

Modeling of Pre-Tactical Airline Decision Processes to enable Performance Based Airport Management

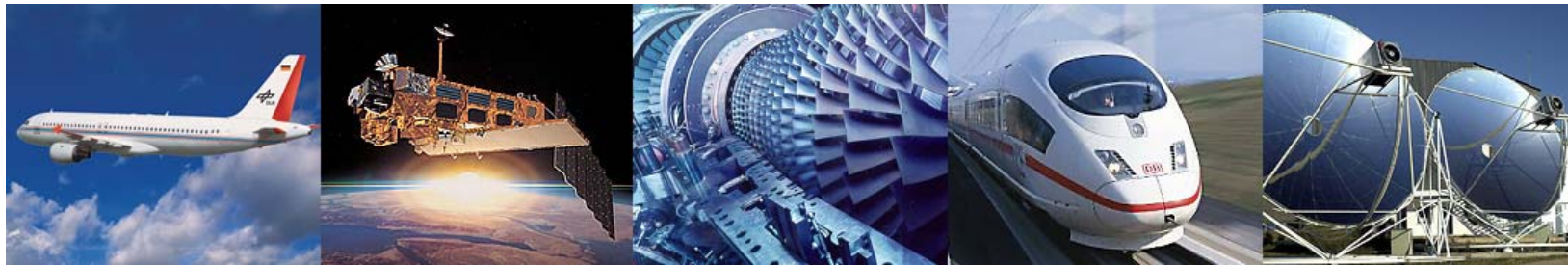
Steffen Wenzel, Yves Günther

AGIFORS Airline Operations Study Group Meeting

2015/05/07



DLR German Aerospace Center



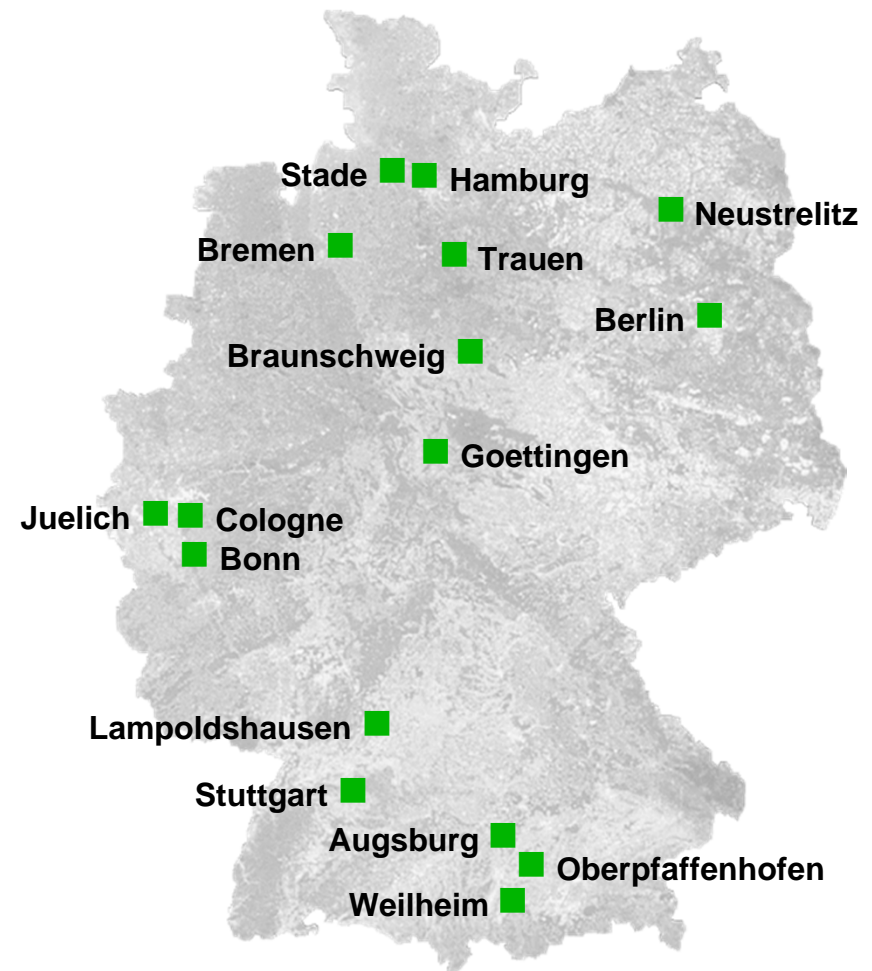
- Research Institution
- Space Agency
- Project Management Agency



Locations and employees

Approx. 8000 employees across
33 institutes and facilities at
■ 16 sites.

Offices in Brussels, Paris,
Tokyo and Washington.



Research Areas

- Aeronautics
- Space Research and Technology
- Transport
- Energy
- Defence and Security
- Space Administration
- Project Management Agency

