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Press release from Siemens, Barco, Inform, ATRiCS, DLR and Stuttgart Airport

“Total Airport Management Suite” software platform optimizes airport processes

The partners Siemens, Barco Orthogon, Inform, ATRiCS, the German Aerospace Center (DLR) and Stuttgart Airport have successfully completed their joint project, "Total Airport Management Suite" (TAMS). The open modular software suite optimizes airport operations and facilitates cross-operational, integrated management of air and landside airport processes. The goal of the project was to integrate various subsystems into one airport control center on the basis of a holistic operational concept, to make airports more competitive and attractive without the need for cost-intensive infrastructure work. The TAMS project was supported by the German Federal Ministry of Economics and Technology (BMWi).

According to the Eurocontrol Performance Review Report, air traffic delays cost around 1.5 billion Euros a year in Europe alone. Modern IT solutions play an important part in optimizing airport processes. Experts predict that demand for air transport will continue to grow at five percent per year on a long-term basis despite temporary crises. As a result, the comprehensive, intelligent and profitable use of existing resources is set to become an increasingly important factor for airports wishing to remain competitive.

The integration of various air and landside airport subprocesses into one Airport Operations Control Center (APOC) not only boosts the efficiency and cost-effectiveness of airport operations, but also lessens their impact on the environment. The TAMS validation demonstrated the added value available for air traffic systems - enhanced process predictability reduces delays, fuel consumption and the resulting CO₂ emissions, as well as simultaneously increasing passenger convenience.

TAMS uses a range of visualization technologies to display the information required by airport operators, air traffic controllers, airlines, ground handling companies or security forces, generates forecasts, provides optimization suggestions and supports the various airport process owners. Employees can use smart phones, desktop computers and large video walls to obtain up-to-date in-

formation on operations, general conditions, such as the closure of terminal areas, expected weather conditions or predictions regarding future operations. Decisions can therefore be taken in a pro-active coordinated way, based on a joint picture of the situation.

A portable demonstration model has been developed which provides a realistic simulation of TAMS subsystem functionality, meaning that the results of the TAMS project can be evaluated and discussed with potential users.

Individual partner contributions

Siemens Mobility and Logistics has developed the world's first TAMS-capable integration platform. It provides seamless support for typical airport processes; from seasonal flight scheduling, daily flight schedules and resource management right through to statistics, reporting and billing, as well as Collaborative Decision Making (CDM) and the TAMS 'Airport Operations Plan'. The platform links the TAMS partners' tactical arrival, departure, surface, turnaround and passenger management systems with Siemens Airport Performance Management applications as well as with video wall visualization and workflow management in a TAMS control center.

Barco Orthogon conceived and developed a control center workstation for joint decision-making processes at airports, with a focus on airside resource optimization. Using suitable Key Performance Indicators (KPIs) and "what-if" scenarios, support is provided for decision-making to improve airspace and runway capacity balancing. The integration of the coupled OSYRIS AMAN/DMAN systems (Arrival and Departure Manager) gives operators the additional benefit of being able to optimize resource allocation. This integration formed the basis of an analysis into how planning systems could be linked to control center systems to meet user requirements and how airside information could be visualized so as to facilitate control center decision-making processes.

Inform contributed its extensive experience with airport system technology in the areas of ground handling processes, process and resource optimization, as well as the HubControl Turnaround Manager. The HubControl Turnaround Manager acts as an integrated link between air traffic control and apron control and calculates all A-CDM and ground handling times as well as reliable Target Off Block times (TOBT). It was also extended to include a delay-cost logic model for the prioritization of flight handling preferences and scenario analysis functionality together with Barco and ATRiCS for joint decision preparation within the control center.

As an associate partner, ATRiCS supported the project by contributing its globally unique Surface Management System (SMAN) for the control of taxiing operations and expanded it with predictive (Variable Taxi Time Calculation) and planning (Taxi Sequencing) functionalities. Based on this development ATRiCS SMAN closing the previous information gap between in-flight aircraft and those on the ground and completing the entire process chain from approach right through to takeoff.

