its-ch *Swiss Platform for the Promotion of ITS*

Priority topic:
Developments in neighbouring countries offer potential for synergies

A closer look at the topic: Data become information

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The discussions on specifications for real-time traffic information services (RTTI) in the EU have shown that opinions still differ on the question of how data and information should be available. A simple example illustrates how information can be obtained from data. It clearly shows that an innovative market with information offerings can be created when data are as freely available as possible.

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1 Status and development

1.1 International trends

In June, the 10th **ITS European Congress 2014** was held with the title: “ITS in your pocket” (www.itsineurope.com/its10). The objective was to show how smartphones can take ITS forward. The idea is that the focus should no longer be on a mode of transport but on the users who, as travellers, switch between modes of transport - and a smartphone is a modern information device that most travellers always have with them. Already today, travellers communicate with one another via smartphones, and in some cases even with means of transport or the transport infrastructure (and thus with their operators and regulators). If smartphones are integrated into means of transport, such as cars for example, the latter will be able to communicate directly with one another or with the infrastructure, and so in the case of cars implement C2X. The organizers had the courage to keep the Congress simple. Thus the problems of ITS were no longer concealed behind technical mumbo-jumbo, as is shown by the following examples:

- In the competition for **smartphone apps** it was mainly young people who presented new ideas. But these apps will only work if access to data is easy. If app developers were to have to grapple with licensing and liability issues, and even call in lawyers, it can be expected that they would jump off the ITS train. Service providers dealing with ITS for the first time have shown by means of examples that simple data exchange is possible.
- For travellers, journeys should become easier with “**Mobility as a Service**”: a kind of season ticket customized for travellers and valid for all means of transport – i.e. also for cars or taxis. This raises new questions: would mobility increase as a result? Is European anti-trust law an obstacle to “Mobility as a Service”? What is certain is that this idea will fundamentally change travelling.
- Driving a car should become easier with self-driving vehicles (**autonomous driving**). Once again an outsider - Intellectual Ventures - has put its finger on the sore points: in their view, the industry has to develop a risk appetite. Today it is caught up in the discussion of liability issues. And: what is needed is an ecosystem for cooperation. Finland is heading in this direction with the requirement that self-driving cars will have to manage with the existing infrastructure. Whether meticulous mapping is the right way to achieve this seems questionable because of the enormous effort. One alternative would be real-time “mapping” via crowdsourcing.

The above ideas are in the process of being implemented:

- The Netherlands will no longer be investing in installed information infrastructure, for example, they will not install any more variable message signs (VMS). Instead, private service providers are to inform road users via smartphones. The regulator will only intervene in future when the mobility objectives are at risk.
- Gamification of traffic information (for example, the app Waze) is gaining in importance. Last year, this topic was only reluctantly included in the conference programme; this time it even won an award as the “best paper”.

So ITS is moving after all: the Congress showed that progress is possible, even though promising ideas were presented above all by non-established speakers.

1.2 EU

eCall: The EU Council and the European Parliament have not yet been able to agree when all newly type approved vehicles will have to be equipped. A date earlier than April 1, 2018 cannot be expected.

MTI/RTTI forum: In October, the EU organized a forum for EU Member States to discuss how the two specifications on real-time traffic information services (RTTI) and safety-related traffic information (MTI, [EC REG 886/2013]) can be implemented. The topic was the national access point for data and how its function can be ensured (see also Section 3.2.).

C-ITS platform: The European Commission would like to promote widely-used Cooperative Systems (C-ITS). It intends to submit a report on the topic by the end of 2015. To discuss the various aspects of C-ITS, it has created a platform to which all stakeholders can contribute. The first discussions on November 3 showed that self-interests are still being vigorously defended. Access to data and related retrofit scenarios are con-

troversial, among other matters. Thus there is a risk that C-ITS will continue to be used only sporadically, which is of limited use to traffic management.

EIC: On November 4 in the European ITS Committee (EIC), the European Commission presented to the Member States the report on the implementation of the ITS Directive [EC DIR 2010/40] [EU COM (2014) 662], [SWD (2014) 319], [SWD (2014) 320]. The report comes to the conclusion that the priorities of the different implementation elements of the Directive need to be adapted. It may even be that a revision of the ITS Directive is necessary. As already for eCall, regulations might also become necessary which go beyond the specifications according to the Directive.
The specifications for real-time traffic information services (RTTI) are ready for adoption. They should be published in spring 2015.
Work has started on the specifications for multimodal travel information services.
The EU is in the process of compiling a database for static information on truck parking spaces, as defined in the relevant specifications [EC REG 885/2013].