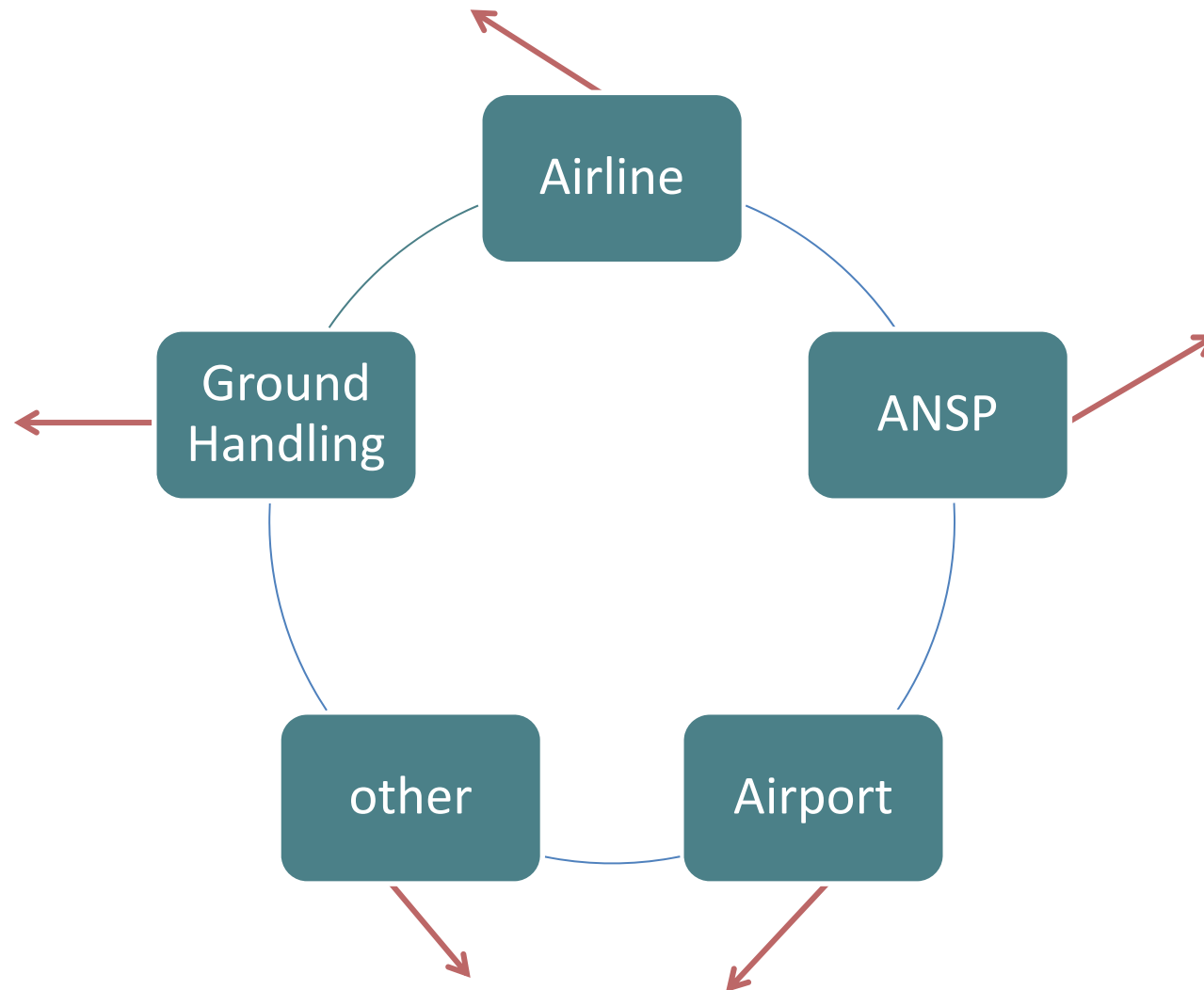


DLR Aeronautics

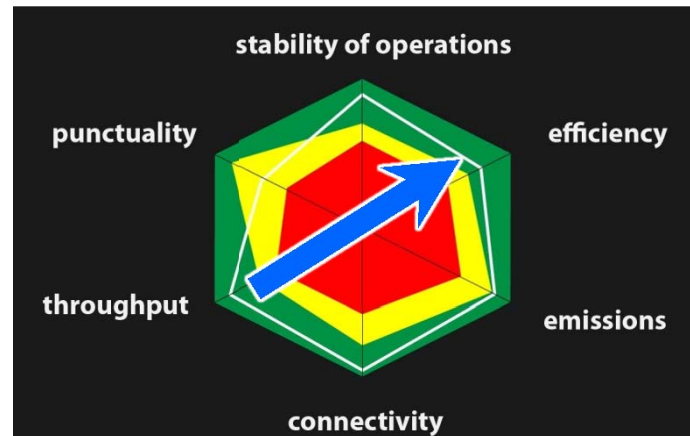
- Optimisation the performance and environmental compatibility of the entire aircraft system
- Expanding the range of helicopters to all weather conditions
- Efficient and environmentally-friendly aircraft engines
- Safe, environmentally-friendly and efficient air traffic (flight control, flight operations)



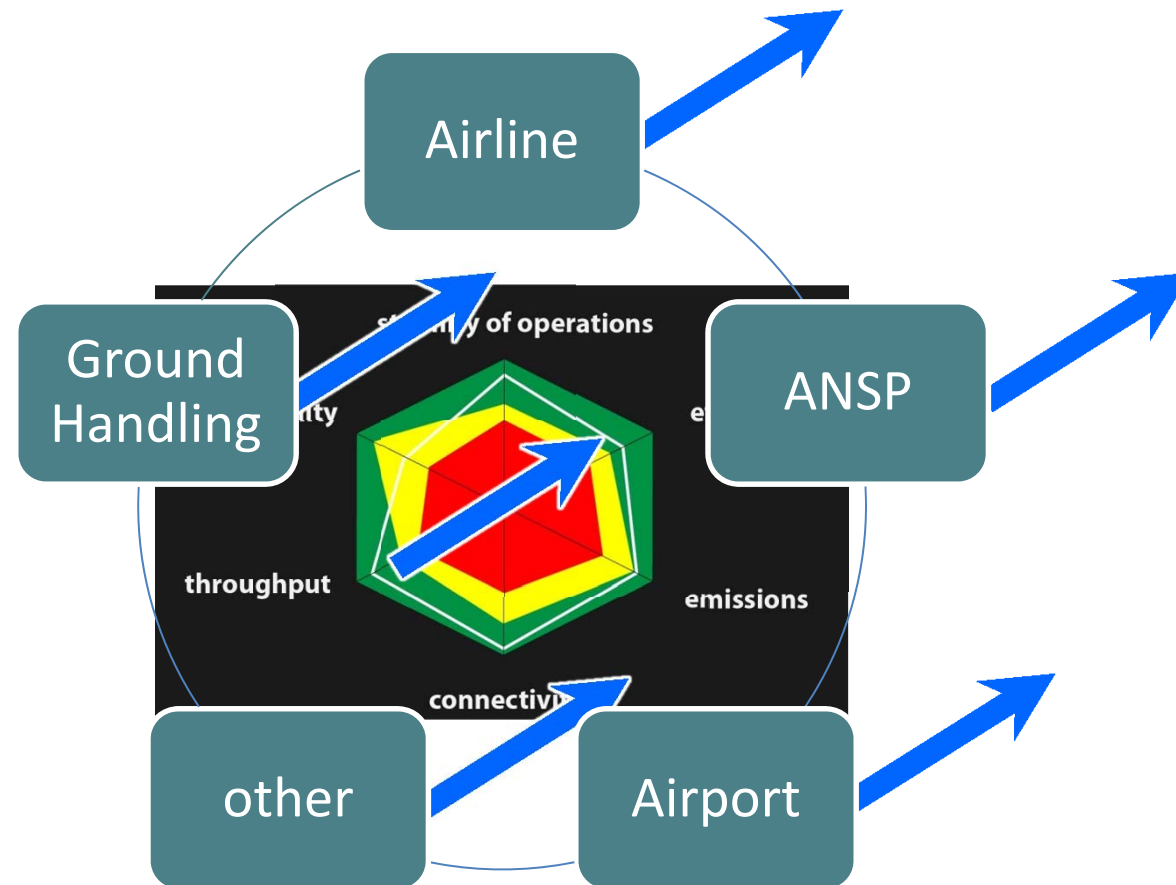
What should be changed at airports?



