

Supporting Traveller Information Services (TIS)

Elaborating the Access Point Concept

Key Points

- *Enhanced travel information services will contribute to improved network safety and efficiency by providing users with improved information to make informed travel choices.*
- *There is a need to distinguish between cross-border Traffic Management and the support of Traveller Information Services (TIS).*
- *The current situation is poor at supporting the needs of Service Providers (SPs).*
- *An access mechanism is required for the provision of data that takes into account the needs of SPs, contractual rights and obligations and ease of implementation and use.*
- *The Euro-Regional project partners should set up easy access points for SPs to access the data currently available as laid out in the revised DATEX Memorandum of Understanding.*
- *It is important to note that this paper is an extension of an earlier one, which was an organisational proposal without prescribing its technological implementation. This paper starts to address the functional requirements of the Access Point concept.*

Purpose

This positioning paper describes a proposed development within the Euro-Regional Projects that will more closely link the efforts of the work streams on Traveller Information Services (TIS) and cross-border Traffic Management.

This development aims to support TIS through the provision of “easy access” information services from Traffic Information Centres. This paper compliments a position paper written by the CENTRICO project exploring the policy and background to this need.

The objectives of this paper are three fold:

- To inform the Supervisory Management Committee (SMC), the European Commission and the Euro-Regional projects of the latest position and progress on the proposed development and its implications;
- To gain support and approval from the Euro-Regional projects to investigate this development in more detail;
- To promote discussion at various workshops including the Liege Workshop on Travel Information Services and at the DATEX user forum in Rome.

The paper describes current developments within the Euro-Regional projects. This has led to a concrete proposal for forward development of access points to information for SPs.

This paper elaborates the likely functional requirements arising in relation to the Access Point concept. These functional requirements are likely to vary dependent on the user needs of particular SPs. An example is given for illustration. These concepts have been presented to the DATEX SMC and Technical Committee, various Euro-Regional project committees and has received strong support and endorsement from the DATEX SMC.

The Impetus for Change

On 4 July 2001 the European Commission (EC) issued a Recommendation on the development of a legal and business framework for the participation of the private sector in deploying telematics-based Traffic and Travel Information (TTI) services in Europe. This is Recommendation 2001/551/EC.

This Recommendation states that this framework is to encourage the commercial deployment of value added services offered to travellers, along with the improvement of existing and planned public travel information sources such as broadcast and internet travel news and telephone enquiry lines.

Within the context of this Recommendation there is a need to establish mechanisms for accessing and exchanging data between numerous actors in the TTI provision chain – making information accessible. This demands a limited set of technical solutions, which are tightly defined but also powerful and flexible both in terms of the data that can be exchanged and the functionality that can be supported within the exchange mechanism. The paper discusses the likely functional requirements of the proposed data access methods.

The focus of this paper is on service providers (SPs) – those that use traffic information and the either wholesale it to others for branding and packaging or provide direct to market services as end-user service providers. They already offer a range of service delivery channels (internet, SMS, GSM, TV, teletext, Radio, RDS-TMC, beacon).

With this diversity of organisational needs and operational and service interests there are doubts that the technical capability and organisational management of the existing DATEX specifications can provide a strong basis for this framework. Therefore there is a need for a thorough review of the existing DATEX specifications and on-going developments technical suitability to underpin this framework. There is also a need to review the organisational structures that exist to support, maintain, and direct and manage development of the existing specifications.

Current Developments

During 2001, the EC recognised the need to improve the establishment of the European Network of Traffic Centres (NTC), as specified in the corresponding priority actions of the MIP/TEMPO Programme and the work plans of the Euro-Regional (ER) projects ARTS, CENTRICO, CORVETTE, SERTI, STREETWISE and VIKING. This activity has had a serious lack of progress in recent years.

One of the activities launched to improve the situation was the decision to conduct a series of workshops bringing together representatives at the decision making level, as well as technical experts, to consider the issue of a Network Architecture for the NTC. The first workshop was conducted in Brussels on January 24th, 2002.

Initial discussion at this workshop aimed to determine the state-of-the-art and actions that would improve the development of the NTC. This discussion concluded that many problems spring from the fact that data exchange is currently rarely used in an operational sense. Therefore, the real

needs for data exchange cannot be currently determined, and so it is impossible to guide harmonisation and technical developments.

It also became apparent that there is a need to distinguish between cross-border Traffic Management and the support of Traveller Information Services (TIS) in this respect.

For traffic management, the situation seems to be much more clear and stable than for TIS. The ER project partners are mainly authorities and therefore traffic management, in general, fall completely into their responsibility. Therefore, even with limited operational cross-border management experience, the scenarios can be defined and user needs elicited. It also agreed by the workshop participants that strong bottom-up bilateral negotiations are the only viable approach for cross-border traffic management, as data exchange supports co-operative management operations.

Exchanging data across borders can be seen to be one step in a series of negotiations and developments that lead to co-operative cross-border traffic management procedures. These have impacts on both the operational and technical domains. Such processes need the “project-based approach” to be successful.

