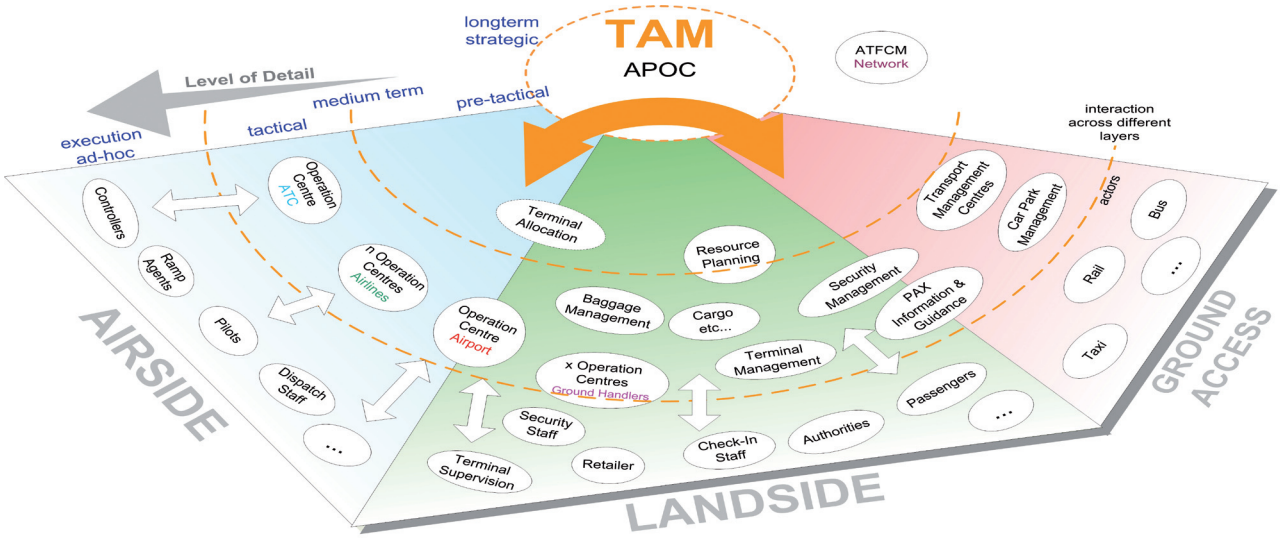
TAM - Total Airport Management

Performance-based airport operations are required for a future performance-based ATM system as prescribed by SESAR. Therefore future concepts aim at an integrated airport management, where all stakeholder processes - landside and airside - are conducted using a common data set.

Furthermore, an option for increasing the throughput is to optimise the airport operations. Nowadays operational improvements concentrate mostly on single solutions and consider short term planning. Stakeholders at the airports often do not realise the impact of their actions on other stakeholders. And quite often they do not know how other stakeholders react in a given situation. These uncertainties and complex interactions have negative impact to the efficient use of stakeholder's resources.

TAM - Holistic approach Towards Optimisation

The new Total Airport Management (TAM) approach provides a solution for more efficient resource utilisation and a holistic airport management system for airside and landside processes, based on implemented Airport CDM compliant systems and processes.

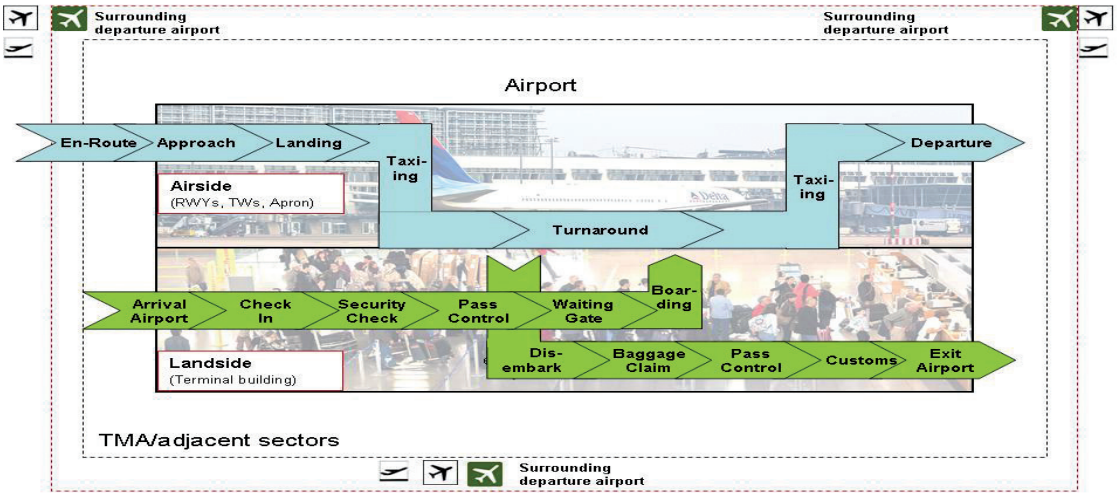


TAM - close interaction with existing tactical operation centers

To ensure an overall Quality of Service of an airport to the customers and to the air transport network, TAM concentrates on the planning phases of the day of operations (medium term or pre-tactical time horizon) using the most accurate information available.