The DLR defined how the processes should run in future, based on this solution and ensured uniformity with the TAM and CDM concepts. For the first time in the world the PaxMan passenger manager developed by DLR can fully integrate the passenger processes with airplane processes to avoid unnecessary waiting times and minimize the number of missed flights. DLR also created a virtual airport environment, so that partners were able to test their applications in a realistic manner during development without affecting actual airport operations. As part of final validation, the anticipated value add of the complete solution was shown in line with recognized European standards. In addition, prototype DLR-systems were integrated into the virtual airport environment, and these support joint decision-making in the form of negotiations and “what-if” scenario planning, as well as offering insight into the functions of future industrial developments.

Stuttgart Airport GmbH also made a significant contribution to the investigation of system-relevant land and airside business processes and provided test data and scenarios. In addition, the company brought quality and process monitoring experience to the table and advised partners on the functional coordination of the system.

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The Siemens Mobility and Logistics Division (Munich, Germany) is a solution provider for customers whose business model is based on the optimization of passenger and freight transportation. The Division encompasses all Siemens business for international traffic, transportation and logistics management. These include rail automation, infrastructure logistics, intelligent traffic and transportation systems and also technologies for the expansion of electromobility infrastructure. You can find more information at <http://www.siemens.com/mobility-logistics>

Barco Orthogon GmbH (Bremen) is one of the Belgian Barco group of companies and specializes in software solutions for air-traffic control organizations and airports. Barco Orthogon's OSYRIS product suite offers decision-support solutions, such as Arrival and Departure Management Systems (AMAN and DMAN), Sub-Regional Flow Management (CFM) and the real-time calculation of airside Key Performance Indicators (KPIs). Also featuring in its core business is visualization software for air-traffic control centers (ODS Toolbox, OPScenter), which can display complex situational information. Barco's products and solutions, including control center solutions for airports and control centers for situational awareness, have been used for many years by numerous customers, making Barco a global market leader. www.barco.com/AirTrafficControl

INFORM GmbH is a team of air traffic industry ITC specialists who research, develop and implement the software solutions of the future in the field of airport and ground handling logistics process improvement. Groundstar, Inform's proven suite of software product solutions, is used by more than 60 air-traffic operators and at over 200 airports worldwide. It is recognized as the unmatched system solution for optimization capability and is the most complete and flexible system of its kind on a strategic, tactical and operational level. www.inform-ac.com

ATRICS Advanced Traffic Solutions GmbH (Freiburg) offers airport-specific software solutions and consultancy services. ATRICS products are used all over the world, wherever benchmarks are being set in the fields of modern taxiing operation management and automation. ATRICS systems (making up the Surface Management System) are used for individual route planning and taxiing operations at transport hubs such as Incheon, Dubai and Frankfurt alongside CDM applications geared at leveraging the optimal utilization of existing infrastructure. ATRICS supports the introduction of operational traffic systems with a wide portfolio of simulation tools. The company was formed in 2002. www.atrics.com

DLR is Germany's research center for aerospace. Its extensive R&D work in aeronautics, spaceflight, transportation, energy, defense and security is integrated into national and international cooperation ventures. Beyond the scope of its own research, DLR is responsible to the German Federal Government for forward planning and implementation of the German Space Program. Furthermore, the DLR acts as the overarching organization for the largest project-contracting operation in Germany. The DLR has a workforce of approximately 7,000 across 16 locations in Germany: Cologne (Head Office), Augsburg, Berlin, Bonn, Braunschweig, Göttingen, Hamburg, Jülich, Lampoldshausen, Oberpfaffenhofen, Stade, Stuttgart, Trauen and Weilheim, and also has offices in Brussels, Paris and Washington D.C. www.dlr.de/en

Stuttgart Airport handles around 9 million passengers a year, making it the seventh busiest in Germany. Around 70 airlines travel from here to 120 destinations worldwide. In one of the most economically developed regions in Europe, with 8 million inhabitants in a 90-kilometer radius, Stuttgart Airport is exceptionally important for public mobility and the economy in the state of Baden-Württemberg. Roughly 9,500 people work at Stuttgart Airport for 250 various companies and authorities, making it one of the largest places of employment in the state.