Master's Thesis

Field of Research:
Operational Aspects of Aviation

Topic:
Identification and Comparative Evaluation of Future Airport Terminal Passenger Processors

Technical University of Munich

Department of Aerospace and Geodesy
Chair of Aircraft Design

Task Description:

Airports globally face challenges of staff shortages at times of strong post-pandemic traffic demand growth. Thus, technological innovations in various fields of airport operations target on automation, especially concerning processes along the passenger flows within airport terminals. These processes include, for example, check-in, security and passport control, boarding pass check, immigration, and baggage delivery.

Besides financial considerations, terminal passenger flows additionally yield strong requirements concerning processing times and passenger throughput while only limited floor space is available. This thesis aims at setting up a database of future technology solutions for all processors along the departure and arrival passenger flows within airport terminals. Thereby, a distinction must be made between solutions currently under development ("current innovation") and those proposed but not yet developed ("future innovation"). Any future technology solution must be evaluated against current and competing solutions. Thus, this thesis comprises setup of a benchmark of all found solutions regarding their price, passenger processing time, passenger throughput, and, optionally, floor space requirements. To this end, all solutions must be evaluated within exemplary airport setups. Such representative setups comprise generic models of terminal departure and arrival passenger flows at an intercontinental hub as well as a regional "low-cost" airport to be developed within this thesis. The documentation of results shall contain an overview of optimum technology solutions identified that way. Regular reports and

alignment with the supervisors as well as presentation of results to the company management is expected. The thesis is supervised by Munich Airport International, the workplace is at Munich Airport (home/remote office possible).

Qualification Profile:

We search for a committed student (m/f/d) in the field of Aerospace, Mechanical Engineering, Management and Technology, or similar. Good knowledge of operational aspects in aviation as well as MS Excel are required, knowledge in airport operations is beneficial. Furthermore, an independent way of working and structuring work as well as a proactive, regular exchange with the supervisors is expected.

Workpackages:

WP1: Literature research on current terminal processors and future technology solutions

WP2: Development of a database of all reported future solutions for all relevant terminal passenger processors (current and future innovation)

WP3: Gathering of data for these and current solutions on: 1. price, 2. processing time, 3. passenger throughput (nice-to-have: 4. floor space requirements)

WP4: Setup of two generic model airports (intercontinental hub airport, regional "low-cost" airport)

WP5: Evaluation of future technology solutions compared to current terminal processes, benchmarking and identification of most promising solutions

WP6: Documentation of results

Basic Literature:

Airport Systems—Planning, Design, and Management, de Neufville, R., and Odoni, A., 2013 internal literature

Start of Thesis:

anytime asap

Supervision:

TUM/LLS:
Xueqing Nie

Munich Airport International GmbH:
Johannes Michelmann

Applications under:

Keywords: * Matlab * Messtechnik *Propeller *