The spatial scope of TAM is the entire airport, monitoring and guiding airside and landside operations while taking into account additional information available through SWIM (System Wide Information Management) but also surrounding airports.

TAM is introducing an environment wherein stakeholders are given the possibility to maintain an Airport Operations Plan (AOP). The AOP will be created through different planning systems. These consider flight plans, airport parameters, key performance indicators, stakeholder preferences, agreed goals and dynamic and static constraints.



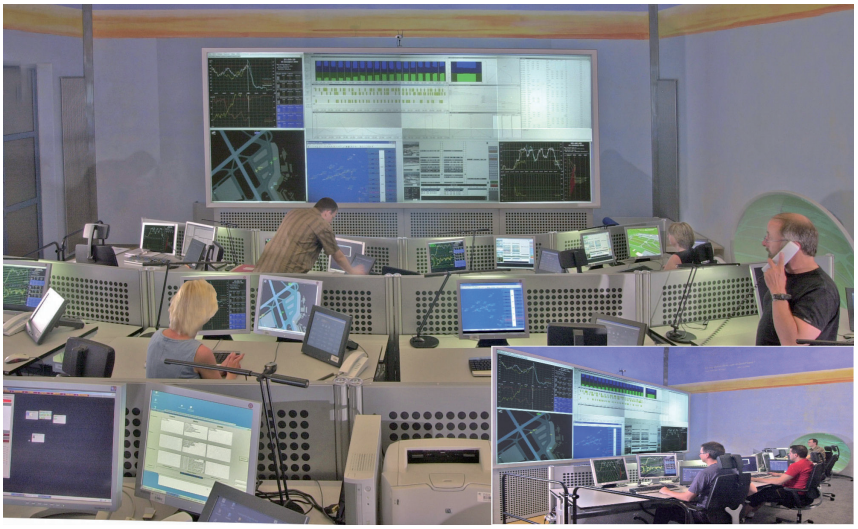
Spatial scope of TAM

Airport Operation Center - Airport Command and Control Center

The core element of the TAM management layer is the APOC (Airport Operation Center).

With an APOC a common platform is given to airport stakeholders, enabling them to jointly organise and coordinate their activities under the full situational awareness of impacts of joint decisions on their own and others' operational plans.

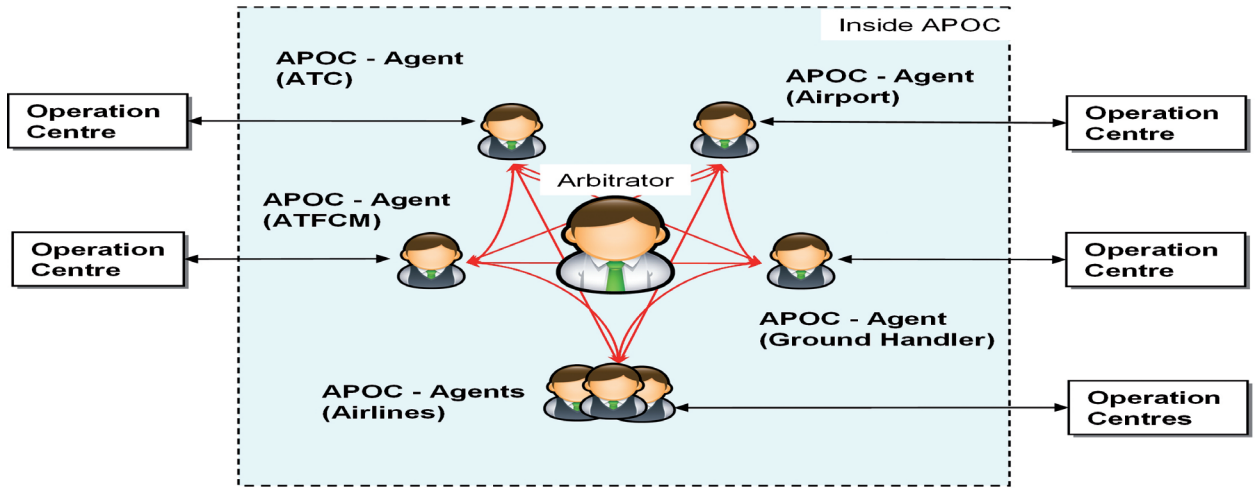
The APOC can be either a centralised physical command and control room or a distributed solution, connecting stakeholder representatives by existing and new means of supporting tools for arbitrated collaborative descision making.



