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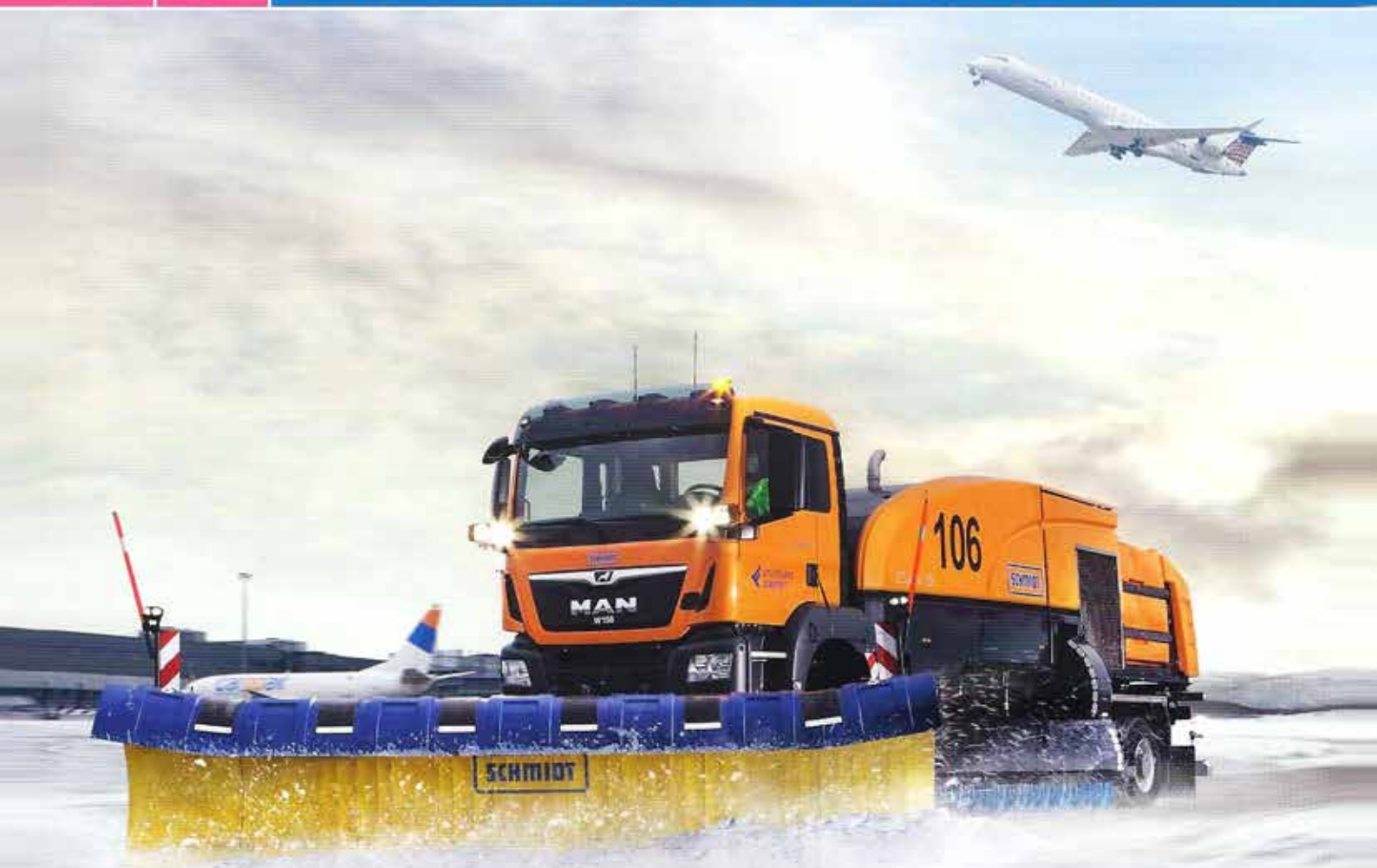


Winter Operations

Exploring how airports and airlines ensure operational efficiency throughout the winter season

Creating a **stress-free** journey

José Rui Marcelino and *André Castro* of design and consultancy, Almadesign Studio, reveal the innovative EU-backed PASSME project, which was launched to enhance the passenger experience and improve operational efficiency.

ANDRÉ CASTRO is a partner at Almadesign Studio and a researcher at the Lisbon School of Architecture. He holds a degree in Design and is currently finishing a PhD. His professional experience involves automotive, railway and aircraft projects from the concept design to development and prototyping, and is currently a visiting assistant professor teaching courses in design project, ergonomics, sustainability and business design.

