Issue 2/2010

mdv news

Information Technology from Munich

iPhone/Android Companion all the way to the MVV

DIVA and EFA in South West England

47th User Group in Günzburg

Dynamic Data Integration Platform (DDIP)

Letter from the Editor

Dear Reader,

Shortly before the beginning of the New Year we would like to keep you up-to-date on interesting happenings and news concerning our customers and our products with this new issue of mdv news.

In the last issue we presented a mobile journey planner in Karlsruhe and Luzern. This popular topic among software users is covered in depth in our lead article, which also describes our "Apps" that were successfully implemented for the MVV.

We are pleased to present a new internally-developed product in this issue. In order to organize and optimize the exchange of real-time data between AVM- and journey planning systems, we now provide a dynamic data integration platform, or DDIP. The DDIP communicates with satellite systems over standardized interfaces and is an entirely stand-alone system, but can be combined with DIVA and EFA.

As always, we report on our last user group, which took place in Günzburg, Germany. The major taking point centered on operational DIVA 4. After the presentations and discussions, user group participants were provided with the opportunity to watch the completion of 'hardware', or omnibuses, in city of Neu Ulm.

In addition to the four Traveline portals in England that use mdv software, we received a tender in June of 2010 for an additional system and were able to go live in South West England in September after only two months of processing time.

We are also pleased to report that we able to go live with another EFA installation in Australia, during the middle of the year in New South Wales (Sydney). We will be sure to report on it in a future issue of mdv news.

I wish you a relaxing holiday season and a successful new year

Dr. Hans-Joachim Mentz

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iPhone/Android Companion all the way to the MVV

When mdv began thinking about an iPhone application ("App") there were a few of them that already provided users some information about the public transport network. The choice at that time ranged from applications by hobby developers to contract work that was awarded to professional developer companies.

Indeed, we were not the first to recognize the importance of journey planning en route or realize the meaning of the iPhone (and shortly thereafter Android). This made it all the more important that we paid close attention to the market to seek out the various strengths and weaknesses of the existing Apps. Our basic principle was: "We are not the first, so let's take our time and do things right!"

In order to make a really good App, it does not suffice to just develop a bunch of functions and squeeze them into one App. This approach appeared to be used by the many Apps made by the competition, which leads to confusing interfaces that do not follow a clear concept. So to make our App intuitive and efficient we used the latest results from usability analysis as well as insight from the most well-known experts in the field. Our App should have a clear, user-friendly control concept and only contain the functions that are deemed necessary by our user groups.

A hot mulled wine at the Christmas market would be just right way to battle the cold. Let's check how we can get there fastest!

The First Steps

While the developers began to combine existing know-how and adapt the App for latest systems like the iPhone and Android in the background, the team was busy being occupied by all the other applications that had or have anything to do with journey planning and public transport. Again and again we found applications that were really well designed and were able to implement new ideas that were able to display helpful information or assist input. None of the Apps could satisfy all needs. In most cases, individual functions were innovative and helpful, but the entire interface concept was not user-friendly. In other cases, the concept was clear, but the selection of existing functions did not match user requirements.

We then began to think about our own concept, keeping in mind the best ideas from these reviews as well as our comprehensive experience with mobile Apps and websites. The most important question was: which people will use the App and how can we make most efficient, helpful information available to them? We quickly determined that the majority of our users would be so-called "regular passengers". And as any regular user of software knows, efficient use is more important the more frequently the software is used. A one-time user may not care if it takes 2 or 5 clicks to achieve their goal – but if they had to do this several times a day, it would mean annoying unnecessary steps. For this reason, our primary goal was to make control as user-friendly as possible for the regular user by reducing the number of clicks (or taps for touch screens) necessary to achieve their goal.

„…installed and impressed (…" by Ludwig Hüttner (September 30th, 2010)

In the Beginning was the Input

To start planning a journey, users always have to enter and select an origin or point of departure. The easiest method to have a user select a location would be to preselect it automatically. The Companion can do precisely that in an astonishingly efficient manner with the departure board: thanks to GPS, this feature displays the next departures in a user's immediate surroundings when the App is started, grouped according to stop, each with distance and direction. As a result, two realistic, frequent applications are covered: 1. "When are the next departures in my immediate surroundings?" and 2. "Which stops are within convenient walking distance?" The first case is used by many frequent-passengers, who already know which service they need to take but may need to check how much time they still have until the service departs their stop. The second case can be practical for passengers that are not familiar with their current surroundings. Everything listed above is taken care of by the Companion without a user having to make a choice or push a button.

The software user does have to be able to make some choices. Reading EFA usage statistics we were able to determine that stops were by far the most frequently selected origin or departure type. Based on feedback to other Apps we also knew that users prefer to enter addresses as well. Consequently, we did not want to limit our search to public transport stops, but also wanted to include a complete any-search. In order the make the any-search user-friendly, we added a match list that is displayed as soon as a user begins typing. Previous experience with various products has shown that this function is valued by users and

Figure 1: Departure board

helps them to find the desired location quickly. Using the iPhone and Android is similar in this respect, so that location selection can be made more efficiently than when using other input techniques (see Figure 2).

User Input is Holy

Additionally, we wanted to make our App helpful in situations in which users need to switch from tab to tab. Following the usability-principle "the user input is holy" we wanted to generally avoid having users have to make multiple inputs unless completely necessary. All previously entered inputs and selections are always carried over to the next screen. For instance, if a user is viewing the departures at stop "Church Square" and then switches to the journeys -tab, stop "Church Square" has already been preset as the origin. This is only one of many examples in the App in which our goal of a user-friendly and intuitive interface is apparent.

Figure 2: Suggestions while typing

Favorites Directly in Dialog Flow

In order to make the App more convenient for frequent users, we needed to put emphasis on using a "favorites" feature. Entering information into a text field with a match list is already user-friendly – but being able to select a location with only one click is even more convenient. Many of the competition's Apps only go halfway and provide favorites for locations as a separate tab or using additional buttons that have to be explicitly selected. Our goal was to integrate the favorites more intuitively and, in doing so, both shorten and simplify the entire journey planning process. The designed solution is as follows: based on the context we try to anticipate what a user wants to do next. Instead of supplying empty fields we try to suggest potential matches. In the departures-tab either the last-used or saved locations are displayed, and can be set as a point of departure with one click. The App also "remembers" if the user had previously used the last-used or saved locations and provides them with a corresponding list. Similarly, a list of the last-used or saved journeys is displayed in the journeys-tab, which can be used to directly plan a new journey. If a user indicates that they would like to enter an origin or destination (by clicking in the corresponding text field), the last-used or saved locations are automatically displayed. As a consequence, the favorites are also elegantly integrated into the dialog flow for input of origin and destination in the journeys-tab without losing the journey-favorites.

"Excellent. You can easily find the pub transport nearby. Very useful for visitors" by Tao (October 6th, 2010)

Figure 3: Map

Fully Integrated Map

Every modern timetable application should have an interactive map. Although this feature is not regularly used by all passengers (according to feedback), it is often helpful for orientation and visualization of routes (primarily for interchanges). Integration of maps and network maps was in need of improvement for most of the Apps we looked at: either only standard maps were used (mostly Google Maps) or there was no interactive map at all. In contrast, our concept was to have the map play an important role from the beginning – for visualization, orientation and input purposes. Because many of our customers already provide interactive maps on their websites, it was obvious that we wanted to display them directly on the iPhone and in Android. By integrating existing resources, no additional effort was necessary from our customers when introducing the App. The map is displayed exactly as specified by the customer (see Figure 3). We proceeded similarly with the network maps: customers with existing interactive network maps did not to need to worry about any additional effort required (see Figure 4).

