THE END OF FAKE NEWS

Customer project

When changing vehicles, every minute counts. MENTZ brings real-time information on board BVB buses and trams. Fake news on displays and wasted sprints to vehicles that don't leave on time are becoming a thing of the past.

Switzerland, Basel

Product	IRMA (Interchange Refinement and Management of APIs)
Function	Background system for real-time in vehicles
Contact	nguyen@mentz.net

MENTZ is bringing a pioneering service to buses and trams: passengers can already see via on-board displays what will happen at the next stops on the journey. How do I get to the connecting route? How many minutes do I have to wait until my connection arrives? Dynamic displays in the vehicles provide dependable connectional information in real-time.

At the BVB, the flagship project "real-time in vehicles" is underway. Displays will no longer only show next stops and connecting routes, but also real-time arrivals and current interchange options.

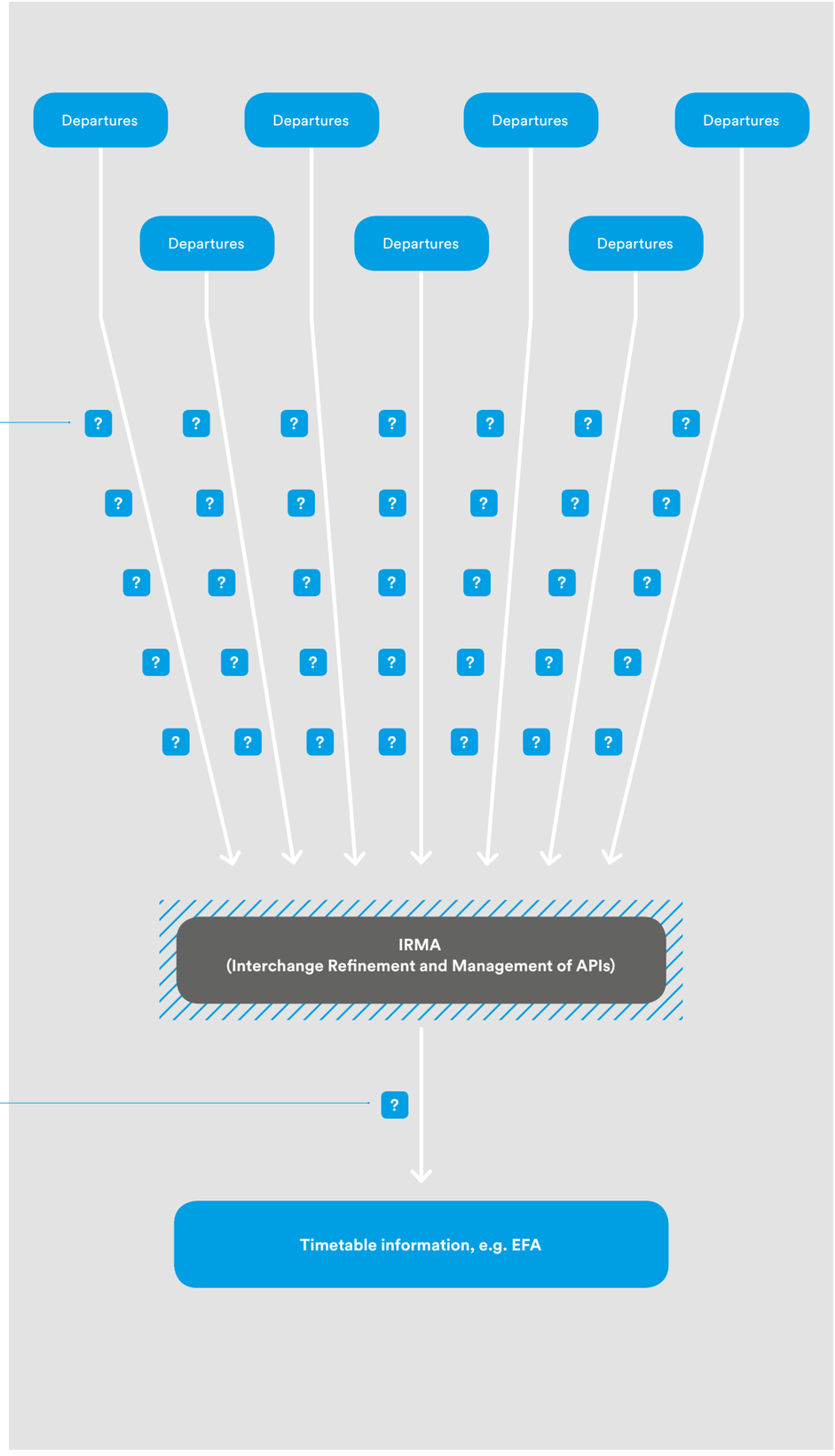
Displays for passenger information have been standard equipment in public transport vehicles for a long time. In many places, very limited information is displayed alongside the advertisements, and the news is not really up-to-date. As a result, it may not be possible to make the indicated connection due to a delay, and an unplanned alternative connection does not get displayed at all. Or the indicated interchange times are not accurate, which is why the sprint to the next platform turns out to be a wasted effort. In Basel, the age of this kind of fake news has come to an end. In the buses and trams of the Basel Transport Authority (BVB) new intelligent displays are going into operation. Now, for each stop, the monitors always display the latest information for all connections and for all means of transport. The technology for this has been developed by MENTZ.

