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SynPlan.
timetable synchronization in public transport

SYNPLAN-PLATFORM
TIMETABLE SYNCHRONIZATION FOR PUBLIC TRANSPORT SYSTEMS

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About SynPlan

Merging timetables of public transport associations into an efficient regional schedule is not an easy task. Due to the high amount of connection points, small modifications often have network-wide effects. Furthermore, changes to the timetables have unpredictable consequences on the global connection situation. As a result, the whole process is difficult to comprehend.

SynPlan is a new approach to synchronize timetables, which is based on interactive multi-criteria optimization techniques. The new concept of evaluating the timetables' quality allows a fast and competent analysis of the quality of the network. Therefore, effects of changes become directly evident. This improves the decision making process during the synchronization phase.

Initial situation

To reach their destinations, customers typically use several modes of transportation that are often run by different companies. Currently, the examination and evaluation of timetables and their connections are done manually and this process is very time-consuming. Even little variations of the timetables for some lines can enable more transfer possibilities and hence may improve the quality of the entire network.
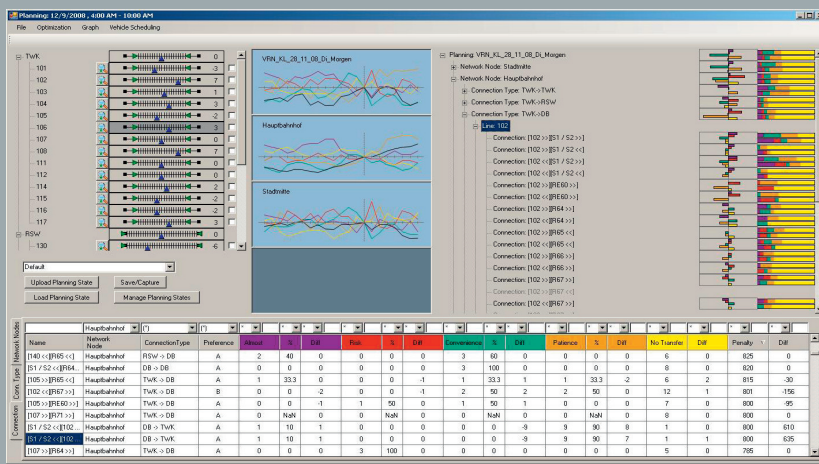
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What does SynPlan accomplish?

Analysis: SynPlan is based on a clear and comprehensible model to measure the network quality. The model is constructed hierarchically: It makes a statement about the total transfer quality down to the individual connections. After calibrating the model, these statements have a high accuracy with regard to the network quality.
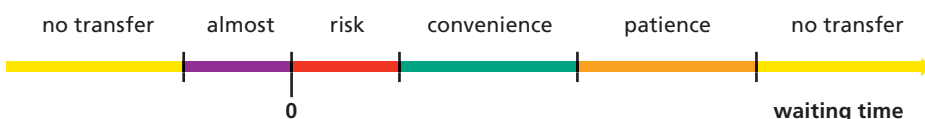
Optimization: SynPlan offers both an assisted and a fully automated optimization of the connections. In the assisted mode, the effects of changes to the timetable are presented to the user. He directly becomes aware of the benefits and the disadvantages concerning the connection quality. The mathematical optimization algorithms generate efficient modifications of the timetables automatically.

Process assistance: SynPlan assists the process of improving the network-wide transfer quality. It also provides a tool that allows the user to evaluate and to analyze different planning scenarios. Furthermore, it improves the communication between the traffic associations and the public transport companies.

The evaluation concept: An adequate evaluation function is an important element to synchronize timetables in public transport networks. SynPlan does not intend to minimize the waiting time for all passengers, since short waiting times increase the risk to miss the favored connection. SynPlan rather generates more comfortable connections for the passengers. As a consequence, the connections are divided into the classes "convenience", "risk", "patience", "almost" and "no transfer". The usage of the "almost" transfers, which have a short negative waiting time, provides a great potential to improve the timetables. On the one hand they represent an unsatisfactory situation for the passengers. On the other hand they can be altered into actual transfers with only small changes. The transfers are weighted according to their priority. To assure well-balanced timetables, the quality is not only regarded as an average of all transfers, but also from a different perspective on the detailed level of the connections. This way, the traffic planner can improve the overall timetable without losing the overview of local changes.

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1 *Screenshot of the SynPlan-Software*

2 *Classification of the waiting time in different quality levels*

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