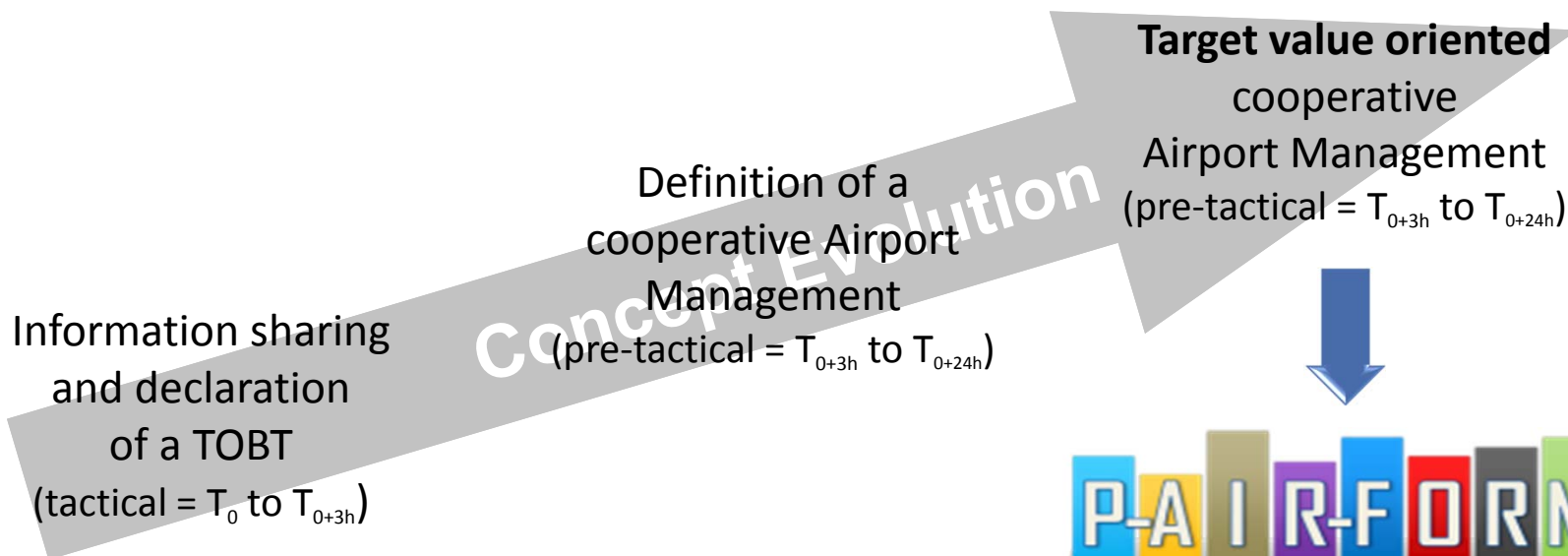
What should be changed at airports?



What should be changed at airports?



The Way to Performance Based Airport Management



Targets of P-AIR-FORM

A)

- demonstration of improved efficiency of airport operations by pre-tactical planning

B)

- show changes in ways of working and cooperation of stakeholders at airports with PBAM

C)

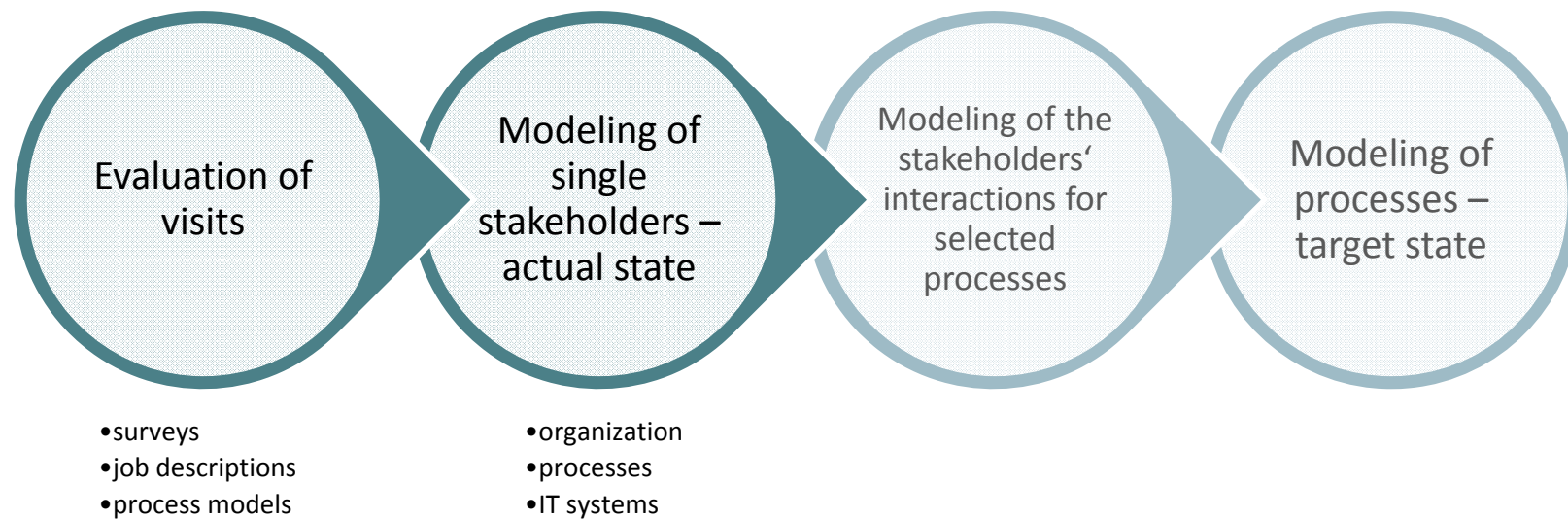
- verification of positive effects of improved weather forecasts during pre-tactical planning of airport operations



