

Data Modeling

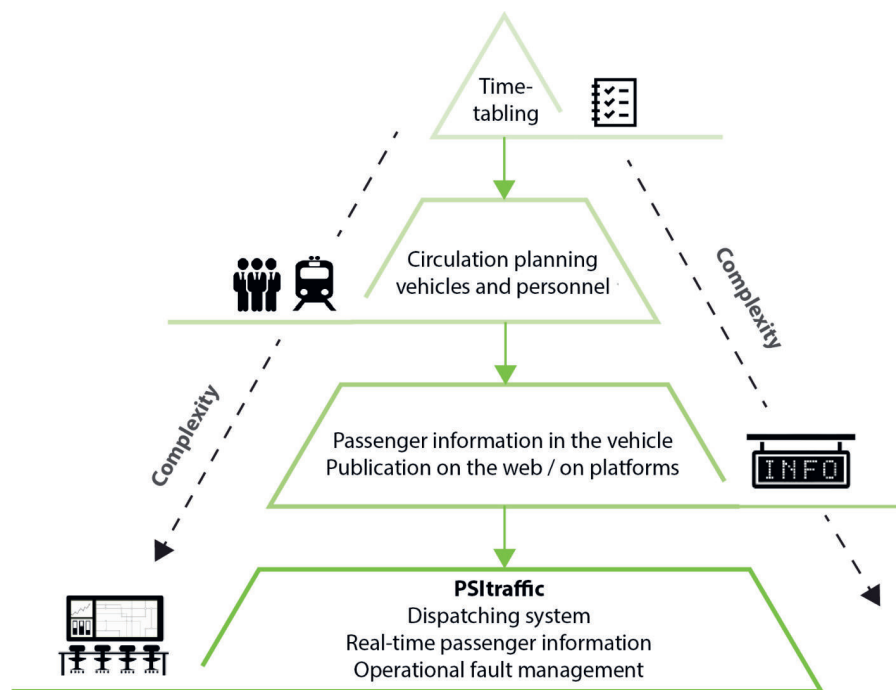
AFTER PROCESS DIGITALISATION: WHY STANDARDS ARE URGENTLY NEEDED

Almost every business process in railway companies has now been digitised. This has resulted in countless individual digital components that all too often require manual data transfer from one software to the other – with many frictional losses. The challenge: modeling a powerful overall system using standards.

More and more managers of railway companies are complaining that they have less time for their actual core business. It is almost always the same reason: companies have to put too much effort into IT issues. Where does this dilemma come from despite

the high level of digitalisation? After all, most companies now use numerous powerful software systems, for example for enterprise resource planning (ERP), personnel and duty planning, vehicle dispatching, timetabling, operational scheduling or customer information.

As always, the devil is in the detail. Most programs function as self-sufficient individual systems, while the operating processes are closely interlinked. Companies therefore have to deal with many media discontinuities – see illustration – which significantly impact efficiency. ▶



Every interface in the rail system between planning, information distribution and operational business makes communication more complex.

Source: PSI Transcom

This includes, for example, the multiple manual transfer of data into different systems or the manual synchronisation of previously independent inventory systems at different times. In addition, employees have to act under high pressure. Reliable customer information depends on current planning data, for example. These are obtained, among other things, from a system for vehicle dispatching, which is only used during office hours. As a result, reworking is required in many areas – with a lot of time and a high risk of errors.

Expert knowledge is not required to derive a suitable solution for this situation: the creation of an overall IT system – with consistent processes through automated transitions.

Individual systems lack the overall context

The practical implementation of this theoretically simple equation is far more challenging. In order to assemble the individual building blocks into a powerful whole, standardised import and export interfaces are required, which only a few systems have. In addition, existing standards are not fully developed and do not fully reflect operational requirements. This in turn poses the risk of becoming “independent” due to a lack of further development. In the worst case scenario, this could require proprietary adjustments. Almost all IT systems in railway companies, for example, require infrastructure data. But there are no standards for their transmission, starting with the planning of the signal boxes and maintenance through to timetable plan- ►

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Credits: PSI

ning, vehicle scheduling or passenger information.

What it means when individual systems lack the overall context can be clearly illustrated using the example of the timetable. A timetable is usually enriched several times by different systems for scheduling use on the day of operation. For example, rolling stock and personnel must be assigned to planned journeys, as well as information for passengers on the platform, on the train and for various online information. Because different target systems are responsible for this, content, special symbols and languages for announcements and special texts each require appropriate preparation. In addition, the vehicle fleets of railway companies are usually equipped with on-board information systems from different manufacturers, which means that the companies have to operate, maintain and keep up different interfaces.

Planning and scheduling belong together

Actively promoting the further development of standards in committees is a key requirement today. In contrast to existing standard interfaces such as railML (Railway Markup Language) or VDV, the new solutions must limit the scope for modeling as much as possible. Because they stand in the way of (fully)

automatic data exchange despite high levels of conformity. Companies are also well advised to rely on existing standards wherever possible. This refers to processes in which, for example, a dispatching and customer information system such as PSItraffic imports enriched timetable data and processes them efficiently for operational scheduling on the day of operation. This also shows how important it is to break away from the prevailing IT separation between planning and scheduling.

Standards secure the future

The development of uniform data modeling and a standardised exchange format is one of the railway industry's most urgent challenges. If standards are used across the board, they ensure a cross-system data flow, reduce individual adjustments (e.g. custom tags in railML) to a minimum and at the same time ensure the necessary modularity in order to be able to flexibly exchange or renew system components in the future.

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