„Much better that the website. Well done" by Christian Breuer (October 7th, 2010)

Selection of origin and destination should be possible on both the network map and the interactive map. Only individual stops can be selected on the network map, whereas any location can be selected on the interactive map, including stops and addresses. Planned journeys are also displayed on the interactive map. This feature enables route visualization and, with GPS positioning, a comparison to one's own location along the route.

Similar to the favorites, we wanted to fully embed the map into the dialog flow instead of offering it as an additional tab. This makes it possible to click in the journey results screen on a stop or other location and have the map "jump" to this point. Even if a user switches to the map using the tab-bar, the previously planned journey will still be displayed. In addition to displaying the journey route, all interchange points include additional information. In this way, users need only to read the map to find out when and into which service they should board. We did not implement a simple map, but rather one with a number of meaningful details in an enriched display, which helps users through intelligent integration into the remaining dialogs.

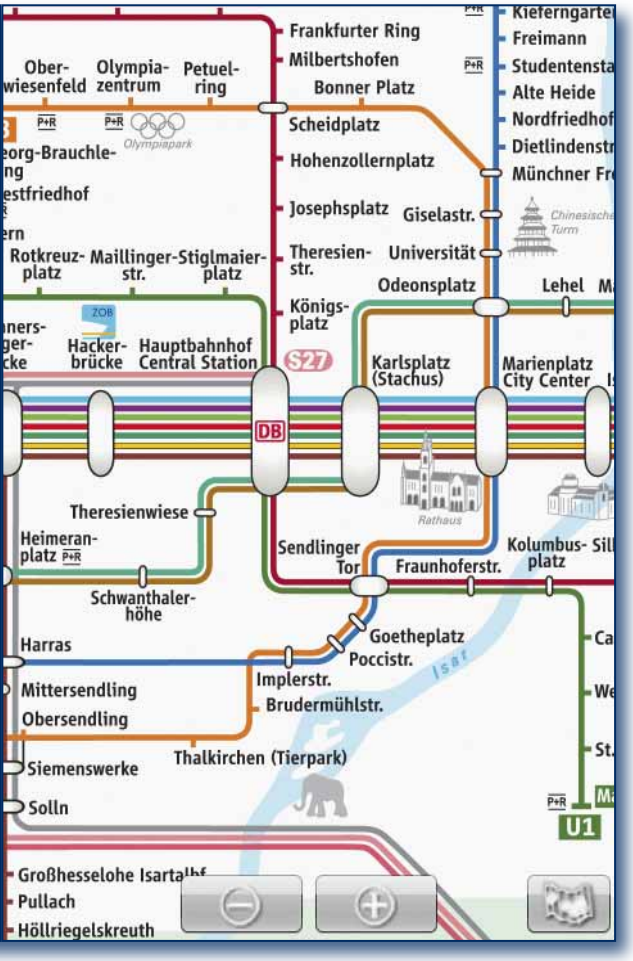

Figure 4: Networkmap

New Display Forms

A further area of improvement compared to other Apps is the display of journey results. Most Apps on the market still use a variant of the classic display of journey results, which essentially refers to the following hierarchy "journeys, journey, leg, origin+destination+service", which in turn was derived from the used data structures and algorithms. This display form represents the standard, but we wanted to consider if this was the best form from the user's perspective.

In order to find the best display form, we searched in other, neighboring sectors. Of all places, we found our answer by public transport's classic competitor, the automobile. Car navigation systems face the same problem as public transport: they have to present an entire journey in a form that is also intelligible for the driver during the journey. And because journey planning on a mobile is primary done just before or during a journey, we wanted to use this comparison to improve our own display.

As a result of these considerations, journeys are now displayed very differently in the Companion than before. Taking the place of the hierarchy, the Companion now displays journey details in small bits called "events". Each event represents a (partial) leg of the journey in which a passenger must do something, which could be any of the following actions: board a vehicle, alight, walk to a location, remain seated, etc.
This form of display has major advantages for use during a journey. Similar to a driver using a navigation system in a car, a public transport passenger's use starts to become more interesting the moment they start their journey and need to plan what they will do next. It can also be used for top notch passenger information because it is goal-oriented. As demonstrated at the User Group in the spring, the display can be easily enhanced for future functions.

Small Details

A large number of customer reviews indicated that they would like to have fares displayed. Interestingly, there were very few, and still are rather few Apps that do this – all the more reason for us to at least partially introduce displaying fares. However in order to avoid showing too much unnecessary information on the layout we only display the fares for single journeys in the current version – with the option to enhance the feature at a later date. User feedback has been overwhelmingly positive – many users see the display as one of the biggest draws of the MVV Companion. This is one area that we will continue to develop in the future.

From Concept to Delivery at MVV

At the time of the User Group in the spring of 2010 the Apps for the iPhone and Android were already in the testing phase. At the conference, we presented a few concepts that we wanted to use and why we wanted to use them. Much has changed in the meantime. Working with the MVV, we tried to bring the first version of the Apps to the market. A variety of usability-tests both internal and external made sure that the concepts were increasingly well-designed and the usability more user-friendly. A few incremental updates were able to respond to user feedback and improve the Apps even further.

„If you use public transport in Munich this App is a must (…)" by SoulShine (September 26th, 2010)

At the same time we built a framework that made it possible to create a completely new iPhone or Android App in considerably less time. Consequently we could reduce development time from a few months to only a few weeks – a big advantage for customers that want to have a completely redesigned App.

The MVV presented us with the opportunity to introduce our concepts and ideas with the MVV Companion to a large user group, and for this we are very appreciative. In contrast to many Apps that are currently available, our Apps are constantly being enhanced and developed. In particular, contract work usually suffers from development stop after the contract has been fulfilled, even though known issues exist. Yet we want to continue development on the MVV Companion and our other Apps and adapt them to the needs of users.

In addition to required fixes, we are constantly working on new, exciting functions and we continue to precisely monitor user feedback and take their comments seriously. We have responded within a short amount of time in multiple instances, which has been very well-received. Our position as a supplier of EFA and Apps in one makes it possible for us to introduce new functions more quickly and use them more efficiently. As an example, the MVV provided journey planning on the iPhone and in Android directly to a tent during the Oktoberfest. We will be sure to play off this advantage in the future.

"Super App!" by Dominik (September 20th, 2010)

Conclusion

On the previous few pages we have presented several objectives and ideas that have found use during the development of our iPhone and Android App. MVV users have already been able to experience the App in live operation. However this article cannot touch on all aspects and cover every small detail that we concentrated on during conception, development, implementation and future enhancement. So the best way to learn about all the details is to try out the App on your own mobile device.

We were not the first to bring our Apps for the iPhone and Android onto the market. Yet we took our time and created an App with a coherent concept and many helpful details that rises above the competition. Go on, give it a go and see for yourself!

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References:
The iPhone/Android Companion can currently be used by passengers in the following areas:

- MVV, Münchner Verkehrs- und Tarifverbund (Munich, Germany)
- NVBW, Nahverkehrsgesellschaft Baden-Württemberg (Federal State of Baden-Württemburg)
- VBL, Verkehrsbetriebe Luzern (Lucerne, Switzerland)
- NSWTI, New South Wales Transport Info (Australia)
- VRN, Verkehrsverbund Rhein-Neckar (Rhine Neckar Region, Germany)

Each customer has a customized version that has been specifically tailored to their region.

First Experiences ....

Mr. Alois Mühl, responsible for the implementation of Companion at the MVV, took time to answer a few mdv questions about the first experiences of the process.

The MVV is in mdv's backyard and is also the first authority that made the Companion available to their passengers. Where do you see the advantages of the MVV Companion?
One big advantage of the MVV Companion is that it is almost identical in function and content (most notably our map material) to the EFA in the internet. Especially because EFA is used over a million times each month to plan journeys, which makes usability even easier. For instance the commuter train network map can be used for route selection. Another big advantage is the display of incidents in an overview. The Companion excels in its remarkable stability on iPhone and Android mobiles / smart phones. We had a no-frills approach to development and implementation, which led to more efficient usability and speed.