Stakeholders visited

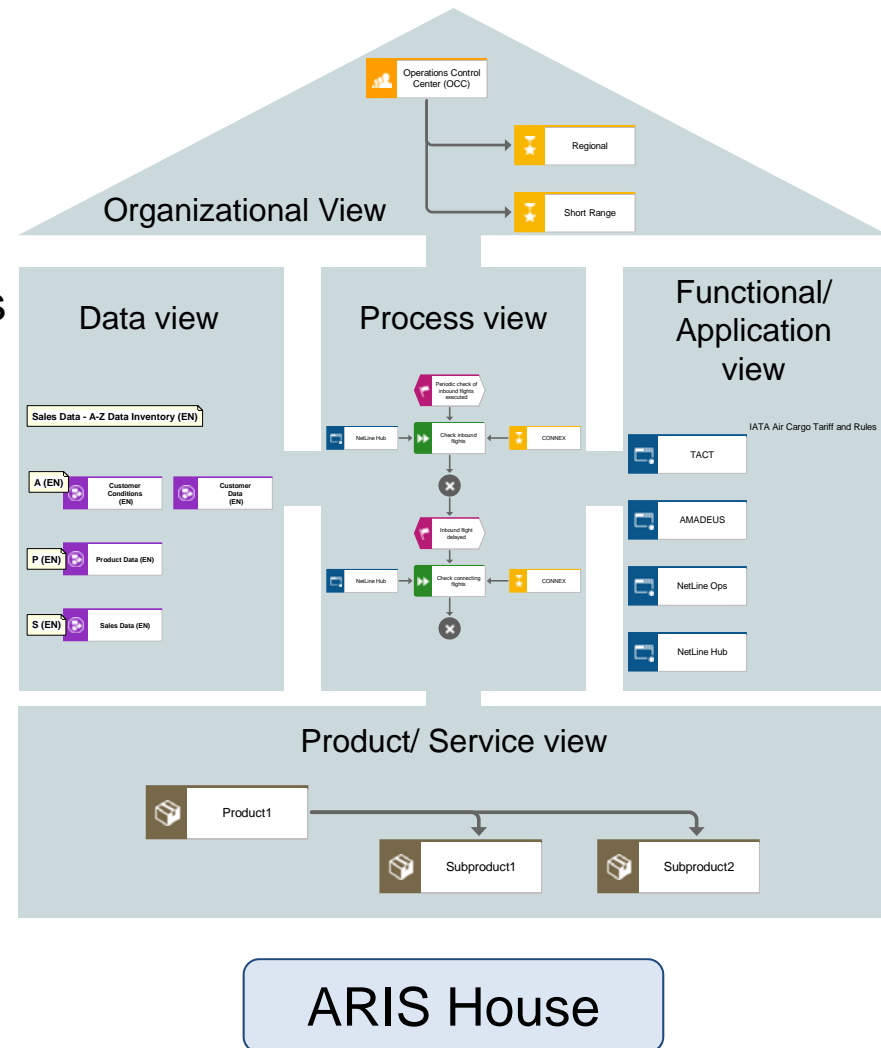


Modeling Approach

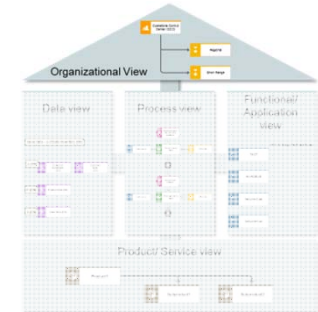


Business Process Modeling (BPM) in ARIS

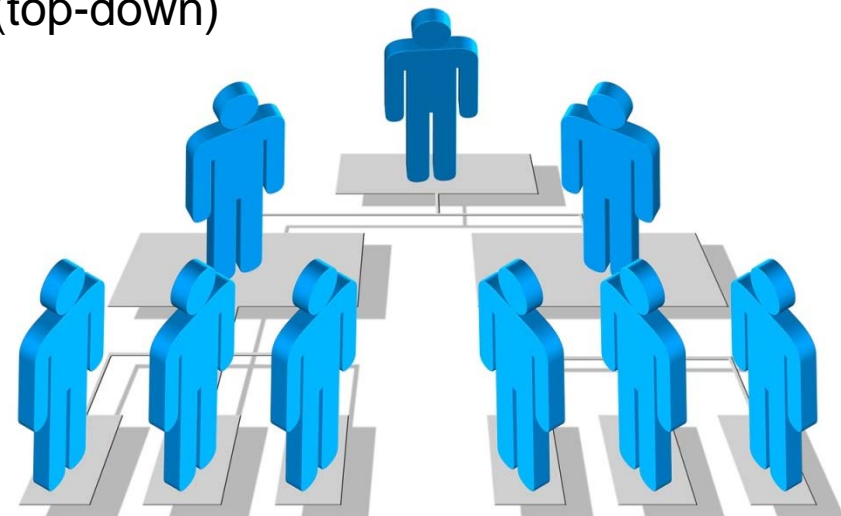
- Architecture of Integrated Information Systems – ARIS
- database with revision control
- parallel work at different company sites
- detailed modeling of selected processes
- conjunction of:
 - **Processes** (value-added chain, EPC)
 - **Organization** (organigram)
 - **Functions** (application systems)
 - Data
 - Services



