Open Smart Card Infrastructure for Europe

v2

Volume 9:   **Referenced Standards**

Part: **FASTEST Summary**

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1   The FASTEST CEN/ISSS Workshop

1.1   Overview

The FASTEST Workshop was set up in June 2001 by members of Trailblazer 9 (Public Transport) as a mechanism for achieving two of the Trailblazer's objectives:

 a)   producing guidelines that support customers' ease of use of smart card based ICT services and develop a consistency of user experience with the smart card as an interoperable access token in European public transport and across other associated economic sectors such as parking, road user charging, leisure, sports and culture

 b)   producing tools that can assist public transport authorities and passenger transport operators in adopting the concept of interoperability between smart card based products and systems in support of seamless travel.

The Workshop's primary purpose is to produce documents that can serve as practical tools for the drafting of electronic ticketing specifications and European procurement. To this end the Workshop will publish a CEN Workshop Agreement (CWA) by March 2003 containing the following principal parts:

a)   Part 1: EU Policy and User Requirements

b)   Part 2: Development of an Interoperable e-Ticketing System

c)   Part 3: Catalogue of Technical and Business Process Requirements

The Workshop has also performed a survey of e-ticketing systems to provide a Knowledge Base for the internal use of the Workshop. In view of the interest this has created it is intended to standardise the reporting on each of the many schemes identified and publish the results as a useful compendium that can be accessed by other interested parties.

The guidelines contained in the CWA deal mainly with the following aspects of e-ticketing scheme design:

 a)   understanding customer requirements

 b)   understanding EU policy requirements

 c)   identifying scheme characteristics according to operator business requirements

 d)   identifying scheme functionalities with particular emphasis on those necessary for interoperation between schemes

 e)   identifying the main processes involved in the operation of interoperable e-ticketing schemes

 f)   understanding the main design and implementation steps.

1.2 Frequently Asked Questions

1.2.1   What is a CWA?

A CWA is a CEN Workshop Agreement, the product of a CEN/ISSS Workshop.

CEN/ISSS Workshops are open working groups aimed at producing specifications on a consensus basis, as guidance or other material. The Workshops are open to all, they make use of electronic working methods, enabling participation by companies, organizations and academia without the need for attendance in person at the Workshop meetings.

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CWAs may contain technical specifications, but they may also contain guidance material of a purely informative nature, such as guidelines or codes of practice, or they may address the implementation of existing standards.

A CWA reflects the consensus of identified companies and organisations responsible for its contents. Unlike a European Standard, it does not depend upon the votes of national delegations for its acceptance, nor is it designed to support legislative requirements. Instead, its purpose is to offer interested parties a flexible and timely tool for achieving a technical agreement where there is no prevailing desire or support for a formal standard to be developed.

Approved CWAs are published by CEN National Members (the national standards bodies).

1.2.2 Why the need for this CWA?

The members of TB9 decided to form the Workshop and draft the CWA to provide a response to the need for practical guidance and support in the drafting of specifications for electronic ticketing (e-ticketing) systems.

On the one hand, it was considered that there was sufficient experience of customer and operator requirements to achieve wide consensus on the definition of user and functional requirements; on the other there is an urgent need for a common framework that can aid with the design of interoperable e-ticketing schemes.

Despite the national initiatives that are currently underway and despite the standardisation efforts, the sheer scale of the rollout foreseen for e-ticketing in the short-term makes the risk of market fragmentation very high indeed. While the FASTEST CWA cannot provide all the solutions for preventing this from happening, it aims at least to provide a common framework that may:

 a) help scheme operators to design their own e-ticketing schemes

 b) help scheme operators to design schemes that can interoperate with other schemes

It should also be noted that the CWA supports all the existing standards concerning the physical characteristics of smart cards, data architectures and communication protocols. It also anticipates emerging standards for specific data architectures for transport cards and the conceptual framework for interoperable e-ticketing schemes. The CWA will therefore aid with the implementation of these standards, and ensure that scheme operators and transport authorities have a common understanding of the issues in question.

1.2.3 Who should read it?

Anyone responsible for the specification of e-ticketing schemes. This may include decision-makers or scheme designers.

Part 1 of the CWA could be particularly useful to transport planners or their advisers; Parts 2 and 3 are intended more for scheme designers.