How was the MVV Companion received by passengers?
I will let the numbers speak for themselves (downloads and planned journeys). Without having started an advertising campaign, we were able to reach user numbers in the first few weeks that were far above what we had expected. I think we recognized the "Zeitgeist" and were able to move on it. Passengers responded very positively with a lot a positive feedback and had a number of interesting suggestions for the future.

How do you see the Companion's future development?
First, one has to see the development with real-time. There is a lot of potential in this segment for practical customer use. The "Guardian Angel" function (monitored pers. routing) is one of many examples that could be implemented on this basis.
Under the current "APP fever" some manufacturers of mobile devices have begun to gear their APP – approach towards their own operating system. In doing so the uniformity that was originally considered has now been ruined. If this trend continues, I see the mid- to long-term general solution heading towards a mobile browser-based version of mobile passenger information for the public transport network. However, the system must be optimized better for a passenger, which would include approaches to individual customization. Future browser generations will have potential that can also contribute to potential solutions.
But we have to jump on this train now so we are not left behind …

Personally, what is your favorite feature of the MVV Companion?
I do not really have one individual favorite feature. I think the entire APP is a success. The design and the App's user-friendliness are especially successful. Additionally I enjoy the speed with which this App calculates journeys or the maps or even how the routes are displayed. Simply awesome.

Mr. Mühl, thank you for the interview

Dynamic Data Integration Platform (DDIP): Our Central Data Platform for Real-time data

Real-time in Public Transport

Real-time information like delays or incident messages is used by larger transport operators and authorities to improve the quality and desirability of public transport. The data is generated by so-called "Automated Vehicle Monitoring Systems" (AVM) based on regular vehicle location messages.

Through a combination of a vehicles' real-time data and a data exchange between the acting operator and the transport authority, connections can be greatly improved at interchange points. Data may be displayed to passengers in the vehicles themselves and/or at important interchanges on station displays (see figure 1).

Figure 1: Station display in Munich

Not only can real-time capable journey planning systems like EFA by mdv display information about incidents (see figure 2), but they can also take this data into account for routing calculations so that passengers are automatically redirected if any type of incident occurs along the intended route.

Zeit	Verkehrsmittel	Linie	Richtung
10:48	Zug	RE13	Venlo Station
!	**2 Minuten später** Abfahrt 10:50 **Hinweis:** Fahrradmitnahme begrenzt möglich		
10:50	Zug	IC 2013 Allgäu	Ulm Hauptbahnhof
!	**5 Minuten später** Abfahrt 10:55 **Hinweis:** Fahrradmitnahme reservierungspflichtig Fahrradmitnahme begrenzt möglich Bordbistro		
10:53	Zug	ICE 547 InterCityExpress	Berlin Ostbahnhof
!	**2 Minuten später** Abfahrt 10:55 **Hinweis:** Bordrestaurant		

Figure 2: EFA Journey Planner with real-time (VRR)

Data Exchange over Standard Interfaces using a Subscription Procedure

For the data exchange, the AVM-system processes the location data of the vehicles in accordance with standard interfaces (e.g. VDV453/454 or SIRI interfaces) and forwards it to AVM-systems of neighboring transport companies and/or to journey planning systems. The real-time data are mostly exchanged using a subscription procedure; this means the recipient orders information about particular services over a certain time period, connection calculation etc., and is constantly informed by the supplier, when new data can be retrieved.

The configuration of communication connections between the AVM and journey planning systems is generally quite extensive, especially when a number of systems are connected to one another (see figure 3). For example, if the master data of one AVM systems changes, the corresponding settings have to be updated for all communica-tion partners.

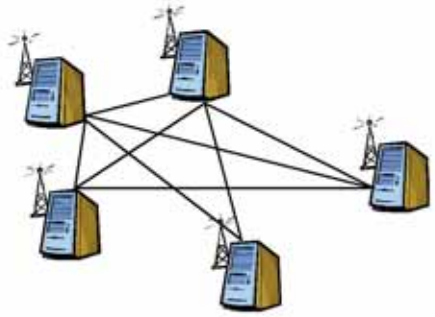

Figure 3: AVM-systems and communications channels

Central Data Platform DDIP

This unnecessary complexity calls for the introduction of a central data platform which is connected to all satellite systems (AVM-systems and Journey Planning Systems). All communication of the satellite systems solely occurs via the data platform (see figure 4).

This kind of platform is represented by the mdv-system Dynamic Data Integration Platform (DDIP).

DDIP is a completely stand-alone, self-contained system compared to the rest of the mdv product family (DIVA, EFA, etc.), and only communicates over standard real-time interfaces with satellite systems.

Components

The DDIP system consists of three components (see figure 5):

- The DDIP agents constitute the core components of the system. They carry out the setup, acceptance and management of real-time data subscription as well as the reception, storage, and relaying of the data.
- The DDIP database contains the master data of the data supplier, subscription data, temporarily stored real-time data and log data for monitoring and analysis
- The DDIP system can be configured using the DDIP web layout, which also provides comprehensive monitoring, logging and analysis functionality

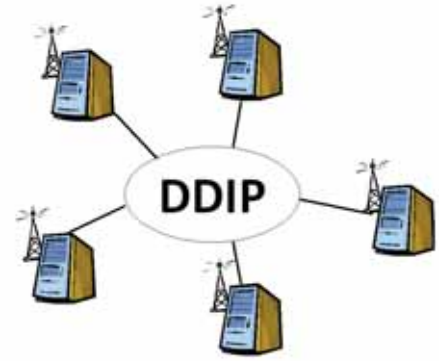

Figure 4: AVM-systems with DDIP

System Stability & Load Balancing

A failure of the core components would mean that the communication of all connected satellite systems has also been interrupted. As a precaution, emphasis was put on the development of core components to ensure both maximum stability and effective load balancing.

The core components can be started re-dundantly on one or more servers. Requests can be distributed using a load balancing procedure to the various entities. If an entity is cancelled, the remaining entities assume entire work. Even the DDIP database can be converted redundantly using a replication procedure to distribute the incoming load and/or to achieve system stability.

Performance & Resource Consumption

The information value of a real-time message diminishes rapidly over a short amount of time. So using a central data platform, over which all messages flow, is only practical when no major delays occur while relaying information. Beside system stability, the per-formance of the core components is critical. Depending on the model (with or without temporarily storing the data), the core components can receive, pro-

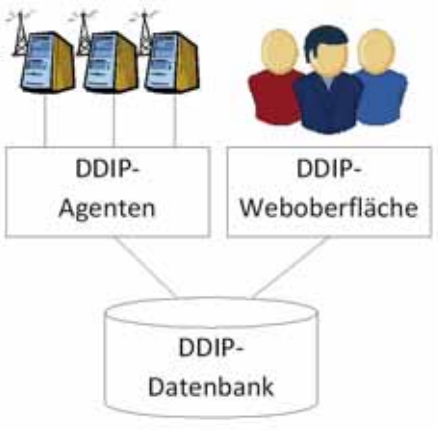

Figure 5: Components of the DDIP-system

cess and relay approx. 600 messages per second. At the same time, the DDIP is multi-threading-capable, simultaneous requests and other incoming work can be processed and responded to in parallel from multiple satellite systems.

The core component was developed with .Net and runs as a Windows service depending on the operating system with 32 or 64 bits so that the applied resources can be optimally used. The resource consumption of DDIP agents is very low, even state-wide data platforms like the DDIP for DEFAS FGI BAYERN run smoothly in virtual environments with virtualized CPUs.