IRMA – Data Exchange in Real-Time

The centrepiece of the flagship project "Real-time in Vehicles" is the IRMA system (Interchange Refinement and Management of APIs), which has been newly developed for the project by MENTZ. In IRMA, data are collected from and provided to various sources. Communication between IRMA, the data sources and data consumers is based on the VDV standard 431 TRIAS, an interface that is specially tailored for the exchange of data between real-time sources, vehicles and mobile apps. This makes it possible to request information from timetables, such as from the Transport Authority of Baden-Württemberg (NVBW), whose electronic journey planner (EFA) is linked to the BVB – and includes real-time information and explanatory note text. The idea behind IRMA: Integrated data from the NVBW-EFA system are intelligently cached and can thus be supplied to different customers without the request load on the journey planner spiralling out of control (see infographic p.6).

Filtering for Relevant Information

The highlight: IRMA filters the responses according to customisable rules. Authorised users of the customer's system can adjust the filter rules for IRMA in a matter of seconds. In this way, specific trips or entire routes can be filtered out at individual



REAL-TIME

Faster interchanges, faster to your destination

IRMA = INTERCHANGE REFINEMENT AND MANAGEMENT OF APIS

Intelligent filters, sort by relevance

- By stop positive/negative filters for routes can be specified
- IRMA supports route filters in the request
- Filtering of relevant incident messages
- When generating connection boards (e.g. for vehicles) IRMA also accounts for transferred information for the requesting trip – and hides correspondingly unattractive connections from view

Caching reduces the request load

- The “first” request is passed on to EFA
- If a request for the same stop is made within a customisable time period, it is responded to using the cache instead of sending a new request to EFA

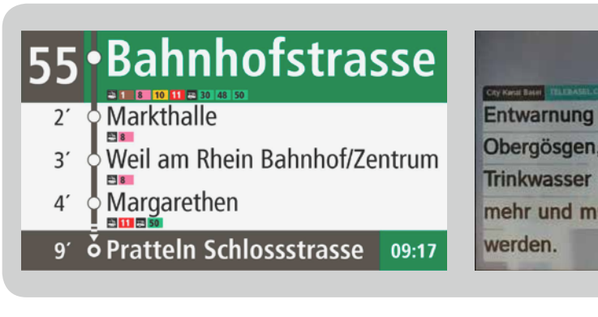
Supported formats: VDV 431 TRIAS

stops. Unattractive interchange options, such as travelling in the opposite direction, to make the connection can be hidden. In combination with individual filtering for the requested vehicle, buses and trams are able to show dynamic connections on board.

Consistent Information in the App and on the Display

Subcontractor LTG Switzerland GmbH (formerly Gorba AG), who equip the BVB vehicle fleet with on-board displays and supplies them with passenger information, has added a GPS-based positioning function to the existing TFT display software. It enables calculation of the trip time of the vehicle. Additionally, the display system collects real-time data for connection and disruption information directly from IRMA and independently of the onboard computer – an innovation that provides operators with more flexibility and less dependency on third party systems. Using this interface, not only displays in buses and trams can be supplied with information, but smart phone and/or web applications can profit from this, too. This ensures that information is consistent across all media. MENTZ has been partnering with the BVB for many years. The family-owned business in Munich has developed the DIVA system for Basel, and supplies the EFA trip planner for the NVBW. The “Real-time in Vehicles” project will be fully implemented by the end of 2018. Release to the entire BVB fleet will be completed by the summer of 2019.

Swiss precision: even seated passengers can clearly see that their bus will arrive at Margarethen in 4 minutes.



Special service: connections with public transport are shown with actual time. If no actual time ist available, scheduled time is used.

Stay informed, even when services are disrupted: latest incident messages are shown on the display.

» We show all relevant departures

Reto Koller is the project head for operational systems at the Transport Authority of Basel (BVB), and is responsible for implementing the project “Real-time in Vehicles”, for which MENTZ is developing the back-office system. We spoke to him about the project and the topic of digitalisation.