Modeling of Organization 1/2

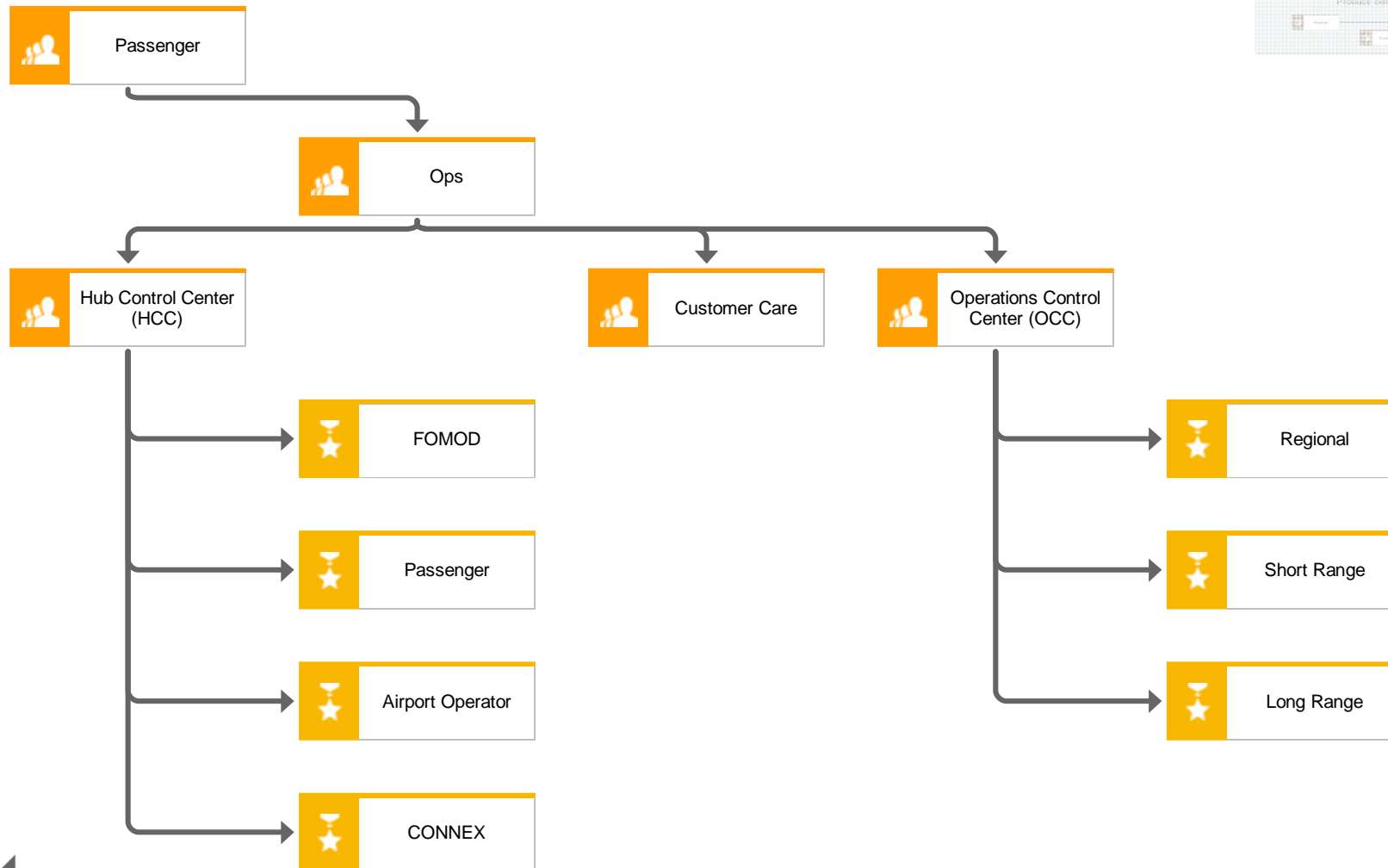


- target:
 - gain insight into the relationships within one stakeholder/ between stakeholders
 - identification of responsibilities
- organigrams
- modeling in different hierarchical levels (top-down)

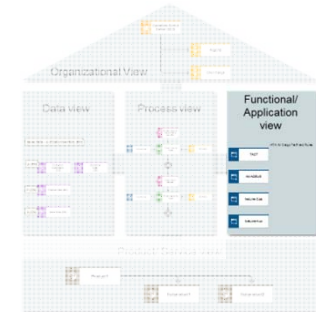


Modeling of Organization 2/2

Example: Airline PAX Segment (Snippet)

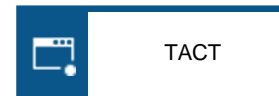


Modeling of Resources



- application system type diagrams
- overview of interfaces between stakeholders
- input for process modeling