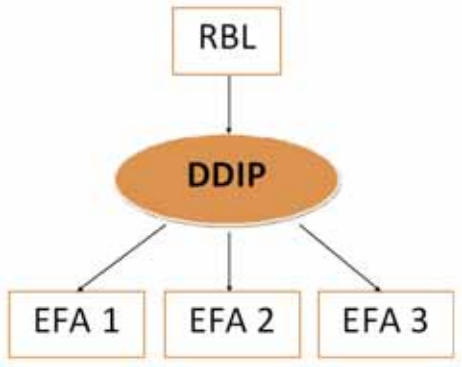

Figure 6: Three redundantly designed EFA-systems are supplied via DDIP

Advantages of Using a DDIP

In addition to the previously mentioned simplification of topology, the associated minimization of confi-guration complexity during setup and the updating of communication connections, our data platform provides further advantages:

- **Converting Formats and Interface Versions**
  DDIP enables communication between satellite systems that implement different format versions of an interface and automatically converts the format versions. Even conversion between different formats is also possible as long as the necessary data contents exist.

- **Multiplexing to Data Recipients**
  DDIP enables multiple data recipients, to subscribe to the same real-time data of a supplier (see figure 6). This is especially interesting when the data recipient is redundantly designed (for safeguarding) and has to be supplied with the same data - multiple setup of the same subscription is not possible on licensing or resource-technical grounds. DDIP bunches the subscriptions and supplies them with temporarily stored real-time data that they ordered over a single subscription from the data supplier.

- **Multiplexing to Data Suppliers**
  In multiplex mode, it is possible to bundle subscriptions for multiple data suppliers into a consolidated subscription (see figure 7). Data recipients can thus order data from multiple suppliers using a single DDIP subscription. This, in turn, simplifies the configuration for data recipients.

- **Central Status Monitoring**
  The DDIP places status requests to all satellite systems in regular intervals. In this way, an outage of a satellite system can be quickly recognized and reported (see figure 8).

- **Central Monitoring, Central Error Analysis**
  DDIP provides a web layout that enables monitoring and analysis of the dataflows of all connected satellite systems (see figure 9).

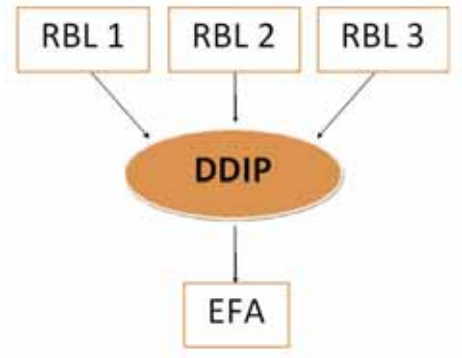

Figure 7: EFA-System receives data from multiple AVM-systems via a single subscription

Special analysis functions (for example to check the consistency between target and actual data) plus a test of the connected satellite systems help analyze the causes of errors.

Projects

In March of 2010 our data platform came into operation for the first time for the DEFAS FGI BAYERN project of the Bavarian Railway Company (BEG). In the previous stage of expansion real-time data was exchanged between seven satellite systems. In the next phase of the project the number of connections is slated to be expanded to other AVM systems across the entire Federal State of Bavaria.

Additional operational DDIP installations are the Transport Authority of Vogtland (since 3/2010) and the Stuttgart Transit and Tariff Association (since 9/2010). Currently, the first satellite systems are being connected to the platform at the Transport Authority of Bremen and Lower Saxony and Suffolk (UK), which will represent the first DDIP installation outside of Germany.

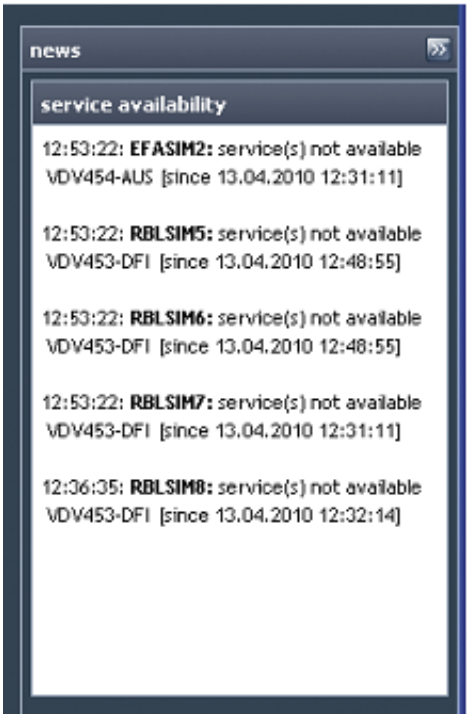

Figure 8: Satellite system outages is displayed prominently on the DDIP web screen

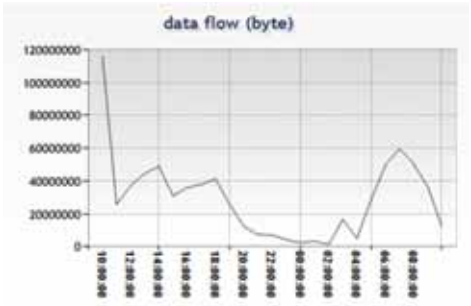

Figure 9: Sample graphic of the DDIP-web layout: data-flow beyond a day

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47th DIVA User Group in Günzburg

The 47th DIVA User Group took place on the 6-7 October 2010 in Günzburg, Germany, in Bavarian Swabia. The conference was hosted by OMNIPART Verkehrsdienstleistungen GmbH & Co. KG from Krumbach. The 'Forum am Hofgarten' in Günzburg served as the venue, providing both architectural appeal and excellent technology.

Mr. Brandner, an OMINPART associate, welcomed participants to the UG. The city of Günzburg, represented by Mr. Stammer, also welcomed all guests in attendance.

The main themes of the UG were from operational planning. First, the status of the current DIVA 4 installations was given: at present there are already 6 installations in productive operation, 12 customers are currently in a 'migration phase' and a number of additional installations have already been ordered. DIVA 4 is being well-received by its users. Several of the other presentations dealt with current developments, e.g. managing route options interactively on a map. The first user of operator DIVA 4 will be the Emirate Abu Dhabi, where geographic referencing is of particular importance.

One large topic was web-based timetable management. In the future, operators (the target groups are small and medium-sized users) can create timetables using a web browser, with a range of functions that previously required a desktop module. In this way, cumbersome and complicated program installation can be avoided. All data are in one database on a central server.

DIVA 4 also contains a module for asset management far beyond any previous options. It provides a way to keep track of and manage public transport stops themselves - their shelters, any existing display cases, their equipment - as well as presentation products like timetables, area maps, fare information, advertisements etc.

Ms. Sonnenmoser, from the Stuttgart Strassenbahn AG (SSB), reported on the semi-regional duty schedule optimization in the operational duty schedule.

A new product is the Duty-Terminal for drivers. This product allows drivers to access their duties in a dialog and enter their requests. In addition to the terminal, the information is also available over the internet.

Christoph Mentz presented a new mdv product called AVM-Light. The Transport Association of Vogtland commissioned the creation and development of the product. An AVM-Light by mdv does not need an on-board computer. Instead, a vehicle only requires a standard GPS tracker which transmits positioning. Communication with the driver occurs by mobile phone supplied by the network provider. Mdv provides the control center.

New EFA developments were also presented, e.g. a modern standard layout with one-field search and map technology.

Intense discussions and exchanges of experience followed during the breaks.