In order to provide guidelines that can apply to a large number of ticketing situations, a general framework is proposed with generalised solutions. Of necessity the guidelines do not enter very deeply into technical issues. The CWA aims to provide a common set of tools that can be used to design key aspects of e-ticketing schemes at a fairly high level of specification.

1.2.4 What value will this CWA offer the transport industry in 2003?

The period from publication of the CWA (in early 2003) up to the year 2008 will be highly critical for the transport sector because during this period it is expected that e-ticketing will be introduced on a vast scale. Many of the planned projects will introduce multi-operator fare products for definable areas (regions or, in some cases, nations). The CWA can help the planners of these schemes in the following ways:

 a) By providing some basic principles and clarifying some aspects of e-ticketing scheme design

 b) By providing a common, recognised framework for the definition of customer and operator requirements

c) By providing guidelines that support and comply with current EU policy and international standards and anticipate emerging standards

d) By saving them time and money in the drafting of their scheme specifications.

1.3 CWA Part 1: EU Policy and User Requirements

1.3.1 The European Context

The European Union has published a series of papers, in the form of directives, communications, recommendations and official surveys, that are relevant to the introduction of e-ticketing schemes. The first Part of the CWA commences with a survey of this documentation.

Collectively the EU policy papers and directives constitute a general requirements framework in which specific recommendations for electronic ticketing system design can be elaborated. The EU directives are, after a period of time, transformed into national law in all the European states, and EU policy is also adopted by individual states and regions in respect of the principle of subsidiarity.

By drawing attention to the main principles of EU policy and legislation and forming a set of recommendations on the basis of these, the CWA aims to ensure that transport authorities across Europe can have a common understanding of requirements and a stable basis for the design of electronic ticketing systems.

1.3.2 User Requirements

Part 1 of the CWA addresses the requirements of two principal user categories: the transport customer and the passenger transport operator.

By adopting marketing strategies that aim to attract additional custom from outside their usual catchment areas, operators can reap commercial benefits and improve the services they provide. Part 1 identifies general customer usage scenarios, each of which attempts to describe in generic terms the kind of usage patterns for which e-ticketing using the smart card can be a useful option for transport operators.

The three scenarios identified are not intended to cover every possible usage pattern, but they aim to account for the majority of cases. Recommendations for practical e-ticketing solutions are provided in the other parts of the CWA for meeting the requirements of the usage scenarios.

CWA Part 1 also contains a chapter dealing with general customer requirements for passenger transport services, with some suggestions on how smart cards or other portable electronic devices can be used to improve the quality of service delivery and improve relations in general between operator and customer.

1.3.3 Importance of an adequate Business Plan

The basic requirement here is that of *seamless travel*, as described by the European Community. Seamless travel is defined as the opportunity to move between one place and another with the minimum of inconvenience, according to the customer's own journey plan, using any combination of transport mode or operator. Smart Cards can help fulfil this requirement and thus attract additional custom to operators.

The Business Plan for a new ticketing scheme must in some way seek to balance customer requirements with those of the operator. The customer requires services for which smart cards or other electronic carriers are merely elements of technologies that may be necessary or desirable for the delivery of required services.

Any business plan for a new ticketing scheme must include a risk analysis.

1.4 CWA Part 2: Development of an Interoperable e-Ticketing System

1.4.1 Procurement and Business Strategies

The implementation of an integrated ticketing system is a strategic policy decision, which will have major implications for a transport operator and its customers. Part 2 of the CWA proposes a model for developing a procurement strategy that reflects a scheme operator's business, operational and technical requirements.

The CWA does not propose or elaborate a generic business case or business model for e-ticketing, though it does provide guidance on how transport authorities and/or operators can construct their own model, as well as highlighting the general business considerations that affect scheme design choices. Hence it is incumbent on the passenger transport enterprise[1] using the CWA to elaborate its own business model in order to identify the right design choices recommended in the CWA.

1.4.2 Functional Requirements for Interoperability

The Workshop has identified broad functional schemes that will permit the ticketing systems of different operators to achieve degrees of interoperability. These schemes have been constructed on the premise that a fare product can be considered to be multi-operator if it can be accepted by more than one operator.

The CWA examines the implications of introducing each of these schemes for various usage scenarios in terms of the seamlessness perceived by the customer and the types of agreement that would have to be in place between entities involved in the ticketing scheme.