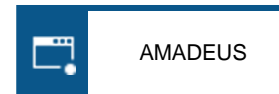
IATA Air Cargo Tariff and Rules



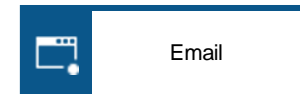
TACT



Telephone



AMADEUS



Email



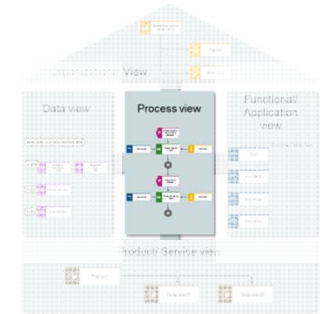
NetLine Ops



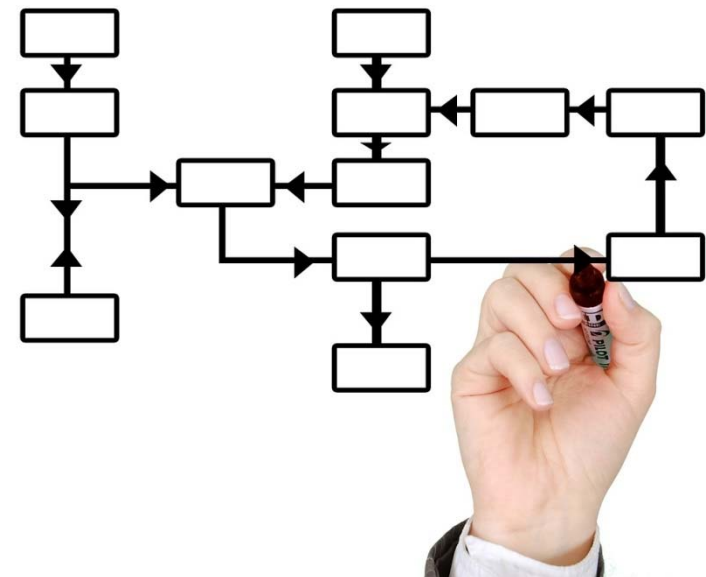
NetLine Hub



Process Modeling 1/3

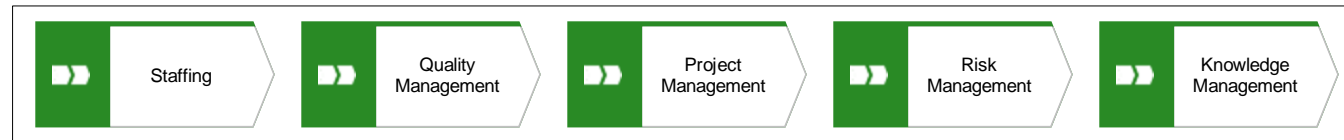
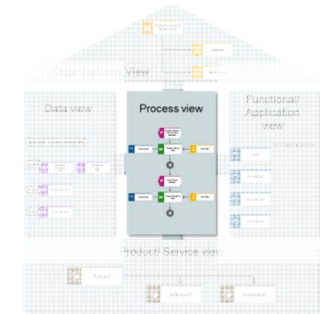


- modeling in 4 hierarchical levels (top-down)
 - value-added chain diagrams in level 1 to 3
 - event-driven process chains in level 4
- focus on pre-tactical processes