During the evening participants were given the opportunity to observe the assembly of omnibuses at EvoBus Setra in Neu Ulm. Participants then attended a gala dinner, also in the Forum, and later in the evening were able to laugh at the whimsical mockery of the 'Weibbilder'. Oddly enough, they were well-informed about the both the host and mdv.

mdv participates in Research Project IP-KOM-ÖV

With the scope of research project IP-KOM-ÖV (internet protocol-based communication services in public transport) a large consortium has taken on the task of revising existing standards for data and information exchange in public transport and – where necessary – creating newer, more up-to-date standards. The Federal Ministry of Economics and Technology has recently given the consortium a green light to release funding for the project, which TÜV Rheinland was commissioned to award. The project is headed by the Association of German Transport Companies (VDV). Participating transport companies are the Deutsche Bahn (German Railways), the Essen Verkehrs-AG, the üstra Hannoversche Verkehrsbetriebe and the Stuttgart Straßenbahnen AG. Other participants from industry include: Annax, HaCon, INIT, IVU, mdv und Scheidt & Bachmann. In addition, the Technical Universities of Darmstadt and Ilmenau, as well as the University of Stuttgart will all be involved in the project.

The project work, which will begin in December 2010, is divided into four large sectors that are abbreviated as "AK". AK 1 deals with the communication between vehicle on-board units. AK 2 involves data interfaces of customer devices either directly to vehicles or to so-called real-time-communication and JP platforms (EKAP), which serve as an interface for all timetable data and current information. From these interfaces a customer can personally access real-time information related to their specific needs and, in doing so, check the status of a planned journey or find a potential alternative in the event of an incident along their planned route. To make this a reality, AK 3 is analyzing operations in AVM and ITCS systems (AVM: Automated Vehicle Monitoring Systems, ITCS: Intermodal Transport Control Systems) as well as in the interfaces between these systems and the EKAPs. AK 4 will then take the developed processes and interfaces and put them to a field test.

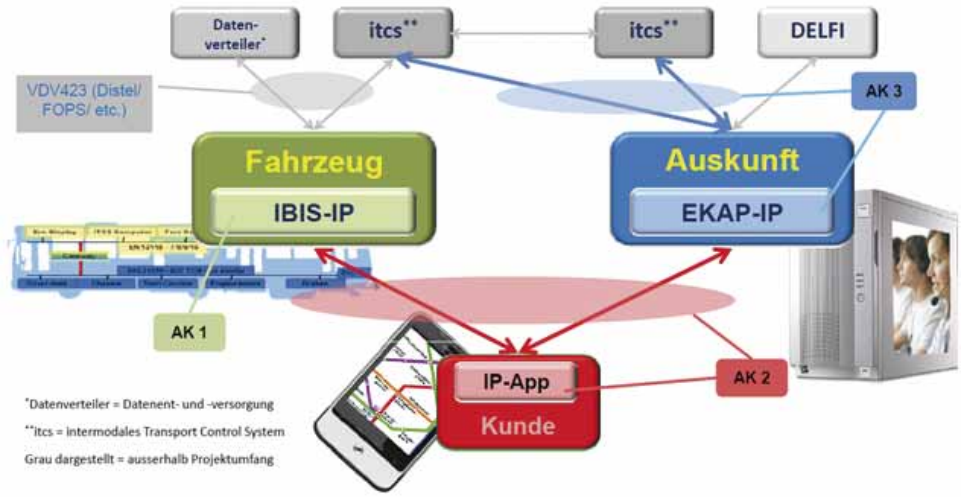

Figure 1: Source: Association of German Transport Companies (VDV).

mdv has taken on project leadership of AK 3, and will be sure to rely on experience from standardization processes with the VDV and the European Committee for Standardization (CEN) as well as draw on knowledge from setup and operation of real-time capable journey planning systems.

In a three-and-a-half year period, project IP-KOM-ÖV will establish a basis for customized, real-time capable services that will especially benefit passengers en route to their destination. As a consequence, special consideration is taken with regard to the needs of non-native-speaking and disabled passengers when using public transport and journey planning systems.

European Standard for Exchange of Timetable Data in Progress

In the past few years mdv has collaborated on the creation European standards, e.g. for stop modeling (IFOPT – Identification of Fixed Objects in Public Transport; www.ifopt.org.uk) or for the exchange of real-time- and forecast data of public transport (SIRI – Service Interface for Real-time Information relating to public transport operations; www.siri.org.uk; cf. mdv news I/2008). Since the beginning of 2009, another important area has been addressed by a working group of the European Committee for Standardization (CEN; www.cen.eu): the exchange of scheduled timetable data. Under the acronym NeTEx (Network and Timetable Exchange) experts from Germany, Great Britain, France, Switzerland, Netherlands, Hungary and Sweden are working on a new and modern timetable specification, which will most likely become the long-term successor of the widespread VDV 452 interface. mdv is also an active member of this working group, especially when developing applications and the data model.

The creation of new European Standard is divided into three phases that will be addressed between 2009 and 2011. In the first phase (2009) a common model for network topology (stops, routes, route options, etc.) was developed. The basis for the modeling of object types and hierarchies is the European Standard TRANSMODEL (www.transmodel.org). Since the beginning of 2010, phase 2 has been working on an exchange interface for timetables – and that being for both operation use and passenger information. This phase will be completed in the spring of 2011. The final phase 3 will standardize the exchange of fare information.

This ambitious endeavor is a technical challenge and will certainly have long-term influence on and inspire the development of telematics applications in Europe in the near future. We will be sure to report on the continuing progress of this work …

DIVA and EFA in South West England

The Southwest of England is one of the nine administrative regions of England. The other regions include Greater London, South East England, West Midlands, North West England, North East England, Yorkshire and the Humber, East Midlands and East of England. With a total population of 5 million and an area of approx. 24,000 km2, South West represents the largest region in England in terms of area. In addition to the world-famous Ceremonial County and Unitary District Cornwall there are many other renowned cities and towns in Southwest England. The many famous sites include Stonehenge - a preserved structure out of concentric circles from the Neolithic period - , the Jurassic Coast an impressive coastal formation and UNESCO World Heritage Site - , Weymouth 1212 Olympic venue for sailing competitions.

Figure 1: Homepage South West

The administrative seat of South West is in Plymouth, which is also home to SWPTI Ltd. SWPTI Ltd. stands for South West Public Transport Information Limited and is responsible for operating the Regional Traveline Portal. Traveline South West http://www.travelinesw.com is one of 12 Traveline regions in England with a mandate to provide complete, barrier-free access to public transport information. In essence, the administrative regions correspond to the Traveline regions. The remaining Traveline Regions in Great Britain (UK) are Scotland, Wales/ Cymru and Northern Ireland. The official Traveline Portal, which contains information about the idea and the individual regional Traveline portals in the UK, can be found at the following address: http://www.traveline.org.uk/.

Of the existing regional Traveline portals, five are now operated with mdv Software:

- Traveline South West, http://www.travelinesw.com
- Traveline East Midlands, http://www.travelineeastmidlands.co.uk
- Traveline East Anglia, http://www.travelineeastanglia.org.uk
- Traveline South East, http://www.travelinesoutheast.org.uk
- Transport for London, http://journeyplanner.tfl.gov.uk

Hence the entire south of England is organized with DIVA and EFA software.

In June 2010 SWPTI Ltd. decided to adopt DIVA (version 4) and EFA to operate Traveline South West and supply it with the most-up-to-date data. The system was operational after only 2 months of intensive lead time and went online on the 27 September 2010.

The new Traveline South West design is based on the newest guidelines of the National Traveline Portal, which was updated at nearly the same time. Besides journey planning functionality, other features include interactive map functionality, html- and pdf-based timetable displays, SMS code stop search for mobile services and a contact details search for regional bus operators.