Part 2 of the CWA identifies the system characteristics and functions that need to be considered for the implementation of the schemes, together with the effects that implementation may have on the various entities involved in fare management. The information collected from the survey of existing e-ticketing schemes will be used to support the conclusions of this part of the CWA.

1.4.3 Security Considerations

Security requirements are fundamental system requirements and should be stated as early as possible in the development and configuration of any e-ticketing system. The quality of definition and implementation of such requirements will determine the essential integrity and fitness for purpose of the system.

The main implication of interoperable e-ticketing is shared vulnerability and shared responsibility. Clearly, the crafting of the business rules that govern the inter-operation is a critical part of its establishment and, as a critical item, must address the criteria, strategy, procedures and methods for isolation and containment in addition to the minimum requirements for participation.

1.5 CWA Part 3: Catalogue of Technical and Business Process Requirements

Part 3 of the CWA will identify and define the roles of parties within an interoperable e-ticketing system. It will do this with reference to the Entity-Relationship model produced by CEN TC 278/WG3/SG5. In addition, this part of the CWA will describe the processes and considerations for developing an integrated e-ticketing system that can meet user expectations for seamless travel and list the business process requirements and technical requirements for system implementation and operation.

1.6 Context of the FASTEST Workshop

A key objective of the Workshop is to lend support to the work of TC 224/WG11 (Machine-readable cards, related device interfaces and operations: surface transport applications) and TC 278/WG3 (Road transport and traffic telematics: public transport) where appropriate. The following diagram is an illustration of the current landscape of work done or in progress within CEN in the area of interoperable ticketing systems.

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[1] A passenger transport enterprise may be a transport operating company or a public authority responsible for passenger transport policy and support or a consortium involving both types of actor.

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Table 1 - Overview of current work on Interoperable Public Transport Ticketing within CEN

REQUIREMENTS ANALYSIS	CONCEPTUAL FRAMEWORK	FUNCTIONAL ARCHITECTURE	TECHNICAL ARCHITECTURE
BUSINESS ARCHITECTURE	E-R MODEL	FUNCTIONAL REQUIREMENTS	TECHNICAL PROCESSES
USER EXPECTATIONS	ACTORS & USE CASES	SYSTEM REQUIREMENTS	FRONT-END DATA STRUCTURES
BUSINESS PROCESSES			FRONT-END DATA ELEMENTS
			BACK-OFFICE DATA STRUCTURES
			BACK-OFFICE DATA ELEMENTS

Key:
- addressed by CEN TC 278/WG3
- addressed by FASTEST
- partially addressed by FASTEST
- addressed by CEN TC 224/WG11
- currently not addressed by CEN

In addition to the CEN Technical Committees identified above, other related work has taken place in parallel to Trailblazer 9. The following initiatives have been observed and are influential on the final output of the FASTEST Workshop:

a)   Other CEN/ISSS Workshops (e.g. Extended URI)

b)   Initiative towards Standardisation : CALYPSO

c)   IST projects, e.g. TRIANGLE, SIROCCO, TELEPAY

d)   National initiatives (e.g. ITSO in the UK, LSI in France, VDV Core Application in Germany etc.)

e)   E-ticketing projects

f)   the other Smart Card Charter Trailblazers

g)   UITP and UIC initiatives.

The FASTEST Workshop has directly interfaced with Trailblazer 9 and established relationships with the other initiatives listed above. This ensures that the Workshop's output is consistent with and supportive of the work of the CEN Technical Committees and applicable to e-ticketing initiatives throughout Europe. The Workshop has interfaced with the other Smart Card Charter Trailblazers through TB9.

1.7 Current status

Part 1 of the CWA has been drafted and is out for comment by Workshop members.

A first draft of Part 2 will be ready for comment shortly. The Project Team will have to commence drafting Part 3 in December 2002 in order to have an acceptable draft ready by the end of January 2003.

It is planned to hold a ballot among Workshop members in February 2003 on the final draft of all three parts of the CWA plus an introductory part (Part 0) included to aid with the reading of the document.

