

HA EU WATCH

ITS in Europe – Identifying Opportunities for the HA ITS Metadata Registry Fact Sheet

■ SUMMARY

The Registry is a repository of data definitions and data models, with an associated supporting process for improving quality and for harmonisation across different systems. The registry aims to cut across separate work areas and avoid re-invention and duplication of effort.

Key features identified by the ITS Registry are:

- Users can discover the kinds of data held in different systems
- By publishing data definitions, system developers make them visible in a standardised format, which encourages others to seek to reuse existing definitions and existing data, where possible
- Through model submission and status reviews, the quality of the data documentation is improved and the chance of data reuse is increased
- The registry process encourages harmonisation of data definitions. This allows users to understand how different data sets relate to each other, and makes system integration more productive
- The registry answers questions for ITS developers, increasing efficiency of ITS development

The Registry is aimed at ITS standards developers as well as those involved in developing, integrating and procuring ITS systems. It is based on UML (Unified Modelling Language), but individual items generally have plain text descriptions and are arranged in a simple hierarchy.

The registry is an implementation of the ISO 14817 standard. This defines the content of ITS data registries, as well as the registration process for entering data into the registry.

The registry can be accessed at <http://www.itsregistry.org.uk/index.html>

■ KEY WORDS

Geographic Information, Traffic Centre, Traffic Information, Traffic Management, Standard

■ DATE OF PREPARATION

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■ BACKGROUND

The HA uses a large number of data sources when making both policy and operational decisions. These data sources are spread throughout the Agency, which can lead to duplication of data, use of out of date data and difficulty in finding relevant data. Recognising the potential benefits of harmonisation of data for the efficiency of information exchange between the HA and its partner organisations, the HA commissioned a research project which was completed in 2005. This recommended a 1 year pilot project to apply the research and explore further benefits. The pilot, implemented by Mott Macdonald, ran from July 2005 to August 2006 resulting in a final report in September 2006. It has subsequently been extended to 2008.

■ WHAT IS THE ITS DATA REGISTRY?

The Registry is a repository of data definitions and data models, with an associated supporting process for improving quality and for harmonisation across different systems. It is aimed at ITS standards developers and those developing, integrating and procuring ITS systems.

The registry contains only metadata. Metadata is loosely defined as "data about data", so the registry describes how data is formatted and the interfaces used to access the data. For example, the registry item "Scheduled Road Works" details how the database of scheduled road works is formatted such that interested third parties can access the data in a reliable and consistent fashion. The actual database of scheduled road works is not stored in the registry.

The key players in the data registry are (from roles defined in ISO 14817):

- **Submitter:** Anybody is welcome to make submissions of ITS data definitions to the registry. Ideally stakeholders in particular sets of data definitions should make submissions.
- **Registrar:** The Registrar is responsible for facilitating the registration of items and for making those items widely accessible to the community. Mott MacDonald is the Registrar for the pilot.
- **Executive Committee (ExCom):** The ExCom is responsible for overall policy and business direction. In the pilot the project management, including Highways Agency, are acting as the ExCom.
- **Steward:** Stewards check the quality of items and propose items for "qualified" or "preferred" status (see below). The TIH Working Group on Data Dictionary and Registry act as the Steward in this trial.
- **Change Control Committee (CCC):** The CCC provides technical direction and harmonisation of registry contents. The CCC is the body that authorises progression to "qualified" and "preferred" status. The TIH Management Group are the CCC.

Accessing the registry.

The registry is based on UML (Unified Modelling Language), so it will be best understood by those familiar with UML. However, the individual items generally have plain text descriptions, and are arranged in a simple hierarchy, so the registry should also be fairly easy to read by those without detailed UML knowledge. The registry is an implementation of the ISO 14817 standard, and some of the detailed terms originate in this standard. Knowledge of this standard is helpful, although much of the knowledge that is required can be found on the ITS Registry site.

The registry provides several top level structures through which to access its content. The diagram below shows the layout and content access interfaces of these structures.