BETWEEN June 2015 and May 2018, 12 European partners combined their expertise to reduce door-to-door air travel time in the EU by 60 minutes and make the airport experience less stressful and more enjoyable for passengers. PASSME stands for personalised airport system for seamless mobility and experience. The project consortium developed four breakthroughs areas:

- Passenger demand forecast system
- Luggage flow management
- Redesigned passenger centric airport and aircraft interiors
- Personalised device and smartphone application.

Breakthrough One: Passenger demand forecast system

The PASSME passenger demand forecast system uses information from airport sensors (e.g. Wi-Fi, Bluetooth and BlipTrack) and the PASSME app to support the management of passenger flows at the airport. The system can predict passenger demand at different points of the airport, such as security, border control and baggage reclaim, 30 minutes ahead of time.

The system enables the adequate and timely adaption of airport resources and services, from staffing, to the anticipated demand at potential airport bottlenecks. At the same time, the passenger demand forecast system helps to provide passengers with real-time information about their flight and how to reach their gate on time. Partner NLR, the Netherlands Aerospace Centre, was responsible for Breakthrough One.

Breakthrough Two: Luggage flows

PASSME research demonstrated that the sooner luggage is separated from the passenger, the better their journey will be in terms of both time and passenger experience.

For checked-in luggage in particular PASSME discovered that using a baggage transfer service to separate the passenger from their luggage even before they leave for the airport can save as much as half an hour in travel time. The Delft University of Technology was the partner responsible for Breakthrough Two.

Breakthrough Three: Redesigned passenger-centric airport and airplane interiors

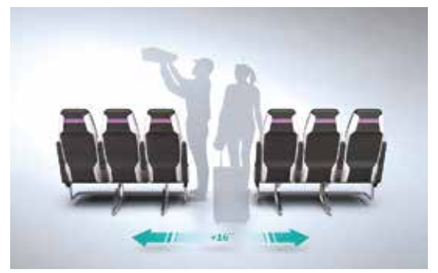
Breakthrough Three aimed to reduce unwanted travel time, passenger stress and improve comfort through the redesign of airport and aircraft interiors. These modifications focused on different stages of a journey – the security area, boarding gates and aircraft interiors. Portuguese partner, Almadesign, was responsible for Breakthrough Three.

Security area

The layout of the security area has been redesigned to reduce waiting time, stress and processing times using two separate lanes, one for the passenger and one for an airport cart, in which passengers can store their luggage and personal items.
To make queuing time in the security area more productive, the cart allows passengers to unpack at an earlier stage of the process. When picking up the cart or during queuing waiting time, passengers can unpack and keep their personal belongings close to them. The cart includes a tablet support, where different information about the security process can be presented to passengers through the PASSME app which provides personalised real-time information. The use of composite materials without metallic elements allows the cart to be scanned in a specific x-ray, together with hand luggage, through a dedicated lane. The carts can be stacked to optimise airport space. The PASSME security cart was tested with a full-scale prototype and the layout was tested through microscopic simulation software tools.

Boarding area

The design of the boarding gates and waiting area can be improved through a more creative, passenger centred design. These environments can potentially improve the comfort of travelling if they integrate specific design solutions, such as soft shapes, natural material finishes and natural environment associations. Multimedia content has also been found to have a positive effect on passengers at the boarding gates, where important information about boarding procedures, as well as tips and advices for passenger comfort while flying, can be accessed. The PASSME Lounge is an interior design development for Hamburg Airport's boarding gates, in which specific furniture and video-mapping projections are used to create an immersive environment aiming to reduce passenger stress and improve comfort. The lounge elements were designed to provide a 'soft' area with seating solutions for different activities, power outlets and Wi-Fi connectivity. The video-mapping projections include



LEFT: Breakthrough One saw the development of a passenger demand forecast system

LEFT: A seat prototype, which enabled 18-inches to be added to the isle at time of boarding, was developed as part of Breakthrough Three

LEFT: Redeveloped lounges are aimed to reduce passenger stress

RIGHT: The layout of the security area was redesigned to reduce waiting time

JOSÉ RUI MARCELINO has a degree in Mechanical Engineering from IST, Lisbon, a Master's in Transportation Design from SPD, Milan, and a PhD in Product Design Process Management from FAUTL, Lisbon. In 1997, he founded Almadesign Studio where he is responsible for the company management and design projects for transportation, product, and interior design. He has been engaged in fostering collaborative R&D projects in the transportation area – aeronautic, automotive, railway and airport – which involve several industrial companies and R&D institutions for the development of innovative solutions.

