COLLABORATIVE AIRPORT PASSENGER MANAGEMENT WITH A VIRTUAL CONTROL ROOM

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Problem (1)

- He who travels has something to recount.
- Consideration of necessary buffer times
- Journey is planned usually on information of static timetables
- In reality, the day of travel will see unavoidable deviations of the plan.
- In the current system, the customer can at best only react to such events when he actively seeks real-time information.
Problem (2)

- Transport service providers generally do not know the current transportation demand.
- Their infrastructure runs at best according to the timetables they have set for themselves.
- This situation of uninformed individuals forms a cumulative disadvantage for transportation operators.
- Neither the customer nor the airline therefore have an effective way of proactively reacting to the current traffic situation before the journey begins.
- Proper management would help to optimize the use of resources and, at the same time, serve each customer individually.
The Idea

- *Intermodal Traffic Scheduling* is intended to show how the information exchange between the transportation providers and the passenger when there is a change in the transport chain guarantees the best possible continuation of the journey.
Door 2 Door – Introducing the Passenger-Trajectory

Ground Access

- pax begins journey
- pax enters taxi
- pax at train station
- pax enters airport

Airport Landside

- pax at check-in
- pax at security
- pax at emigration

- pax at gate

backward planning

exchange of informations between passenger and transport operators

scheduled

re-estimated target time

Passenger-Trajectory
The Details

- Intermodal airport management
  Passenger trajectory
- Scheduled, calculated, estimated, and actual tasks
- Standardisation is the key to reduce development efforts to include additional partners and stakeholders
KPI – Key Performance Indikators

Measuring intermodality?

1. **Boarding Score**
   The KPI Boarding Score records the proportion of **passengers who have actually reached their planned means of transport** (flight or public transport). Due to differing demands, the Boarding Score is given as an absolute value (Boarding Number) and as ratios (Boarding Score) in the analysis.

2. **Connectivity Matrix**
   According to the IATA definition, the Minimum Connection Time (MCT) **indicates the minimum expected connection time** that a passenger (and his luggage) requires in order to change from one flight to another.

3. **Amount of usable travel time**
   For both commercial and private journeys, it is of advantage to the traveler if he can **use parts of the travel time for productive or recreational purposes** (proportion of usable travel time).
KPI – Visualization
Boarding Score (I)

• Passenger Trajectory Tool PETRA
  single flight view

Passenger status (nowcast + forecast hybrid)

- Pax already boarded to plane
- Pax with good connectivity
- Pax arriving at gate close to OBT
- Pax arriving the gate after OBT

50 100 150 ...

Pax per flight
KPI – Visualization
Boarding Score (II)

- Passenger Trajectory Tool PETRA
  all flights view

- Pax already boarded to plane
- Pax with good connectivity
- Pax arriving at gate close to OBT
- Pax arriving the gate after OBT

common problem identification support

Pax per flight
Impact Scenario → 4 incoming trains are cancelled

Petra vis at different simulation times;
- Simulation begin;
- Simulation end;
KPI – Visualization
Connectivity Matrix(I)

- Pax_radar, full view
- Innovative human-machine-interface
- Situational awareness
- Passenger status
  - Check-In
  - Security
  - Boarding
  - Transfer
KPI – Visualization
Connectivity Matrix(II)

• Pax_radar, detail one flight event

Check-In
Security
Boarding

Forecast feature:
When is boarding completed?

Gate-Change feature

Tooltip feature

Gate as partition of circle

Radius =
time to departure (logarithm)
KPI – Visualization
Amount of usable travel time

- Optimode.app

www.optimode.net/tr/
Virtual Control Room
Web Prototype

http://www.optimode.net/web_vr
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Normal Scenario

Petra vis at different simulation times;
- Simulation begin;
- Simulation end;
Impact Scenario with measures applied

Petra vis at different simulation times;
- without measures applied considered by the what-if functionality;
- with measures applied;
- after the simulation.
Conclusion

Failed Passenger

\[ \text{fail(B)} = 400 \]
\[ \text{fail(D)} = 705 \]
\[ \text{fail(W)} = 464 \]