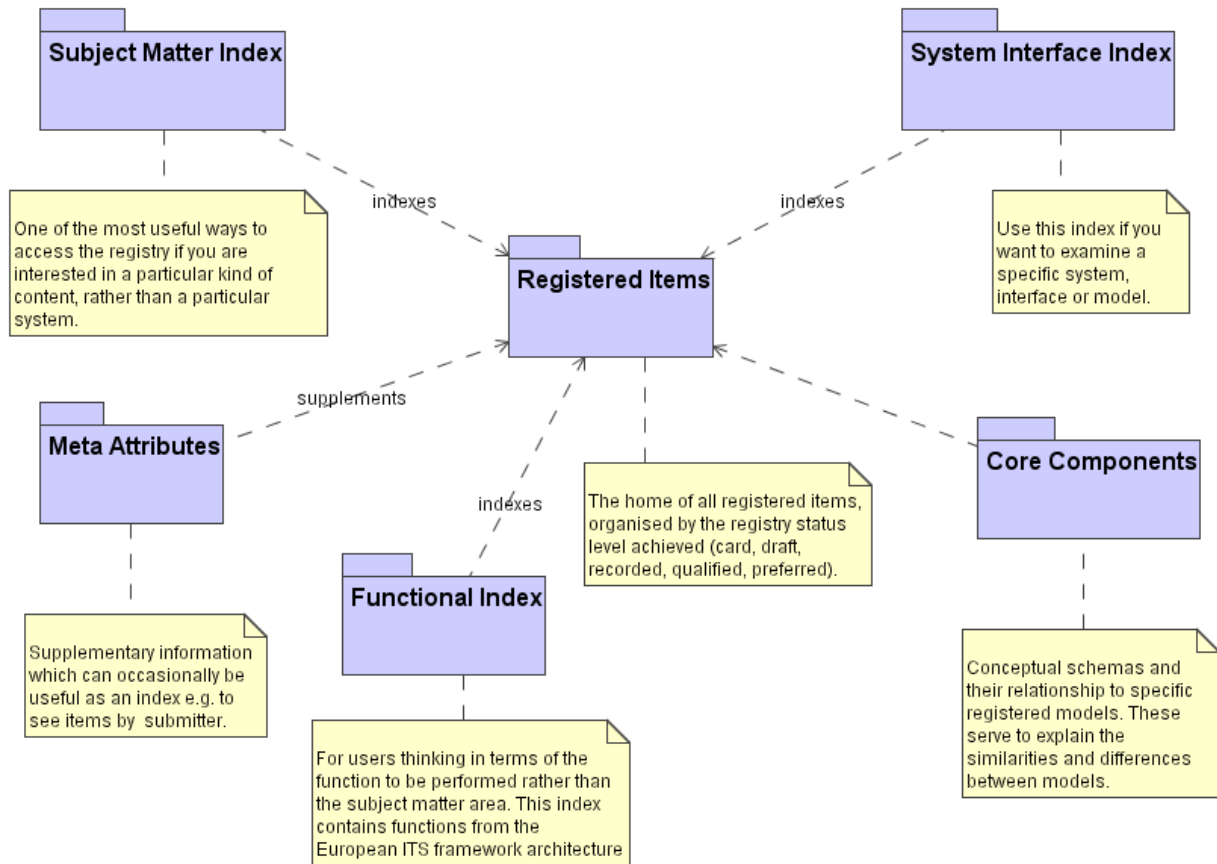


Diagram courtesy of www.itsregistry.org.uk

Status Levels

The data in the registry is assigned a particular status level. The full process is defined in ISO14817, but is summarised below:

- **Card:** A work in progress which may be incomplete.
- **Draft:** Items are complete or near complete but it is known that further submission will be made before quality review. If a model fails to achieve Recorded status, it may be entered at "Draft" level.
- **Recorded:** Items are complete and must have all mandatory meta-attributes completed.
- **Qualified:** Items must have mandatory meta-attributes completed and conform to quality requirements. The Steward makes the decision on quality.
- **Preferred:** The status of "Preferred" is assigned when the Steward and Change Control Committee confirm that the item should be preferred for use in the ITS community.

