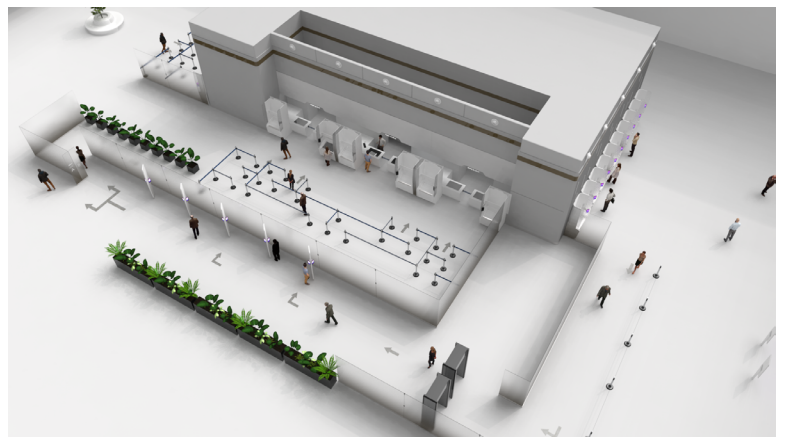


Optimized Utilization of Airport Security Infrastructure

A prime example of successful systematic problem analysis, competent creation of solution concepts and target-oriented prototype production, all based at the IFT

The Institute of Manufacturing and Photonic Technologies (IFT) is recognized throughout Europe as a leading research institution in the field of machine tools, production technologies and process optimization. One goal of the TU Wien and the IFT is the efficient transfer of knowledge and technology from researchers to industry partners. The research area known as "Process Innovation" at the IFT develops solutions from continuous process development and improvement, and from systematic testing of systems and components using Failure Mode and Effects Analysis (FMEA). This is then followed up with a prototype concept, test series and product development in coordination with our industrial partners.



Multiple drop-off stations in parallel, multiple reclaim stations in parallel at the other end, the optimized security check in between

Use case: Security Infrastructure

Airport managers and operators of infrastructure for the security control of passengers and their hand luggage approached the IFT with the following problems:

- low utilization of personnel and equipment (<40%)
- unpredictable process times due to variable user groups
- hotspot problems (e.g., during the pandemic)
- staff shortages and rising personnel costs

Goal

An improved, flexible, scalable, long-term solution should be developed for the process of security screening of passengers and their cabin baggage.

Approach

The systematic analysis quickly showed that a mere expansion or acceleration of the existing system would not provide a long-term solution. Instead, the processes and equipment must be reworked from the ground up. With the help of processes and methods from the fields of intralogistics and product planning, a novel and future-oriented system was developed.

The IFT's Contribution

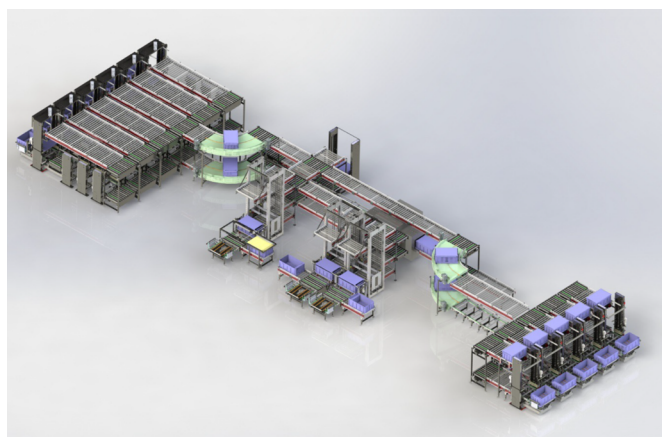
The following services were provided to the client by IFT over several project phases:

- Continuous process / product analysis and risk assessment (FMEA)
- Validation of passenger and transport flows using discrete simulation environments
- Optimization of equipment, prediction of optimal staff deployment
- Implementation of knowledge gained in equipment construction design and control, as well as in partial-component manufacturing
- Development of a modular system for security check in the many different types of airport areas

In order to be able to analyze and understand the current security check process, two approaches were pursued. The existing process was observed using Design Thinking methods, in order to gain an understanding of the prevailing problems for passengers and airport operators. This understanding served as the basis for redesigning the old process in a completely new, more efficient way. By means of FMEA as well as by creating a digital image (digital twin) and thus simulations, the new process is now continuously being analyzed, confirmed and developed.

Results and Benefits

The result of the research is a new type of security process that can be individually adapted to existing airport infrastructure. A modular system of technical components was developed, that enables airport operators to make better use of the space they already have and to counter rising personnel shortages.



Development of components for a modular system

Passengers have the advantage of being able to drop off and retrieve their cabin baggage individually, regardless of how much time other passengers require. Their baggage is guided through the process in a theft-proof manner. Interaction with other people is minimized, making the security check more pandemic-proof.

Notes

At the heart of the new passenger security check is the separation of people from their carry-on baggage. It allows for a more flexible utilization of the security check by passengers as well as a bundling of cabin baggage in front of the Computer Tomography (CT) scanners. Bundling can significantly improve the capacity utilization of airport staff and equipment. This improvement, together with an adaptation of the transport containers, can increase utilization of CT equipment by more than 60%.

What we offer

We have more than 40 years of experience with innovation in the field of machine tools, production technologies and process optimization. The experience gained from our many research projects and industrial partnerships enables us to provide effective cooperation, competent consulting and efficient implementation of innovations.

The research area of “Process Innovation” at the IFT offers support and practical solutions for your needs, for example in the areas of:

- flow and process analysis
- process development and improvement
- prototype and product development
- design, implementation and evaluation of test series
- definition and layout of optimized manufacturing processes and lines, e.g., for the production of components and products
- methods for quality control and to determine success rates
- support in scaling manufacturing
- optimization of processes and products as well as innovation with regard to technology, resource consumption and economic efficiency

Contact

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