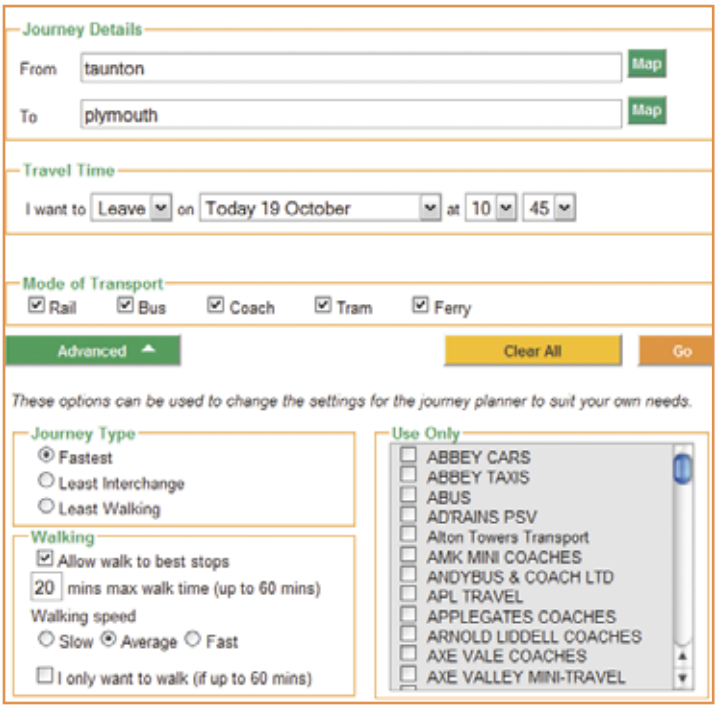

Figure 2

The journey planning on the site is based on the error-tolerant one-field-search of the EFA system (see Figure 1), extends across all modes of transport and provides for the selection of additional options.

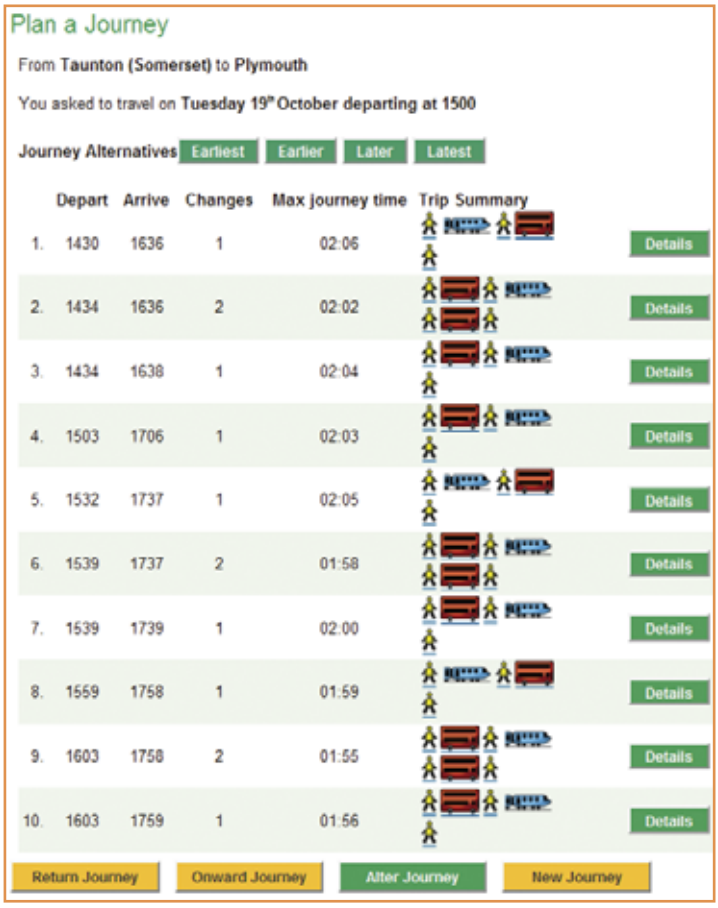

Figure 3

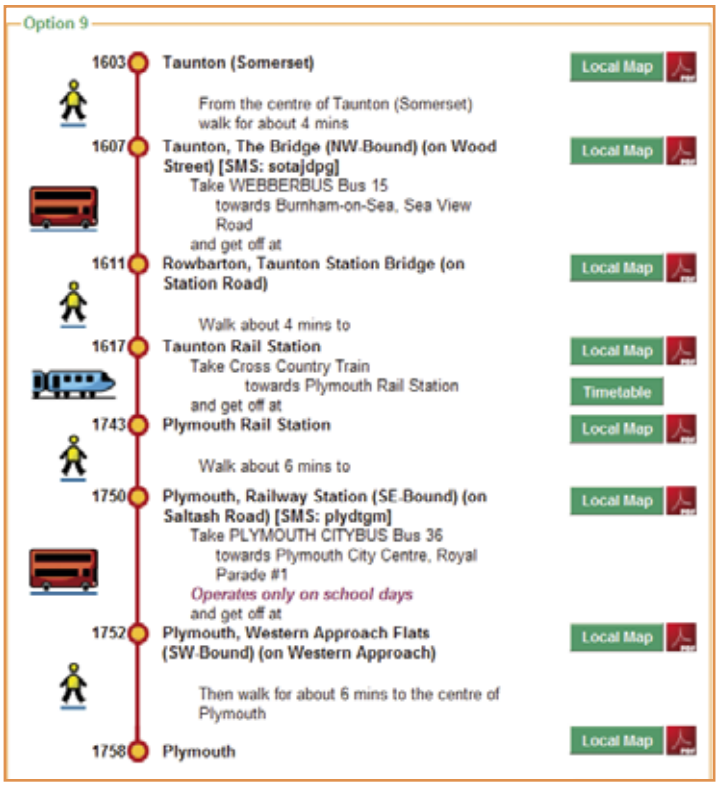

Figure 4

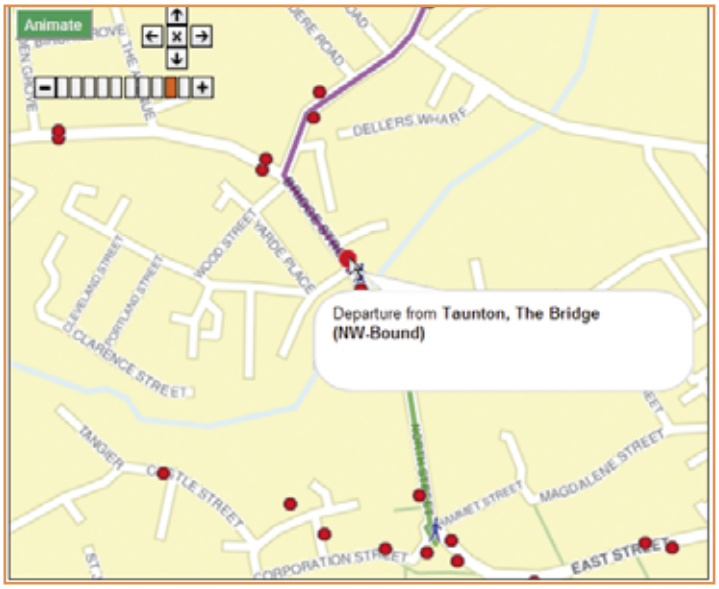

Figure 5

Planned journeys are displayed as an overview that includes journey times, interchanges, modes of transport and walking times (see Figure 3.

The journey details not only contain the options chosen in the overview, but also details about the operators involved in the journey, exact interchange times, SMS codes of the stop points and links to journey-specific maps and timetables (see Figure 4).

The interactive map functionality is based on map tiles (256 x 256 pixels) which are available for the entire South West region in 10 zoom levels. Journey-specific information is also displayed as a feature of the map (see Figure 5).