Always up-to-date
In the buses and trams of the BVB, intelligent displays provide the latest information for each stop – for all connections and for all modes of transport.

MENTZ: Mr. Koller, so-called static interchange information notes are already displayed in BVB vehicles. For example, in a vehicle of route 34, I might see that I can transfer to route 61 at stop “Kronenplatz”. What added value do you expect from your project “Real-time in Vehicles (RiV)”?

Koller: Currently, when looking at the display in a vehicle, I can only see which basic interchange options exist. These displays are only really showing static information, meaning that they represent only a pictogram for each stop. I can’t tell if my next connection will actually depart. This additional information is especially useful during off-peak hours. If we stay with the current example: at night, route 61 only departs every half hour. If I’m on route 34 and see that the next departure is in 25 minutes, I might decide to take route 34 a few more stops and then walk ten minutes. I would get to my final destination quicker than if I had waited at “Kronenplatz”. But if the 61 departs in five minutes, I’ll take the connecting vehicle and ride to a stop that is closer to my final destination. This situation is common for commuters that want to arrive at their destination a few minutes earlier by making decisions about where and if they should interchange between vehicles. Even tourists, who generally have more time, but don’t know the ins and outs of the local timetable, can benefit from more precise information.

MENTZ: How do you assess passenger acceptance for a system that bases its display of interchanges on real-time data – and as a consequence, can result in new dynamic trip connections, but also in familiar connections being ignored?

Koller: Clearly, the space available on the in-vehicle display is limited. We only show the next six routes, and depending on delays, the information displayed is subject to change. Yet this is exactly what passengers are accustomed to from the PIS-displays at stops: we only show the next relevant departures. By the way, we also thought about a backup-mechanism, in the event where real-time updates are not possible due to gaps in network coverage. In this situation, we show the transfers according to the planned timetable which was previously uploaded to the vehicle. Even this limited information is more accurate than the pictogram.

MENTZ: The RiV-background system, which is being developed by MENTZ, sends requests to the same electronic trip planner (EFA) that is used by the BVB trip planner and apps. Why did you select this architecture?

Koller: Basically, we had to choose from two different architecture variations. We could have sent requests to our own control centre system. The problem is that the system doesn’t contain the trips of other operators. Or we could use the EFA trip planner. Using EFA we have the departures of SBB-trains and the bus routes of other operators that intersect with our routes. EFA is constantly supplied with the latest real-time information by the central data hub and ensures that the information displayed is indeed up-to-the-minute. Moreover, we achieve consistency of information across various channels because passengers see the same information as is in the app.

MENTZ: Speaking of apps – smart phones are now the norm. They allow passengers to retrieve information en-route about when a vehicle departs from the next interchange point. Do you think that this will make the departure displays in vehicles unnecessary?

Koller: I’m not so sure. When I’m on a bus, I like to look out of the window, read a newspaper or check my emails. Returning to the example above, I don’t want to have to look up the departures of route 61 on my smart phone before arriving at “Kronenplatz”. I’d rather just check the display in the vehicle. We also show service disruptions on the displays because we can’t expect passengers to constantly check whether a route has been delayed. We see another benefit where smart phone and real-time information can complement each other in a vehicle. Just as an idea: an app could be developed for the visually impaired. Using Bluetooth, an unique vehicle identification could be assigned by the app. This could help the passenger recognise the correct vehicle when boarding. During the trip, the same real-time information in the app can be conveniently displayed on the display in the vehicle and announced audibly.

MENTZ: When vehicles exchange data with background systems, it can be viewed as a step towards digitalisation. Where is the BVB in its digitalisation process?

Koller: First – what is meant by digitalisation? At present, digitalisation is a buzzword. But considering its more precise meaning, it’s clear that we began this process a long time ago. For example, we have a computer-based control centre, and computerised timetable planning, duty scheduling and trip planning. The RiV Project can certainly be included on this list, but there are many other topics. For example, with implementation of the Swiss Federal Act for Equal Opportunity, we want to use smart phones to provide support for people with disabilities. We are also working on a digital solution to capture vehicle positions in depots, which serves as the basis for the electronic dispatch of vehicles. Also, analogue signals between the control centre and vehicles are to be replaced by digital communications. Another current project in whichI am involved, is one where incidents are still recorded first on paper and are subsequently entered into a computerised system. In the near future, a computer in the vehicle will be in direct contact with the control centre server so that the details of the incident can be transferred immediately.

MENTZ: Mr. Koller, thank you for your time.

Interview conducted by Matthias Erven.

“We already provide our customers with real-time information at bus and tram stops. Advances in technology now make it possible to also provide this service inside the vehicles themselves”, says Reto Koller, who is responsible for developing dynamic passenger information at the BVB.