Further information on the CEN/ISSS FASTEST Workshop, together with the documentation produced by the Workshop, can be obtained from the Workshop web site:

http://www.nen.nl/wsfastest

e ESC

Input from Projects

Standardisation

TB 2 4 6 7

TB 9 Public Transport

EU

Regional

National

TC224/ WG11

TC278/ WG3

Input docs

proposal

F A S T E S T

Results

Output docs

Public Domain
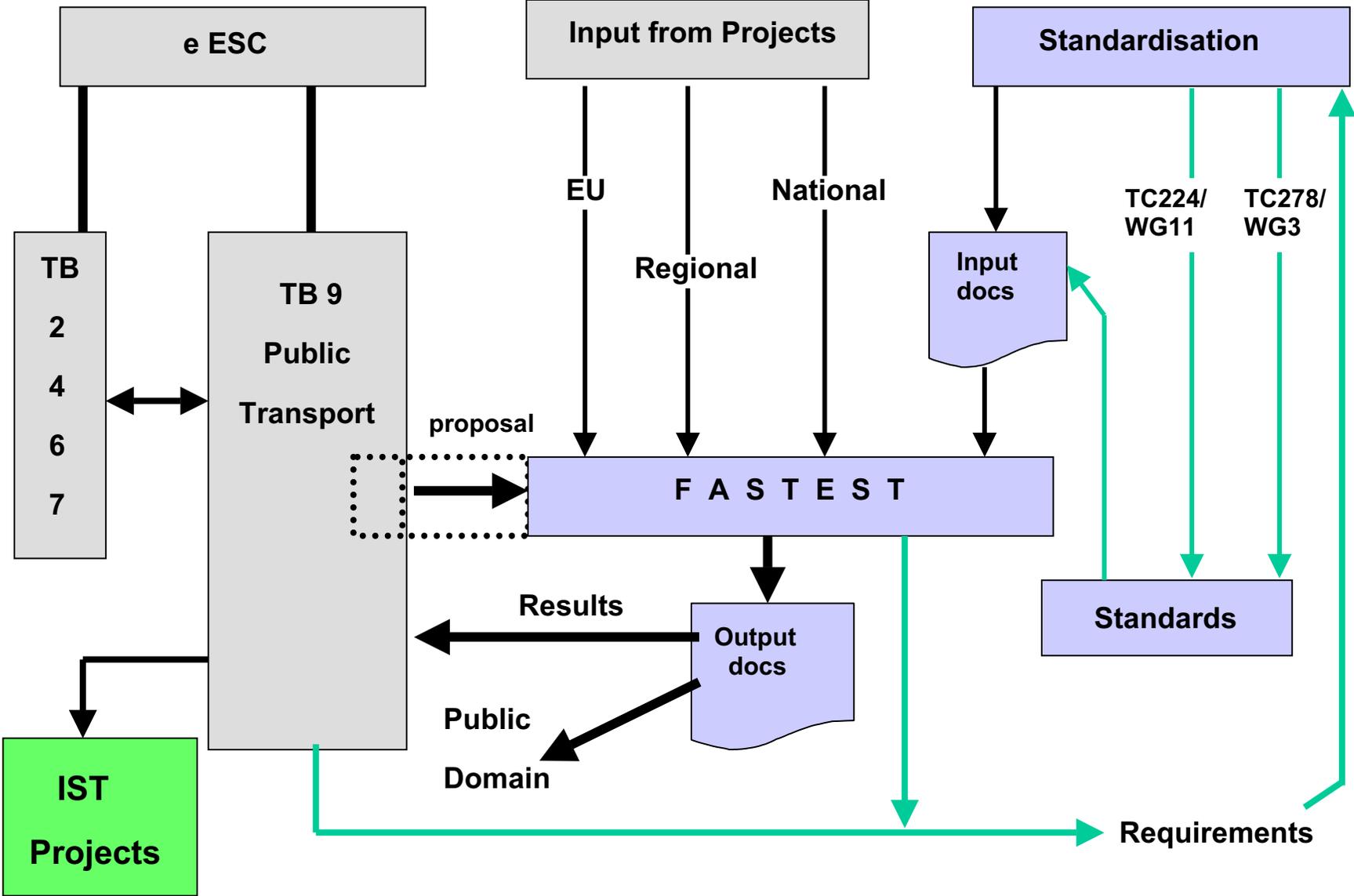
Standards

IST Projects

Requirements

Figure 1 - Relationship of the CEN/ISSS Workshop FASTEST with other European Initiatives