Maps are also available in printer-friendly PDF format to serve as a reference during the ride (see Figure 6).In order to provide timetable displays in EFA, DIVA4 has implemented the following two possibilities: (1) request

Figure 6

In order to provide timetable displays in EFA, DIVA4 has implemented the following two possibilities: (1) request sent from EFA directly to the DIVA4 database or (2) preparation of the timetable data into a special format, which EFA processes on request. Traveline South West decided to go with the latter. The specially prepared format can generate both HTML- and PDF timetable displays. A search is performed using either a route number/-name or a stop (see Figure 7).

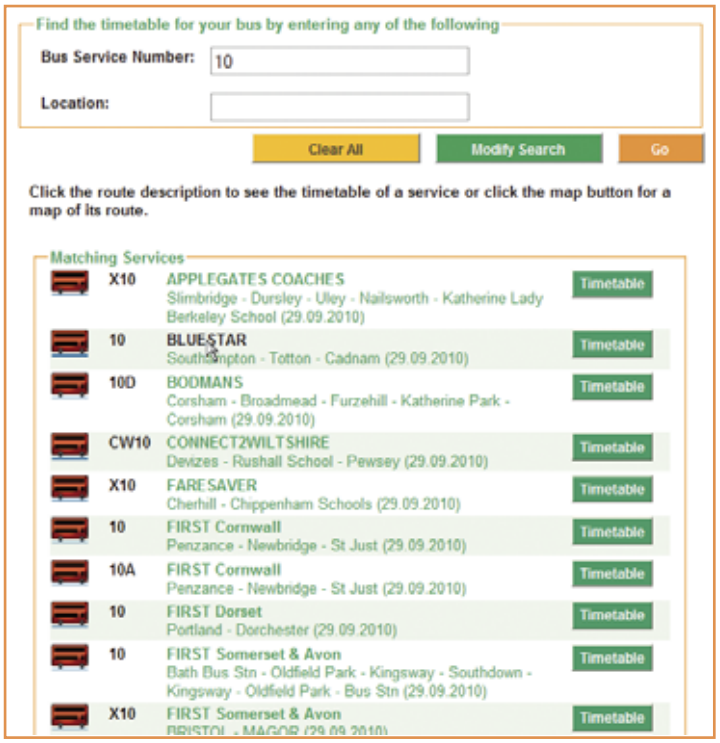

Figure 7

The advantage of the HTML-display is that trips can be found quickly. The PDF-display, however, can be printed out and hung up (see Figure 8).

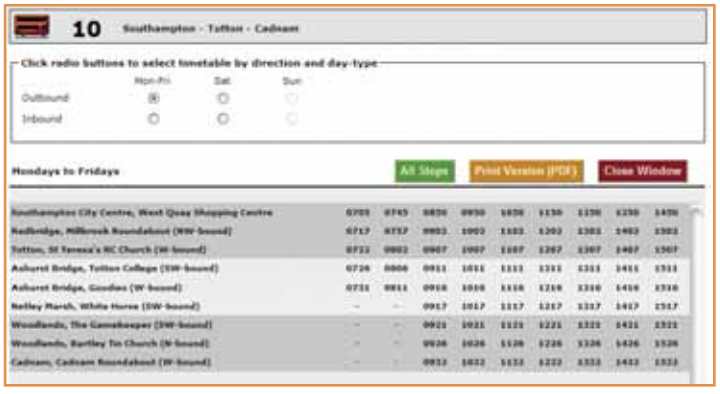

Figure 8

In addition to the standard EFA installation functionality, there are more advanced functions, like locating SMS codes to forward to mobile services. Users can either search using the route number/-name or a particular stop to receive a list a list of the corresponding SMS codes (stop code see Figure 9).

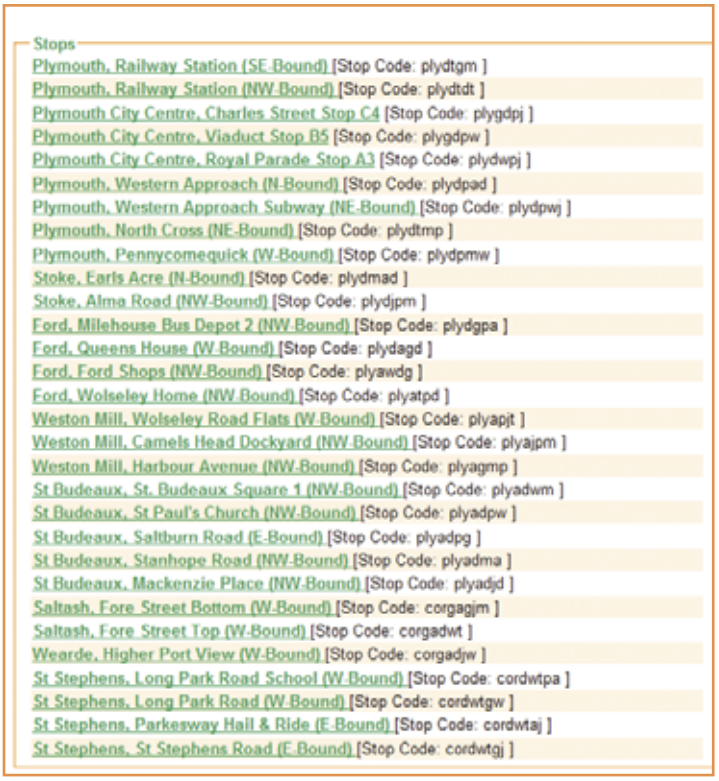

Figure 9

The codes can also be displayed on the interactive maps in order to provide a better overview regarding the geographic placement of the stop point (see Figure 10).

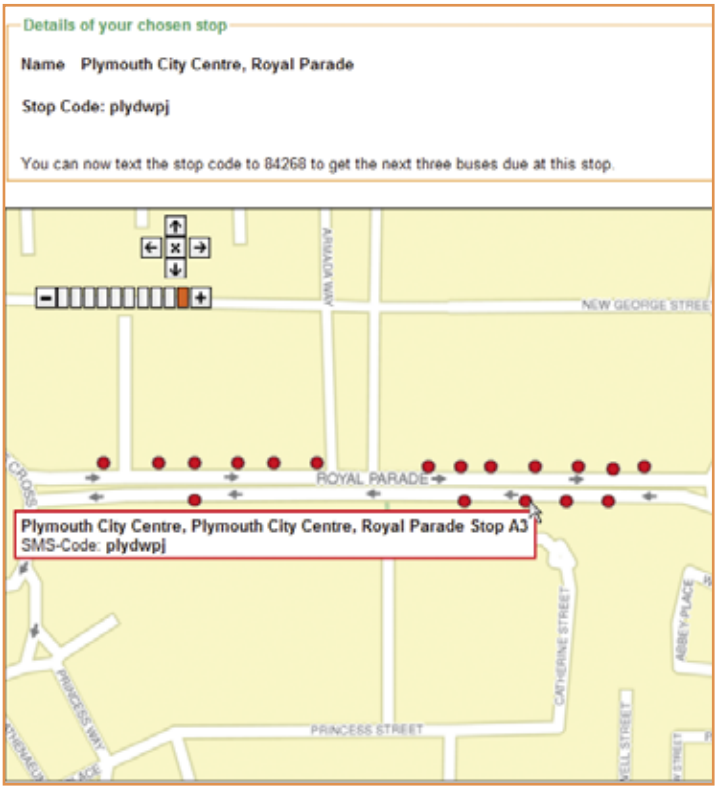

Figure 10

Figure 11

Additionally, Traveline South West provides a contact details search for regional bus operators so that site users can find out about possible fares directly from the source. This search was implemented for operator names (see Figure 11).

Data management is carried out in DIVA version 4. SWPTI LTD. uses the system to manage stops, which are passed on to the National Ministry of Transport in line with the NaPTAN data transfer, as well as to manually enter timetable data and to import local and regional bus operator data into Atco.cif and TransXChange. Using special data exports – also into Atco.cif and TransXChange - AVM systems are supplied with timetable data from DIVA4 (see Figure 12).