TEN-T: With the Trans-European Transport Network project (TEN-T), the EU is also promoting ITS implementations. FEDRO is participating in the Ursa Major project (formerly Chameleon), which intends to use ITS applications for heavy goods vehicle traffic on the corridor from the Netherlands to Italy (http://ursamajor.easyway-its.eu/). TEN-T is also promoting the European ITS Platform + (EIP+, http://eip.easyway-its.eu/). It is concerned about the harmonized introduction of ITS. FEDRO is collaborating in the area of data quality.

1.3 ERTICO

TM2.0: The Traffic Management platform 2.0 was established in June (TM2.0, http://tm20.org). It is intended to promote the exchange of data between the navigation service providers and the traffic management centres, for example, dynamic vehicle data and current traffic control measures. FEDRO is a founding member and hopes the procedures for data exchange will be simplified.
iMobilityForum: The Plenary of the iMobilityForum (www.imobilitysupport.eu) took place in April. It aims to set priorities for research and innovation in ITS and to foster discussion among all stakeholders. The Forum has recognized that not only technical aspects are important if ITS is to be successful. Thus one group is concerned with the Human-Machine Interface (HMI). One question in this regard is what smartphone apps should look like so as not to distract people from driving. With regard to automated driving, groups were set up which will examine how such vehicles can be introduced in today's traffic and which legal aspects need to be considered.

1.4 asut Swiss Telecommunication Summit

In June, asut organized the Swiss Telecommunication Summit on the topic “ICT goes mobile” (www.asut.ch). The telecommunication industry is expecting that hundreds of millions of devices in Switzerland will communicate with each other. If this is to be done successfully, fragmented offerings have to be brought together. Uber (www.uber.com) shows how this could be done with its driver service. The social aspects should not be forgotten here, including data protection. Over the years the telecommunication industry players have learned to cooperate with each other, despite competition. Some interesting developments are therefore to be expected on this front, as Deutsche Telekom is showing in China with its commitment to networked vehicles [Autos, heise. 2014].

2 A closer look at the topic: Data become information

2.1 Data or information?

Data are defined as numerical values or results obtained from measurement or observation. Information can be described as news or messages. (Confusion can be caused by the fact that in computer technology stored information is understood to be data.) Based on the original definitions, information is obtained from data: useful decision-making aids are extracted from raw figures.

2.2 How do data become information?

The example of an analog display indicating whether one should use a bicycle or the tube, illustrates the process by which data become information (Bicycle Barometer: http://hackaday.com/2013/02/01/barometer-tells-you-to-take-your-bike-or-the-train/ see figure below):

The need is to know as quickly as possible which of two modes of transport is more suitable to go to work. In this case it depends on the weather, the status of the tube trains used and the status of the tube station used. It is true that their data can be seen individually: the weather certainly, but also the status of the tube trains and stations (https://www.tfl.gov.uk/tube-dlr-overground/status/) But the idea is to get an overview immediately for one's own situation.
In order to be able to process the data, they have to be available in a machine-readable format. In this example, three different data sources have to be tapped. For the weather, registration is necessary (http://www.metoffice.gov.uk/datapoint), for the tube, the sources are directly accessible (https://www.tfl.gov.uk/info-for/open-data-users/).

2.3 Challenges

Which information do users want? For them, it is important to get a quick overview. Whether or not every subsidiary aspect is taken into account, is of secondary importance. Consequently, the information displayed always involves a degree of error. The developers' skill lies in maximizing the benefit in such a way that errors due to simplification no longer matter to users. This has been achieved with the Bicycle Barometer.

Where do the data come from? They have to be accessible in a simple way. Otherwise there is a danger that developers may lose interest in new applications if they were, for example, to have to call in lawyers to resolve licensing issues. For the Bicycle Barometer - a simple application - three data sources are already necessary. Registration is necessary for one. The other two can be accessed directly. No costs are incurred for any of the three sources. The easier the access, the more readily applications will be created - particularly new ones - which combine different sources with one another. Open-data models are promising for this:

their data are free of charge (at most marginal costs are incurred) and their licensing is for the most part manageable. The data also have to be easy to read for the IT tools used. The data should therefore be available in commonly used formats. The Bicyle Barometer is based only on data from public services and even here some small hurdles have to be overcome. If data from private service providers have to be accessed, extensive negotiations over price and purpose of use are often necessary.