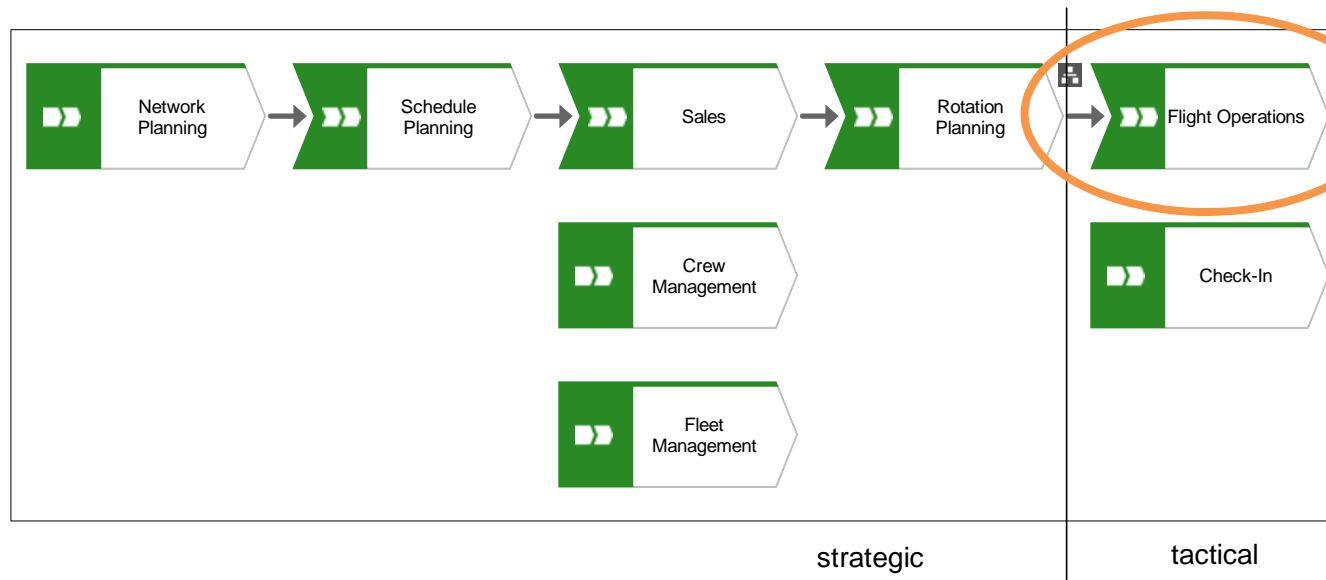


Process Modeling 2/3

Example: Value-Added Chain Airline



Management Processes



Core Process:
Conduct Flights

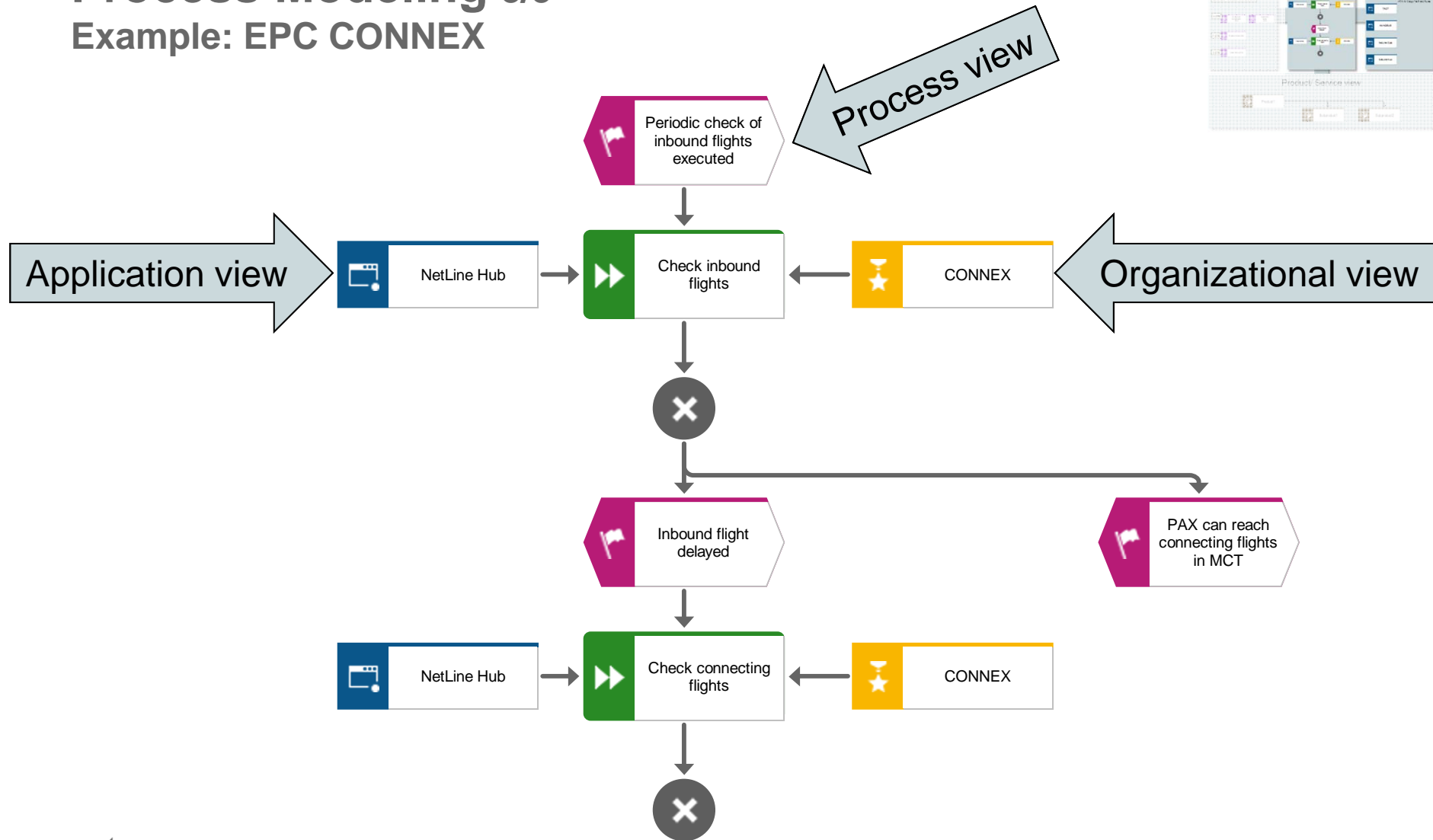
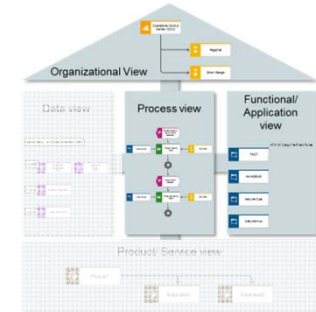


Supporting Processes



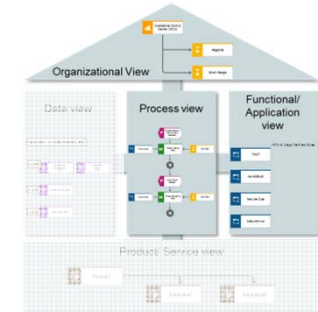
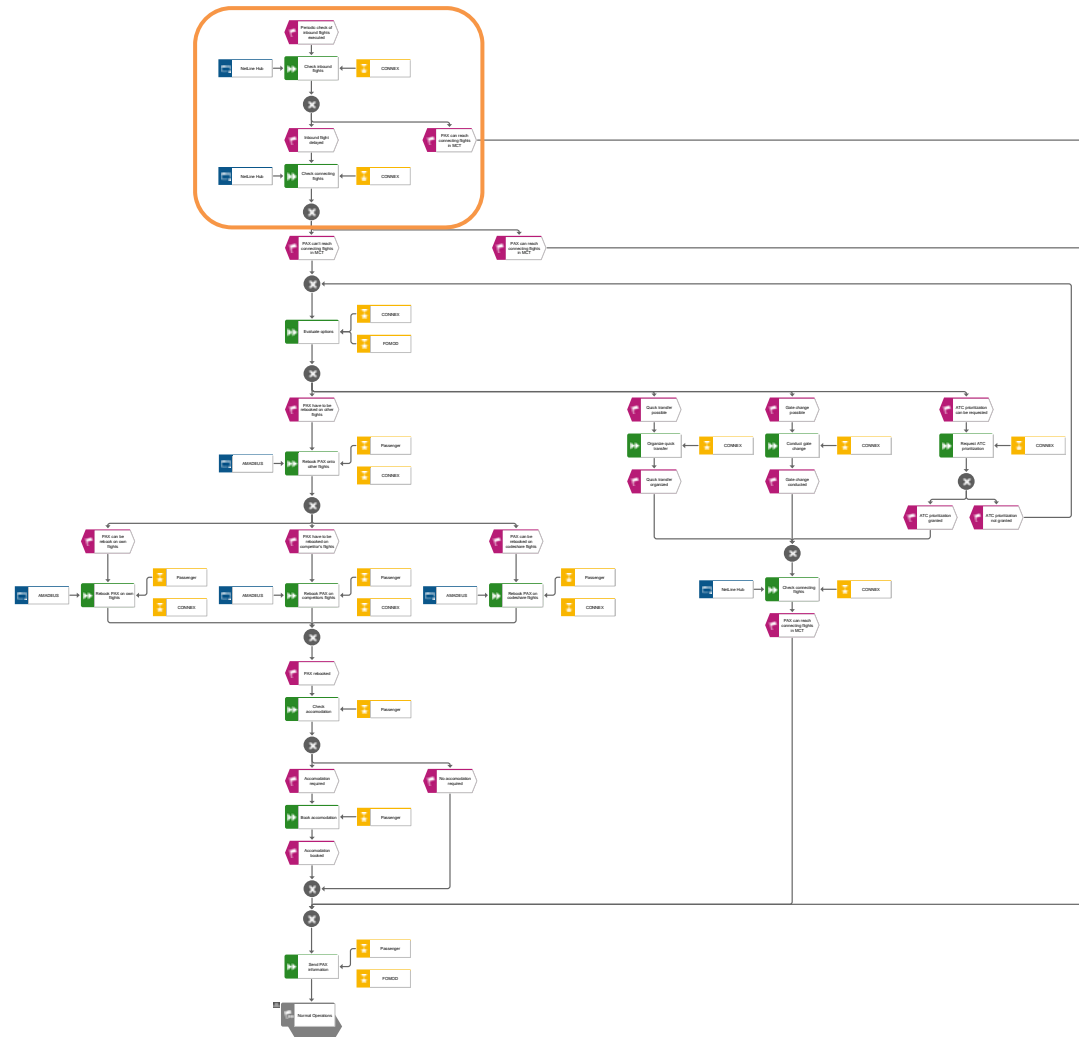
Process Modeling 3/3