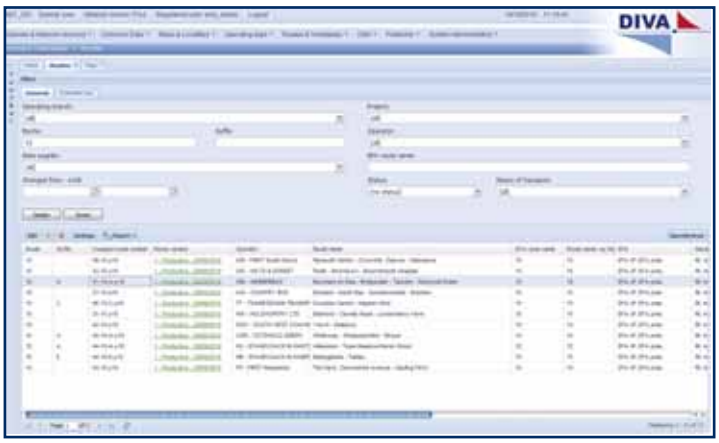

Figure 12

SWPTI Ltd. is currently working with the full range of DivaWeb functionality, especially the map-based views, and Diva Schedule for timetable planning (see Figure 13).

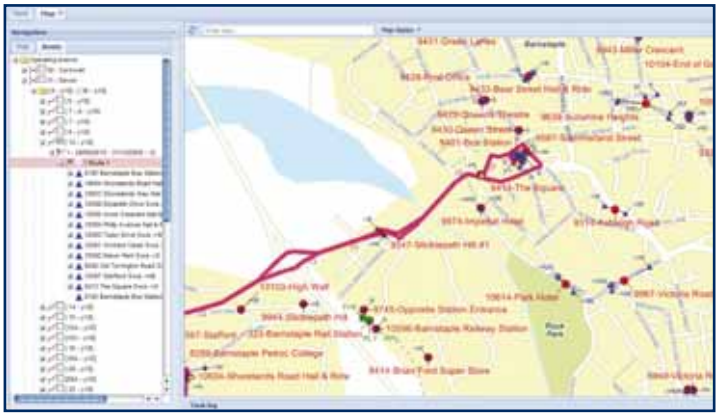

Figure 13

The DMS (Data Management System) in DivaWeb helps the SWPTI data managers organize and prepare the data for the journey planner (EFA).

During the next few months, the SWPTI Diva4 installation will be upgraded to include timetable planning in DivaWeb, and in addition, the Electronic Bus Service Registration (EBSR) will be activated for local and regional routes.

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Tel.: +49 (0) 89 418 68-133

Julie Williams is „Programme Development Manager" at SWPTI and responsible for Traveline South West (TLSW). Beside this she takes responsibility on national projects for the Traveline UK.

How can people profit from using the new web portal for Traveline South West?
People can use our website to see the choices of travel offered to them by public transport. The site searches all times and routes for all modes of public transport in the region to find a list of possible journey options for your chosen journey, from door to door. It is complete and impartial and displays journeys in a simple and accessible way. It is the only single regional source for this information and forms part of a national service.

What has the feedback been like for the new portal?
Customers like the clean look of the site, and as well as the layout favourite features are being able to download pdf timetables, and see travel options throughout the week rather than just the day of travel

Are there any further plans to enhance the website?
We will be adding bus fares to the site in the next year. We will also integrate Real time information from systems around the region, and add details of non-scheduled disruption to travel

News in Brief

DIVA in Beatles' Town

mdv was able to successfully win an international bid for the operation of a web-based scheduling system in Liverpool. Merseytravel (http://www.merseytravel.gov.uk/) will depend on DIVA4 with its user-specific enhancements. The operator of more than 6000 stops monitors and coordinates the activity of more than 180 million productive trips per year. In addition to the management of timetable data and the processing and editing of all print products, Merseytravel also operates several customer centers.
mdv is proud to have this new customer on board and is looking forward to close collaboration with them.

Autonomous Province South Tyrol chooses DIVA 4 and EFA

Within the framework of a tender, the autonomous Province South Tyrol (German: Bozen) has decided to purchase the DIVA system and configure an electronic journey planner. Using DIVA 4, the data of every carrier, including Italian Rail (TRENITALIA) in South Tyrol, is to be entered and processed for the journey planner. The system includes an interface and the decentralized input of timetables using the timetable editor in DIVA Web. The EFA journey planner will go into operation in multilingual mode and include classic internet journey planning and both a call center layout and a layout for mobile devices. In addition, timetable books and stop timetables can be generated for urban and regional transport using DIVA 4.

DIVA Planning Software for Abu Dhabi.

The Department of Transport in Abu Dhabi is pursuing ambitious goals. In keeping with their mission statement to "regulate, plan and develop an efficient and well-integrated transport system that serves the public interest", a planning system was tendered for public transport in Abu Dhabi, Al Ain and regional transport at the end of 2009.

mdv collaborated with our partner IAL Serco Middle East for the tender offer. After several stages of negotiation, mdv/ SERCO IAL were awarded the contract in July 2010. In Abu Dhabi, the complete range of DIVA products will be used for transit planning, including optimization and presentation. The main focus of the project is analyzing the current transport situation. Consequently the first project goal was to evaluate existing performance data and in doing so, obtain appropriate driving and stopping times for scheduling. Currently, vehicle and duty scheduling is being implemented for the area near Abu-Dhabi Island.

West Midlands Region to use mdv Software

WEST MIDLANDS PASSENGER TRANSPORT EXECUTIVE (CENTRO) and WEST MIDLANDS TRANSPORT INFORMATION SERVICE LIMITED (WMTIS) decided to go with mdv software in November/December 2010. The region houses the second largest city in Great Britain, Birmingham. The region also contains the huge urban center in the West Midlands which includes several big cities like Wolverhampton and Coventry, the latter of which is located in West Midlands County.

With its 5.2 million inhabitants, West Midlands borders directly on Traveline Regions South West, South East and East Midlands. Now with six regions that work with DIVA/EFA (West Midlands, East Midlands, South West, South East, East Anglia and London), the entire Midlands Region and South England are organized with mdv software.

EFA live in Sydney

The second EFA installation in Australia went live in August of 2010. Transport New South Wales (www.131500.com.au) operates an internet platform with the goal to provide passengers the State of New South Wales with information required to efficiently and successfully plan a journey. In addition to the internet platform, a call centre is available round the clock at the following number: 131500.

The internet platform www.131500.com.au has been in existence for several years and has a large number of regular users. The particular challenge in this phase of the project was to quickly replace the existing internet platform with the new one. The new system was immediately under a full load.

In addition to EFA and DIVA4, mdv supplied the content management system (based on Plone / Zope), a mobile journey planner (http://mobile.131500.com.au) and a voice service (in cooperation with our partner Excelsis) to the project.

In the next phase of the project, the existing platform will be enhanced and a number of other services will be made available. We will report on the project in more detail in a future issue of mdv news

Events

5. ÖPNV-Innovationskongress
22 - 24 February 2011 Freiburg, Breisgau

48. User Group (international)
7 - 8 April 2011 in Garmisch-Partenkirchen, Germany
Host: Bayerische Eisenbahngesellschaft mbH, Munich
http://www.bahnland-bayern.de

AGIT 2011
Symposium und Trade Fair
Applied Geoinformatics
6 - 8 July 2011, Salzburg

IT-TRANS
IT Solutions for Public Transport
15 - 17 February 2012, Karlsruhe

InnoTrans 2012
International Trade Fair for Transport Technology
18 - 21 September 2012, Berlin