Customer: Fraport AG
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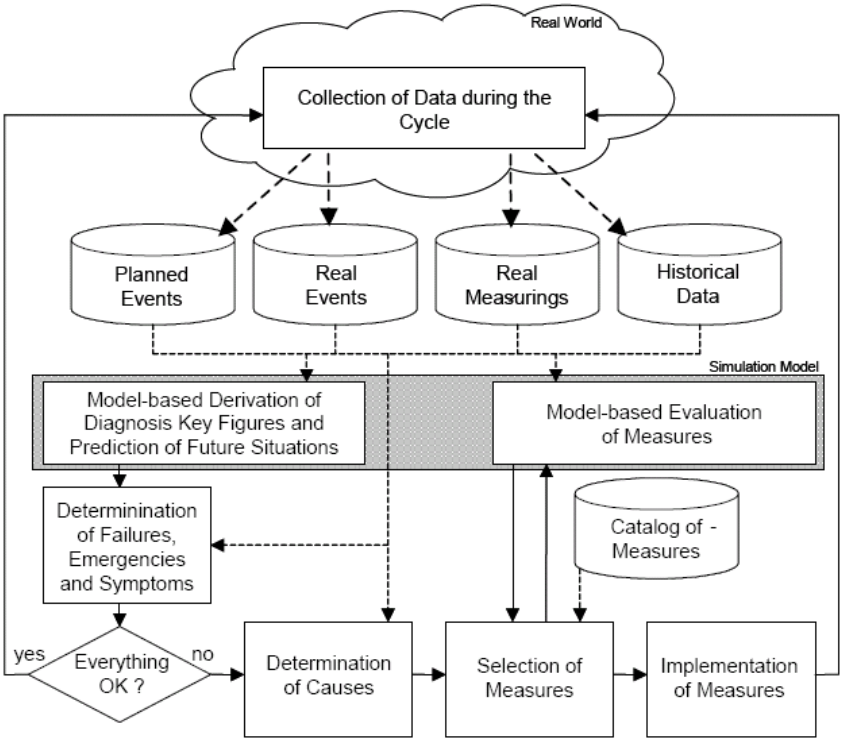
ONLINE SIMULATION OF PASSENGERS' FLOWS IN AIRPORT BUILDING

Problem definition

The objects of simulation are passenger flows in the building of a large airport. All real categories of passengers taken into account may be situated in certain areas of the airport building: departing and arriving passengers, passengers of Schengen and non-Schengen area, transit passengers etc. The controlled areas are assigned in view of geometry of separate premises of the airport and their functional destinations. Waiting halls, departure registration halls, passport control and security control areas, ways of passage, staircases, escalators, elevators etc. refer to them.

Passenger flows can be simulated during the solution of airport operation planning tasks (in online mode) and in the process of its operation with the aim of efficient management of passenger flows (in online mode). In both cases the main task is the determination of the areas where dangerous gatherings of passengers can occur. As well a significant task is determination of the expected time of delay of departing passengers in view of a real situation in the airport areas.



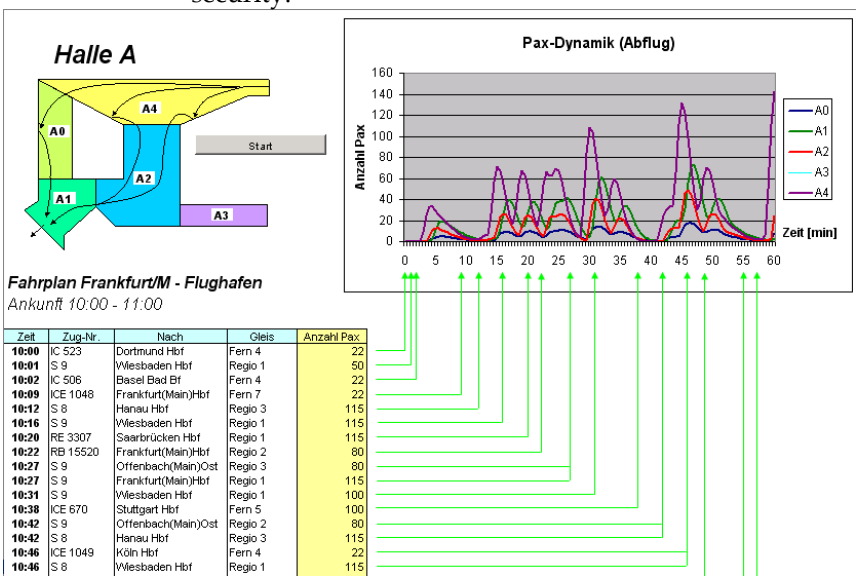
Proceeding

In the picture the principle of application of the simulation modeling in online mode for short-time (an hour ahead) forecasting of the process development in the airport areas is shown With the help of a model not only the appearing of dangerous situations is predicted but also the activities version for the prevention of such situations is tested. The quick-performed model in computer are created on the basis of a special mesoscopic approach to passenger flows simulation. The results of simulation, which are updated each 5 minutes, in graphic form are reflected on the control panel of security of processes in the airport.

Before each start of a model, its initialization is performed when the data about the current situation in the airport area are used. During the processing of a model the planned events that influence the processes in the airport areas are taken into account: arrival of aircraft, change of the capacity of passenger service areas etc.

Results

Main numerical results of simulation present graphs of changes of passengers numbers in the airport areas (see the second picture). On the basis of these graphs solutions about the realisation of measures for ensuring of passenger flows security.



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