers.

2.2

architectural model

model that contributes to the content of an architectural view

2.3

architecture (generic definition)

set of concepts and rules for a system that describes the inter-relationship between entities in the entire system, independent of the hardware and software environment

NOTE Architecture is described through a series of viewpoints that might be at varying levels of generality/specificity, abstraction/conception, totality/component, and so on. See also “communications viewpoint”, “functional viewpoint”, “organizational viewpoint” and “physical viewpoint” definitions below.

2.4

architectural viewpoint

representation of a system from the perspective of an identified set of architecture-related concerns

2.5

architectural description

collection of information items used to describe an architecture

2.6

aspiration

expression of what a stakeholder wants the ITS implementation to provide, usually written in the language of the stakeholder and thus possibly having little or no formal structure

NOTE There could be many aspirations for each ITS implementation, depending on its scope and the number of stakeholders that are involved.