For the TIS domain, there seems to be a completely different starting point. The workshop participants recognised that for SPs, especially for those on a pan-European scale, it is not acceptable to start with a variety of different bilateral negotiation processes whose outcome, resourcing and time requirements cannot be pre-determined. A simple solution to accessing data must be offered, supported by consistent comprehensible terms and conditions of access/use, that are available on-line.

Therefore, in this field, substantial improvements can be expected if the ER project partners could agree on an organisational scheme that would make access to their traffic and travel data significantly easier for SPs. This is seen to promote the operational use of this data for service provision.

Proposals for Improved SP Interfaces

SPs are commercial concerns for whom the clarity of the content, coverage, quality, accuracy, completeness and availability of TTI data is much more important than the particular technical features or solutions by which they are delivered. To coin a phrase “Content and Coverage are King”.

This is exactly where the current situation can be seen to be poor.

It is not easy for SPs to get a coherent and consistent picture of what data are really available and under which terms and conditions this information can be accessed, processed and used. Therefore, many SPs are not aware of the potential that the ER projects are able to offer them. Similarly, in reverse, the ER projects have only a very limited view about the needs of SPs.

It was therefore agreed in the ER projects, that the project partners should set up easy access points for SPs to access the data currently available.

However, this initiative should not be seen as only applicable to ER project traffic centres as there are a wide range of road traffic and other centres that could gain benefit from making their data more easily accessible. It is recognised that the requirements and capabilities of SPs who might wish to receive data through an Access Point widely differ. Therefore, a single approach and single technical solution may not prove to achieve general acceptance, adoption and usage. Therefore, this paper focuses on the likely functional requirements that could be expected from this range of SPs. It is hoped that this will open a debate and form the basis for further consultation.

It is important to note that this can be seen as an organisational proposal without prescribing its technological implementation.

Although in an ideal world one would recommend that these access points should be implemented using a common standard, it is recognised that there is no commonly-agreed single platform or off-the-shelf solution in the transport domain today which has been validated in the real world and used in a robust operational environment. However, to progress a reasonable discussion this paper does lay down some potential functional requirements.

SP Access Points – Functional Requirements

The objective is the widespread exchange of travel information through the use of common standards, where they are appropriate, and best practice for the public-sector and commercial interests.

There are contradictory view points concerning the use of standards to achieve a well-defined approach, which should aid widespread adoption, against the use of guidelines which promote flexibility and innovation. This is largely an operational issue that should be market-driven.

Service providers primary concerns, and the driving business case supporting the access point concept, are the following business requirements:

- Easy access
- Good geographical coverage
- Reliable/known quality
- Reliable delivery
- Harmonised descriptions of content
- Accessible and standardised terms and conditions for access

When this is examined at a more technical level, it illustrates that we need a mechanism to:

- describe interfaces (i.e. how to get data).
- describe content (i.e. what that data is – e.g. data dictionary/registry).
- describe quality (i.e. how good is the data).
- locate data (i.e. where does it relate to).
- identify source (i.e. who owns the data).
- help develop interfaces (i.e. development tools).
- specify what technology to use where (i.e. best practice eg protocols and interfaces).
- support commercial exchange (e.g. security, charging, billing, etc).

This mechanism must be:

- Scalable.
- Open and modular.
- Distributed.
- Support automatic processing.
- Off the shelf (as far as possible).

Access points should be implemented using a common agreed approach recognising that their effectiveness will be determined by the ease with which they can be accessed.

All access points should be developed to support the following functionality:

- A data catalogue describing what data is available, the levels of service offered, the quality of the data available, the ownership of the data any commercial terms and conditions applying and a simple electronic interface agreement for accepting those conditions. Ideally a standard methodology should be used to describe the data for example ISO 14817. It is recognised that a data registry will be required to harmonise data types used.
- Be suitable for implementation with a wide range of legacy systems.

- Provide the user with a degree of isolation from database system changes.
- Support machine-to-machine data exchange as well as machine to MMI data exchange.
- A wide range of data types from historic files of network performance through real time network event data and traffic data. It should be possible to expand the interface to handle public transport data in the future.
- Capable of supporting both the push and pull of data.
- Support several compatible/interoperable levels of complexity allowing small enterprises to implement a low cost entry level interface.

Data Access Mechanism

Experiences from with Europe show a range of approaches to accessing traffic information and data. Some SPs seek highly configurable access mechanisms that enable them to access specific data sets that are of use to their services. Furthermore, such SPs often seek direct communication between the data supplier's system and their own – enabling the rapid exchange of large volumes of “customised” data. We will term this the “complex” interface – due to the complexity of data selection methods it supports.

However, it is recognised that such SPs do not represent the whole marketplace, as these data access approaches can be costly, demand expert developers and can only sensibly be warranted in cases where exchanges are going to be made on a regular basis.

The other end of the spectrum could be considered to be those SPs who demand a low-cost, easy to implement “plug-and-play” solution that will provide them with sufficient information when they want it without a significant development effort. This could be termed the “simple” interface – due to its inherent simplicity.

Simple:

The Basic level considers a very simple interface mechanism that would provide a low-cost ease solution to accessing data. This can be considered to be equivalent to a web browser – enabling the user to view data without having much or any control over what data is viewed and little ability to do anything other than view the data.