Harmonisation

Harmonisation is the process producing convergence of data definitions used across different systems, leading to greater interoperability and reuse. Harmonisation is an important function of

a registry process, one that is essential if the largest benefits are to be achieved. The most important harmonisation method used in the ITS Metadata Registry is the technique of "core components analysis". Description of core components analysis is beyond the scope of this fact sheet, but can be investigated in more detail on the ITS Registry website, <http://www.itsregistry.org.uk/harmonisation.html>

■ CURRENT DATA MODELS IN THE REGISTRY

There are currently in excess of 20 data models contained in the ITS registry.

- DATEX II – A specification for the electronic exchange of traffic and travel related data between traffic centres, including cross-border exchange.
- HALOGEN Notification Service – Notification service from Highways Agency HALOGEN system, with information on the status of road management equipment
- UTMC – Urban Traffic Management and Control database
- TransXChange – a nationwide standard for exchanging bus schedules and related data
- HALOGEN OTAP Service – Open travel access Protocol for HALOGEN services
- SDEP - for exchanging streetworks and street events data between systems
- SIRI - an XML protocol to allow distributed computers to exchange real-time information about public transport services and vehicles.
- Scheduled Road Works
- HATMS DATEX II - used by DATEX II services especially extended for the Highways Agency Traffic Management System
- TrafficML - used to aid the exchange of Traffic and Travel Information (TTI) between the TrafficLink company's internal JTNA database system and third-party client applications
- NTCC TIH – National Traffic Control Centre Travel information Highway
- HAPMS - Highways Agency Pavement Management System
- RCC C&C - Command and Control System used in Highways Agency Regional Traffic Control Centres
- OTAP 2 - Travel situation model from the "Open TIS Access Points" (OTAP) initiative, harmonised and agreed in 4 countries (UK, Germany, Belgium and The Netherlands) for the purposes of Travel Information Services
- Journey Time Database
- RTIG 1.2c - Real Time Information Group, set up by Bus Operators and Local Authorities to set standards allowing Public Transport RTI Systems from different suppliers to interoperate within the UK public transport system
- tpeg locML - Transport Protocol Experts Group protocol for Traffic and Travel Information
- tpegML 1.0 – see above
- Transport Direct – an on-line journey planning system
- VIH – Video information Highway aims to provide real-time images of traffic conditions to potential users in a controlled and automated manner
- MATTISSE – Real-time management system for the urban and inter-urban transport network in Birmingham and the West Midlands

■ FUTURE DEVELOPMENTS

The pilot project has been extended to 2008 and will continue to provide a registry service in the context of travel information exchange and support progress in further uptake in other business contexts within the Highways Agency.

■ GLOSSARY

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| CCC | Change Control Committee of the ITS Data registry |
| CEN | European Committee for Standardisation (Comité Européen de Normalisation) |
| C&C | Command and Control |
| DATEX | A specification for data exchange |
| ExComm | Executive Committee, responsible for overall control of the ITS registry |
| HALOGEN | A database which provides storage for NMCS2 logs |
| HAPMS | Highways Agency Pavement Management System |
| HATMS | Highways Agency Traffic Management System |
| ISO | The International Standards Organisation |
| ISO14817 | The ISO standard for data registries in the ITS domain, from TC 204 |
| ITS | Intelligent Transportation Systems |
| NMCS2 | National Motorway Communication System, version 2 |
| NTCC | National Traffic Control Centre |
| OTAP | Open Travel Access Protocol, EU protocol for exchange of real time traffic information |
| RCC | HA Regional traffic Control Centre |
| RTI | Real Time Information |
| RTIG | Real Time Information Group, set up to facilitate exchange of real time traffic information |
| SDEP | Street events Data Exchange Protocol is for exchanging streetworks and street events data between systems |
| SIRI | Service Interface for Real-time Information, a CEN XML standard allowing distributed computers to exchange real-time information about public transport vehicles and services. |
| TIH | Travel Information Highway - an independent association of Information Publishers and Receivers who have an interest in exchanging travel information using an agreed set of Principles. |
| TTI | Traffic and Travel Information |
| UML | Unified Modelling Language, a standard for expressing models, very widely accepted for describing software. |
| UTMC | Urban Traffic Management and Control database |
| VIH | Vehicle Information Highway provides real-time traffic imaging information |
| XML | eXtensible Mark-up Language is a method of representing data and information about the data in a standardised, reasonably human-readable form. |