Example: EPC CONNEX



Process Modeling 3/3

Example: EPC CONNEX



Airlines' Problems

- MRO Agent in HCC/ OCC missing
 - information from maintenance missing or too late
- ARR/DEP capacity from ANSP
 - missing or too late
- discrepancies between filed flightplans and EUROCONTROL data
 - ANSP agent desired
- missing interfaces of different stakeholders' IT systems (e.g. airport)
- missing comprehension of other stakeholders processes, needs & constraints
- ...

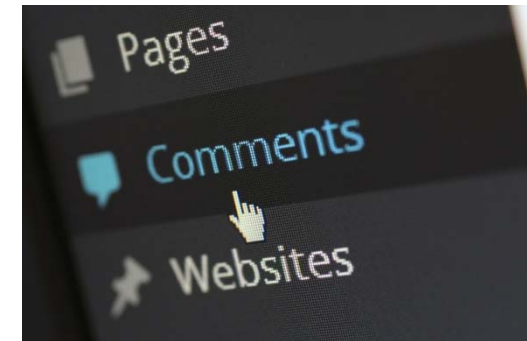


Airlines' Suggested Improvements

- better weather forecast/ nowcast
- better integration of systems
 - currently, data has to be inserted manually in up to 3 systems
 - error-prone
 - additional work & coordination (e.g. via phone)
- centralized Airport Operations Center (APOC) with all stakeholders
- ...



Recap of Airlines' Comments

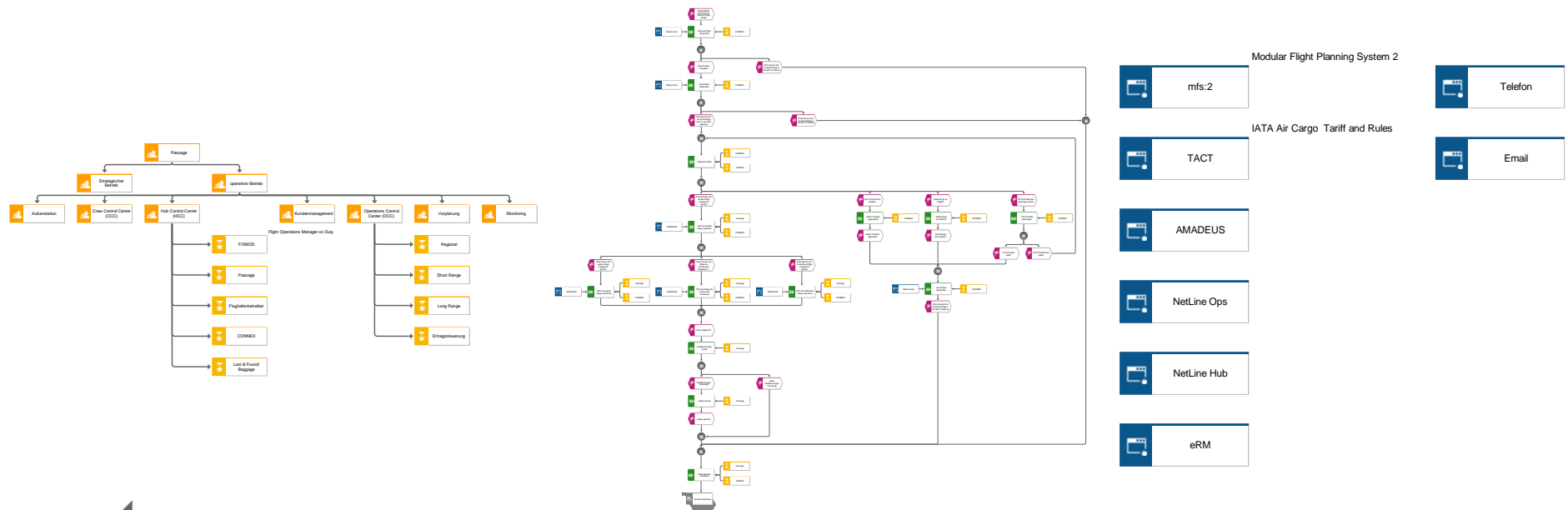


- just a snapshot of the airlines visited
- most of the suggested improvements aim at:
 - better integration of systems with automated data sharing
 - ➔ avoid errors and save time
 - get the right information at the right time
 - ➔ improved stability & reliability of planning for all stakeholders
- main aspects of PBAM
- problems:
 - integration costs money
 - willingness to share own data to other stakeholders



Conclusion

- BPM illustrates interdependencies, responsibilities and promotes Business Intelligence
- stakeholders involved in pre-tactical processes ask for better integration of systems & earliest possible information sharing in order to save resources



Way forward

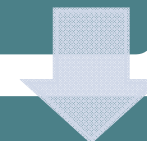
Modeling of target state of processes



Implementation costs & durations



Implementation of pre-tactical KPI
→ Evaluation of changes to the processes



Input into further concept development
of PBAM



Thank you for your attention!

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