With which model do data become information? In order to display data clearly, they must be selected and evaluated according to various criteria. In the Bicycle Barometer example, the weather is important, in other words, under which weather conditions does it make sense to cycle and when does it make less sense? The answer to this question can be quite individual. Then: is the current weather determining or should forecasts be incorporated? In addition, road conditions could also be included (but that is not the case in this example). Regarding the tube, it is important whether the station of departure is open, but destination or interchange stations can also be included. In addition, the load factor on the tube should be taken into account. Finally, the assessments of the weather conditions and the state of the tube have to be compared with one another. How they are assessed depends not only on the individual users, but also on various subsidiary constraints such as journey time, any transfer times or road works. The trick is now to process all these assessments and subsidiary constraints by means of a model in such a way that the users obtain usable information. This effort is considerable, particularly when the information should be kept as simple as possible. Various solutions are conceivable. That is precisely what the innovation is. For this, the developers should be remunerated at free market prices.

With Open Data to a variety of information: Everyone participates in traffic. Some have ideas on how to make it simpler to use. Implementing them is relatively easy with today's IT tools, if the data are readily available. Then the developers can concentrate on devising the best possible model for presenting the information. That is precisely what the Bicycle Barometer shows: that surprising traffic information applications can be created when the corresponding data are easy to procure, preferably via an Open Data model. A simple Swiss example of this is the FOEN hydrological data (http://www.hydrodaten.admin.ch/de/). They are made available simultaneously via a web interface and in machine-readable XML (http://www.hydrodaten.admin.ch/lhg/SMS.xml). They then gave rise to smartphone and web apps of the most diverse kinds, such as those providing information on swimming in the river Aare: some unexpected new applications were able to be created with dry data.

3 Conclusions/Activities

3.1 The issue

Diverse forms of traffic information or also traffic applications can be created if the necessary data are easy to obtain. That is what the app competition at the 10th European ITS Congress showed and it can also be seen from the unusual example of the Bicycle Barometer described above. But often only public-sector data are relatively easy to access; for private-sector data, it is usually necessary to overcome various licensing and contract-law hurdles. But a combination of the most diverse data sources of private and public origin is essential, precisely for intermodal traffic information.

3.2 Possible solutions

International

Business models with privately-sourced Open Data are perfectly conceivable, as was shown at the 10th European ITS Congress. But the majority of the industry is still having difficulty with such ideas. This is reflected in the EU's expert discussions on the specifications for real-time traffic information (RTTI): existing services are to be retained, although the English word "preserve" also implies their protection. Although the experts discussed separating data and information, this idea has been watered down in the current text. On account of the principle of transparent public administration, the public sector is required to make its data available according to the PSI Directive [EC DIR 2003/98]. The effort required to do this is considerable. The RTTI specifications require that a national access point for data - both public and private data - must be created (but that does not mean they have to be available free of charge). Access to RTTI data should be compatible with the geo information Directive INSPIRE [EC 2007/2]. The first concepts from Austria and the Netherlands are confined to metadata. Both concepts place the emphasis on determining data quality. The Netherlands are, in addition, considering penalties for data providers (including private ones) if the minimum conditions for metadata are not met.

The current situation in Switzerland

In Switzerland, the Freedom of Information Act [Oeffentlichkeitsgesetz, SR 152.3] governs transparent access to public-sector data. Spatial information belonging to the authorities is made available under the Geoinformation Act GeoIG [SR 510.62] (http://geo.admin.ch), in a manner compatible with the INSPIRE Directive. The legal bases and the infrastructure are thus comparable to those of the EU.

FEDRO is establishing a system architecture (SA-CH), which can serve as a basis for a traffic data platform. Within this framework, the Integrated Applications (INA) project is to prepare a common data pool for traffic information, inter alia. Furthermore FEDRO captures journey times by means of anonymous mobile phone connection data.

Ideas for Swiss key projects

In order to collect initial experience on how data are provided and used, existing traffic or journey time information can be displayed on a website and simultaneously be made available in machine-readable form.

Switzerland will not be able to avoid creating a national access point for RTTI data, like the EU countries. Only in this way will it be possible in future to exchange traffic data with the surrounding countries. This access point can also be filled with data from the micro-transponders already proposed [Riederer 2013-1] [Riederer 2013-2]. Smartphones - like micro-transponders - can also collect appropriate data.

In order to implement the ITS Concept 2025/30 [ITS-CH 2012], Helveting has proposed a system for multimodal traffic information [Helveting 2014]. Its core is a data collection point from which data can be made further available, if necessary.

