

DATEX II

SUMMARY

Efficient data exchange is needed to provide improved services to travellers through traffic information centres and service providers. DATEX II is the successor of the pre-standard for the exchange of traffic and travel information between traffic management and information centres.

INTRODUCTION

DATEX was set up to improve data exchange between countries and organisations.

The major road network covered by CENTRICO is dense and very heavily used. The collection and dissemination of traffic information and management and control of traffic is difficult when carried out by each region in isolation. The exchange of data, for example, using DATEX links, is essential for the operation of trans-regional services.

The main aim of DATEX is to establish links between Road Operators and Service Providers to allow the easy and efficient flow of Traffic and Traveller Information. Since the first generation of DATEX had been outdated by the rapid developments in the field of data exchange technology and business-to-business interfaces based on Internet standards, a new generation (*DATEX II*) has been developed with strong participation from CENTRICO partners.

DATEX II provides up to date and easy to use technology to exchange data, with a scalable set of interoperable profiles. Most CENTRICO partners have focussed on the Low Cost profile, which is based on the experiences gained within CENTRICO's OTAP community. This interface provides access to the full range of DATEX content whilst at the same time is as easy to set up as an ordinary website.

What is it?

DATEX deserves the merit to have established the

first common traffic and travel related data dictionary for road traffic in Europe. Nevertheless, the outdated exchange specifications based on UN / EDIFACT messages and a circuit switched telephone network paradigm had to be updated, and stakeholders also expected to see new data modelling technologies being applied to provide a richer data model than the old DATEX-Net specifications provided. The challenge was to keep what is good while at the same time improve what was weak or outdated.

The solution was an approach that

- used the *Unified Modelling Language* (UML) for data modelling,
- used the *Extensible Mark-up Language* (XML) for data coding, and
- used the *Hypertext Transfer Protocol* (HTTP) for data exchange.

All three are widely accepted information and communication technology industry standards and therefore allow for the seamless integration of a DATEX interface into existing Internet service infrastructures.

The data model contains different types of information, such as traffic situations, measured data, calculated data and traffic views. The first is the continuation of the prime content of existing DATEX. The latter reflect more recent developments and are therefore less mature. It is expected that stakeholders will use the new DATEX II *extension* feature to

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iteratively improve these information types.

Step 1: model

The DATEX II approach defines a clear set of rules - the *UML profile* - on how to use UML to model DATEX data. The DATEX community follows these rules when maintaining the standardised data model ("level A"). In addition stakeholders requiring context specific extensions for regional / national use or use in specific business environments will follow this set of rules, and benefit from the fact that their extended data is still backwards compatible with the standard and any standard based software package ("level B"). Even users adopting this modelling rules but starting from scratch with a new model (e.g. for innovative applications) will benefit from the collective experience gathered in the DATEX community and receive some initial generic interoperability ("level C"). DATEX II thus strikes a good balance between flexibility and interoperability.

Step 2: encode

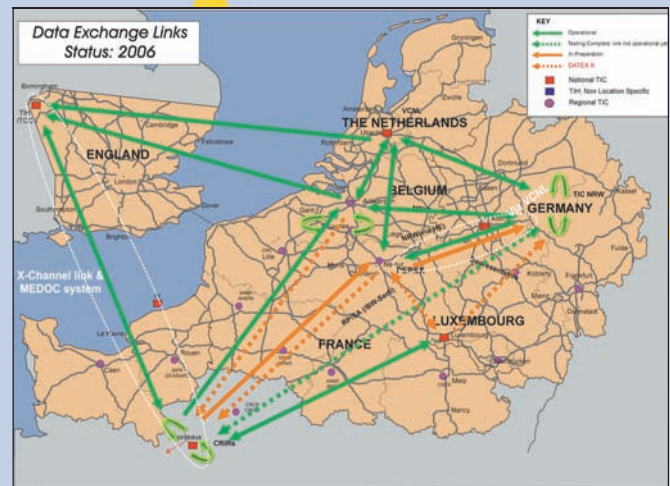
For any data model following the DATEX UML profile, a software tool has been developed that transforms this data model into a schema (according to W3C's *XML Schema Definition* standard). This schema allows the use of standard software packages to *validate* the messages exchanged between DATEX II systems to ensure that the messages are syntactically correct, thus avoid system crashes and loss of data. Furthermore, as XML is a standard feature of current software systems, the basic processing capabilities required for DATEX messages are readily available, which significantly lowers implementation cost and improves quality compared to DATEX I.

Step 3: exchange

The exchange of XML messages encoded according to the DATEX II specifications is preferably implemented on top of standard Internet protocols. This can be either on the 'open' Internet, or via more secure *Virtual Private Networks*.

Stakeholders have distinct requirements and therefore they prefer to use different protocols and features to fulfil their data exchange needs. DATEX II addresses this variety of needs with different data exchange profiles, two currently undergoing tests: The *Regular Profile* offers rich functionality based on the Web

Services family of protocol standards, whereas the *Low Cost Profile* establishes a minimum interface being capable of carrying the full DATEX content while at the same time requiring minimum Internet access features. Both profiles will be interoperable.



The DATEX II 'roadmap'

CENTRICO – together with its sister project SERTI – has volunteered to build a DATEX II demonstrator that will show the operation of both profiles and their interoperability at the i2tern conference in June 2006.

Meanwhile, the DATEX Supervisory Management Committee – together with DG TREN – is working on a DATEX II roll-out strategy for the TERN and beyond. CEN TC278 WG8 (standardisation body in charge of standardising DATEX II on European level) is about to launch first work items that aim at turning DATEX II into a multi-part European standard. At the same time early adopters have already taken up DATEX II and an increasing number of data feeds are scheduled to become available already throughout 2006, providing a wide range of services that reach from traffic situations to travel times, measured data and VMS settings.

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For further information on other CENTRICO activities visit:

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