The simple interface enables the SP to “plug-and-play” (i.e. start accessing data without a large development effort beforehand) but the simplicity of this application also is likely to make the interface's functionality limited. The limited functionality may be considered by some SPs to be overly inflexible. For example, to reduce the complexity of the interface the SP may only be given the opportunity to do very coarse filtering of the data to be supplied – perhaps through a form of drop-down menu, with a limited categories of available data domains. Further functionality to support more customised filtering is likely to increase the complexity of implementation and user experience of this simple interface.

This form of interface may also not be suited for onward extraction and processing of the data in the SP's system.

From a technical viewpoint, it might be reasonable to considered technologies such as HTTP / HTML as a suitable media for this interface.

Furthermore, this access mechanism can be considered as a *pull* mechanism, as the SP initiates a request for data (the *pull*) and receives data in response. This approach does not lend itself to setting up *push* mechanism, where the SP sets a request filter and then the data supplier pushes information in accordance with the request filter.

Due to the coarseness of this access mechanism it may be inappropriate to consider issues like the quality of the data being accessed, or specific mechanisms to support commercial agreement between the data supplier and the SPs. It could be argued that such an interface might support free public access service information through SPs.

Complex/Customisable:

A more complex access mechanism would allow a SP to fully customise the interface with a data supplier. However, this places some demands in terms of technology but also development skills. Across this interface SPs can access and download specifically the data required.

This level just like the intermediate level has the capability of launching a filter on the supplier server. But it does not stop there, with the ability to be very prescriptive of the data required it now becomes sensible to also filter information by the quality of the data. Therefore it is suggested that this access mechanism introduces requirements such as the *quality* of data (how good is the data). Once the SP as the client has the ability to control the data received through control of data quality

then one truly can envisage a commercial data delivery service. This, in turn, introduces the need to have proper commercial agreements concerning data availability (*Service Level Agreements*), *charging* and *billing mechanisms* and fully secure delivery mechanisms (*Encryption*).

As the access mechanism requires a high level of expertise for implementation and configuration the provision of development tools would be beneficial to reduce the development effort.

This access mechanism is a *pull* and *push* mechanism.

For this data delivery IOP/CORBA could be used as the transport mechanism

Summing up the Access Point Requirements

The access mechanism variants considered are summarised in table 1:

| | Security | Agreement | Source | Location | Interface | Description | Catalogue | Filtering | Quality | Development Tool | Service Level Agree. | Charging & Billing |
|---------|----------|-----------|--------|----------|-----------|-------------|-----------|-----------|---------|------------------|----------------------|--------------------|
| Simple | • | • | • | • | • | • | | | | | | |
| Complex | • | • | • | • | • | • | • | • | • | • | • | • |

Table 1

Table 1 is not meant to show a definite list of requirements of different styles of access points – these examples are illustrative. However they are provided that the scope and levels of functionality do not have to be uniform across all solutions and that a variety of technical solutions may be appropriate for different user needs.

Potential Technologies for Implementation

Although many of today’s key technologies offer promising approaches to allow for standardisation of access points, it has been recognised that this process will require time, development effort as well as operational experience and a clear understanding of the range of user requirements that may come from various SPs.

Therefore the workshop participants suggested that these access points should be created and used widely, they would provide the potential to collect real world experience leading to harmonisation and finally to standardisation by market forces rather than those of an academic exercise.

It is key to the success of this proposal that these interfaces make information easily available. The internet was mentioned as an appropriate network platform both for a repository of a description of the data and access definition as well as for the actual access to the data. However, such technical details are beyond the scope of this paper.

There is a clear need for an investigation of suitable technologies and the potential requirements if this proposal is to be progressed. This investigation is likely to cover a range of potential technologies, many of which are of interest to different interest groups already.

Interconnection of Domains

The proposed approach seems to provide a substantial input to the related initiative of the CENTRICO Communications Architecture Workshop. The initial CENTRICO ideas that launched the initiative aimed at clarifying the Architecture of Communications relationships between the CENTRICO partners. This included the idea of central points of access for Germany and Belgium.

It should be fairly straightforward to extend this discussion to incorporate central points of access for SPs in many countries. The main issue to deal with it would be the appropriate geographical granularity for these access points, addressing aspects like ownership of data, responsibility for quality of service, and decisions on harmonisation of approach.

Conclusions

Slow progress has been seen on the development of the NTC in Europe. Access to available data by SPs is also limited and issues of the choice of technology and perceived cost of implementation is stifling the growth of traveller information services with the European TTI marketplace.

The proposed development of data access points for SPs offers substantial improvements if the ER project partners could agree on an organisational scheme to achieve these access points.

It can therefore be concluded that this proposal, if utilised properly, has the potential of real improvements for the utilisation of TTI and the reduction of tensions between key players inside the ER projects as well as between the ER projects and the European Commission.

We need a mechanism to:

- decide where standards and best practice are required.
- decide what and best practice should be.
- ensure there are mechanisms in place to make them happen.
- inform SPs and win their support for the current initiative.
- review the ongoing needs of the travel information community in terms of standards and best practice.