4 References

[EC REG 886/2013]: “COMMISSION DELEGATED REGULATION (EU) No 886/2013 of 15 May 2013 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users”, Official Journal of the European Union 18.9.2013, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:247:0006:0010:EN:PDF

[EC DIR 2010/40]: “DIRECTIVE 2010/40/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport”, Official Journal of the European Union, 6.8.2010, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0040&rid=2

[EU COM(2014) 642]: “REPORT OF THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL on the implementation of Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport", Brussels, 21.10.2014, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0642&rid=1

[EU SWD(2014) 319]: "COMMISSION STAFF WORKING DOCUMENT Analysis of Member States reports *Accompanying the document* Report from the Commission to the European Parliament and to the Council Implementation of Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport System in the field of road transport and for interfaces with other modes of transport", Brussels, 21.10.2014, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0319

[EU SWD(2014) 320]: "COMMISSION STAFF WORKING DOCUMENT Progress Report and review of the ITS Action plan *Accompanying the document* Report from the Commission to the European Parliament and to the Council Implementation of Directive 2010/40/EU of the European Parliament and of the Council of 7 July 2010 on the framework for the deployment of Intelligent Transport Systems in the field of road transport and for interfaces with other modes of transport", Brussels, 21.10.2014, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014SC0320

[EC REG 885/2013]: “COMMISSION DELEGATED REGULATION (EU) No 885/2013 of 15 May 2013 supplementing ITS Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of information services for safe and secure parking places for trucks and commercial vehicles”, Official Journal of the European Union 18.9.2013, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:247:0001:0005:EN:PDF

[Autos, heise. 2014]: „Vernetztes Auto: Telekom und China Mobile gründen Joint Venture“. *heise Autos*. Accessed on October 10, 2014. http://www.heise.de/autos/artikel/Vernetztes-Auto-Telekom-und-China-Mobile-gruenden-Joint-Venture-2415001.html

[EC DIR 2003/98]: “DIRECTIVE 2003/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 November 2003 on the re-use of public sector information”, Official Journal of the European Union L 345 dated 31.12.2003, p. 90, Amended by: "Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013", Official Journal of the European Union, L 175 dated 27.6.2013, p. 1, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02003L0098-20130717&qid=1416220922032&from=EN

[EC DIR 2007/2]: "DIRECTIVE 2007/2/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)”, Official Journal of the European Union L 108/1 of 25.4.2007, http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32007L0002&from=EN

[SR 152.3]: "Bundesgesetz über das Öffentlichkeitsprinzip der Verwaltung (Freedom of Information Act) of December 17, 2004 (status at August 19, 2014), http://www.admin.ch/bundesrecht

[SR 510.62]: "Bundesgesetz über Geoinformation (Geoinformation Act, GeoIG)" of October 5, 2007 (Status as at October 1, 2009), http://www.admin.ch/bundesrecht

[Riederer 2013-1]: Riederer, Markus: "Priority issue: Developments in neighbouring countries are a potential source of synergies; Cooperative Systems", its-ch, Bern, May 16 2013, http://www.its-ch.ch/fileadmin/redacteur/pdf/1._its-ch_16.05.2013__Engl-Schwerpunkt_International_01_def_ok_01.pdf

[Riederer 2013-2]: Riederer, Markus: " Priority topic: Developments in neighbouring countries offer potential for synergies; Open Data", its-ch, Bern, November 20, 2013, http://www.its-ch.ch/fileadmin/redacteur/pdf/1._its-ch__Schwerpunkt_International_2013-02_-Engl_def.pdf

[its-ch 2012]: " ITS-CH, Land Transport 2025 / 30 Concept, Summarised report", its-ch, Bern, December 2012, http://www.its-ch.ch/fileadmin/redacteur/pdf/Leitbild_ITS-CH_Landverkehr_2025_30_Kurzfassung_Web_ENG.pdf

[Helveting 2014]: Ghasparian, Hajmi; Egloff, Martin: "Beurteilung Leitbild Landverkehr 2025/30", Helveting, Hünenberg, 08.02.2014, http://www.its-ch.ch/fileadmin/redacteur/pdf/Publication_2014-02-08_ITS-CH_Helveting_Beurteilung_Leitbild_Landverkehr_2025_30.pdf

5 Abbreviations

BGÖ	Freedom of Information Act
C2C	Cooperative systems for car-to-car communication
C2I	Cooperative systems for car-to-infrastructure communication
C2X	Cooperative systems C2C and C2I
C-ITS	Cooperative Intelligent Transport Systems
eCall	Automatic in-vehicle emergency call using the 112 emergency number
EIC	European ITS Committee [EC DIR 2010/40]
EIP	European ITS Platform
ERTICO	European Road Transport Telematics Implementation Coordination Organisation
FOEN	Federal Office for the Environment
GeoIG	Geoinformation Act
HMI	Human-Machine Interface
INA	Integrated Applications
INSPIRE	Infrastructure for Spatial Information in the European Community
MTI	Minimum Traffic Information
PSI	Public Sector Information
RTTI	Real Time Traffic Information
SA-CH	System Architecture Switzerland
TEN-T	Trans-European Transport Network
TM2.0	Traffic Management 2.0
VMS	Variable Message Sign
XML	Extensible Markup Language