The unique APOC simulation facility at AT-One Braunschweig.
Possible layout of a centralised APOC

APOC-Agents - the Contributors for Stakeholders Interests

Depending on the size of the airport and the importance of the stakeholders in terms of impact for the operations at a certain airport, various representatives will be integrated in the APOC. These so called Agents come from aircraft operators, the airport authority, local ANSP, national authority, and ground handling. Others, like ATFCM, ground transportation managers etc. can be incorporated additionally.



APOC - Agents interaction

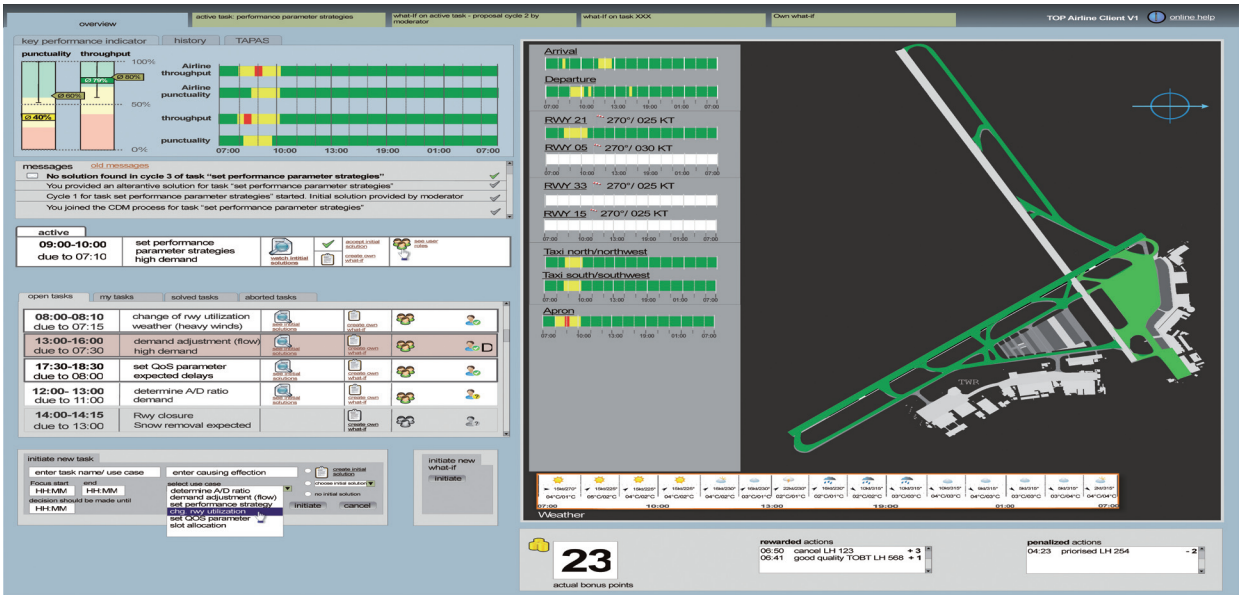
The APOC - Agents will stay in contact with their own operation centers to coordinate the required information that is passed to the central AOP computation and optimisation process. An Arbitrator will moderate the decision making processes and ensure convergence.

APOC – Systems for Shared Situational Awareness

All APOC - Agents will be provided with displays illustrating the present solution and plans for the future, indicating the parameters' settings and outlining the progress of negotiation of different tasks. Additionally, every agent is offered personalised information (e.g. in-depth information to flights of his organisation).

One of the most important tools in the APOC is the Total Operations Planner (TOP), which not only computes optimised traffic flows on a more abstract level, it creates balanced arrival and departure sequences on a flight by flight event level, taking into account dozens of different parameters. Dedicated coordinated communication with tactical arrival and departure management tools guarantees an optimised tactical plan, allowing the considering of the preset computed by TOP.

Total Airport Management



Prototype of an APOC HMI for agents that visualises TOP's planning proposals

Expected benefits and improvements

- increased efficiency and productivity of the airport operations
- pro-active reaction on upcoming bottleneck situations and restrictions
- better decision making by stakeholders based on increased situational awareness
- better understanding and the allignment of stakeholder decisions with respect to achieving an airport wide optimum of operations
- increasing predictability and enhancing operational stability for all stakeholders, taking into account different modes of airport operations, e.g. environmental friendly, maximum throughput
- enhanced predictability of the traffic flow at the airport
- incorporating preferences and constraints of customers (Airlines) in the planning process in a unique and innovative way

AT-One combines the strength of DLR and NLR in ATM Research

AT-One Braunschweig
DLR - Institute of Flight Guidance
Karl-Heinz Keller
+49 531 295 - 2506
karl-heinz.keller@at-one.aero
www.at-one.aero

Contact
Telephone
E-mail
Internet

AT-One Amsterdam
NLR - Air Transport Division
Luc de Nijs
+31 20 511 3737
luc.deNijs@at-one.aero
www.at-one.aero