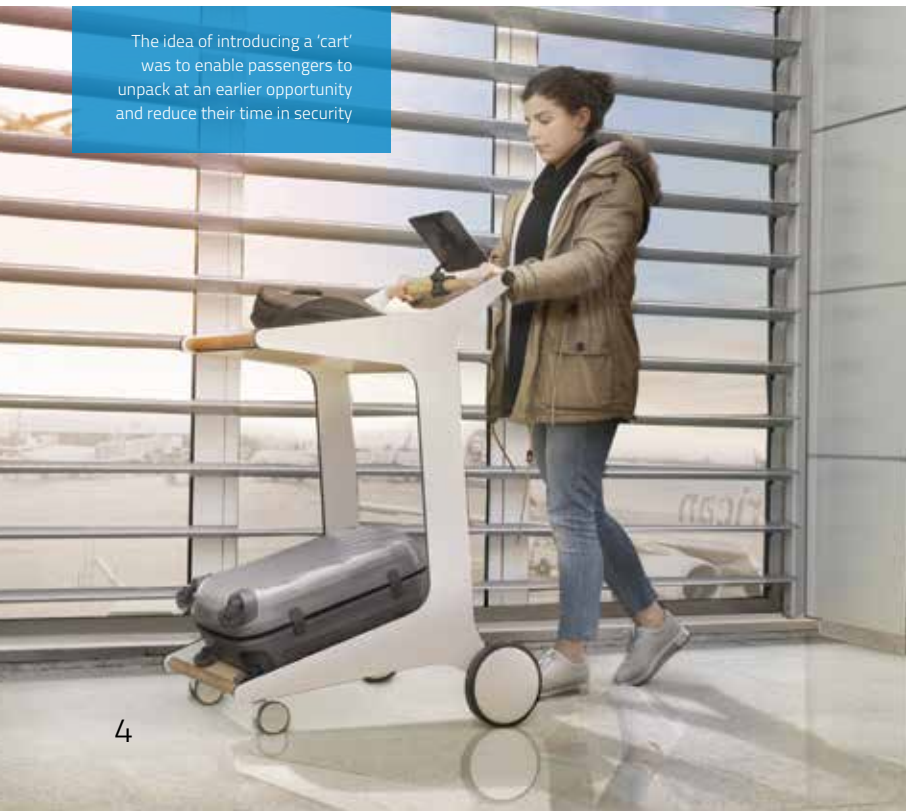
information on boarding and flight procedures such as documents to be kept by the passenger and tips and advices for comfort during the flight.

Aircraft interiors

The design of the aircraft interior was addressed by PASSME due to bottle-necks which occur during boarding and disembarkation. These are often associated with time delays, largely because of the interior layout of aircraft and the boarding procedures. The development of a specific PASSME seat concept, which can adjust to increase the aisle width while still accommodating passengers comfortably, was the solution to reduce boarding time and stress levels. Passengers board using an aisle that is 100 per cent wider (from 16-inches to 32-inches) which dramatically reduces aisle blocking (e.g. waiting for a passenger to store their luggage in the upper bin). Once all passengers are seated, the system goes back to a standard aisle width for taxi, take-off and cruising. After landing, the system goes back to the initial position (a wider aisle) for passengers to disembark the aircraft more efficiently. By reducing boarding and disembarking times, the system can benefit the airlines by reducing turnaround time and delays. This concept was tested in the TU-Delft 737 Lab with results of up to a 30 per cent in reduction time. The same results were achieved in the microscopic simulation developed by DLR. The PASSME seat prototype was also a finalist at the Crystal Cabin Awards 2018 in Hamburg.

Breakthrough Four: Personalised device and smartphone app

The PASSME app is an innovative combination of personalised device and application, which allows passengers to de-stress, feel in control and make the best use of time while at the airport. The app uses indoor tracking to help the passenger navigate around the airport with ease, while also providing real-time personalised information from airport and airline systems about their flight time, luggage restrictions and airport services. Using a personalised device like a smartwatch, the PASSME app also monitors the stress level of a passenger and sends them notifications to either assist in punctual gate arrival, or to relax and enjoy the airport facilities. The Institute of Communication and Computer Systems, based in Greece, was the partner responsible for Breakthrough Four.



The idea of introducing a 'cart' was to enable passengers to unpack at an earlier opportunity and reduce their time in security

PASSME PROJECT

The PASSME project involved 12 partners (Delft University of Technology, The University of Nottingham, Optimares, the Netherlands Aerospace Centre, KLM Royal Dutch Airlines, Amsterdam Airport Schiphol, the German Aerospace Centre, Hamburg Airport, the Hamburg University of Technology, Almadesign Studio, Carr Communications and the Institute of Communication and Computer Systems) and has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 636308.