FRANKFURT UNIVERSITY OF APPLIED SCIENCES

MBA in Aviation Management

Part 1: Performance

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Airport Performance

Managing Capacity and Capability

- Airports as nodes in the European ATM Network: where is the benefit?
- Challenges of the EATMN: A need for additional capacity
- Operational Performance indicators of a stock market driven airport company
- Regulatory impact on airport performance

The System !

« *The quality of management in a system of problems is directly linked to the quality of management of the* ***interfaces*** *between* ***sources*** *of problems* »

Pr. Russell L. Ackoff

i.e.: « If we cannot solve the problem,
at least we can aim at controlling it»

Who are the various parties ?

The Airport authority / operator

The Airport users

- The main airline / home carrier
- The others airlines (AOC)
- The passengers

The local communities

The authorities

- The Government(s)
- The Parliament(s)

Air Traffic Control

The [aircraft and engines] manufacturers

ICAO

The national civil aviation administration

FAA
IATA
ACI

Municipalities / city councils
Political parties
Local associations
& pressure groups

The Media

Who are the various parties ?

The local economic development players

- Chambers of commerce
- Local parliaments and bodies
- Unions of managers and industrialists
- Enterprises and corporations
- Educational institutions
- Job centres / agencies
- Tourism boards
- Consumers associations

The 'hard law' – enforced legislation

- Legislation
- ICAO's SARPS
- Other Recommendations

The 'soft law' – mainly minutes, reports of variable status

- The environment commissions
- The noise insulation commission
- The informal meetings/ bodies
- The slot allocation commission
- The air quality commission
- The noise national commission

The trade unions

- Air traffic control
- Airline employees
- Airport employees
- Other/ local employees

Who are the various parties ?

(Airline) Great, but what we want is this ...

(ATC) Sorry guys, but we work like this ...

(Airport) We plan this ...

(PAX) Schedule, check-in, security, delays, Travel-Value …

(Ground handling) How will we cope?

(Legislator) I have a constituency, haven't I?

(Communities) Noise + gaseous pollution, safety ...

Airport Performance

Managing Capacity and Capability

Airports as nodes in the ATM Network:

where is the benefit?

Airports as nodes in the ATM Network: where is the benefit?

A European **High Level Group** has faced a set of complex and occasionally conflicting objectives when considering the performance improvement objectives:

1. Aviation has a key role to play in achieving the objectives of the Lisbon agenda, in terms of reducing the internal and external cost of mobility [within Europe and between Europe and the rest of the world]. Like other transport modes, aviation is an important enabler of economic growth. The aviation sector itself is also a significant source of employment and technological innovation.

Airports as nodes in the ATM Network: where is the benefit?

2. At the same time capacity in the air and on the ground is increasingly scarce, the environmental impact a growing source of concern at the local and international levels, while improving safety becomes ever more challenging with increasing traffic levels.
3. Additionally, aviation [in Europe] faces growing competition from other parts of the world [for the market in Europe] and the global aviation market. This emphasises the importance of finding cost-effective solutions.

Airports as nodes in the ATM Network: where is the benefit?

The proposals of the High Level Group can be summarised in the following 10 recommendations

1. Need for a driving force in aviation regulation [in Europe: the EU-Commission]
2. Greater responsibilities for industry
3. Better regulation
4. Drive improved performance
5. [For Europe: Deliver the Single European Sky (SES II and SESAR)]

Airports as nodes in the ATM Network: where is the benefit?

6. [Empower and focus Eurocontrol.]
7. Address airport capacity.
8. Deliver continuously improving safety [(EASA)]
9. Deliver environmental benefits
10. [Commit member states to deliver]

Airports as nodes in the ATM Network: where is the benefit?

Challenges of the ATMN:

A need for additional capacity

The High Level Group Report

The (Barrot) method:

- Involvement of all actors/stakeholders
- Thorough consultation
- Open and intense debate

The result

- Total System Approach

- Airport capacity

- Environment

- Ambitious and concrete
- Workable and realistic

Development of SES & EASA

SES

- Community approach only way to secure step change
- De-fragmentation & improved performance (driving objective)
  - *Impact on airport capacity*
  - *Environmental objectives*
- Industry involvement & Better regulation will be key
- Involvement of airports in network management
  - *Proposed Network Manager*

EASA

- Logic of extending competences to airports safety…
- … But against one size fits all and prescriptive requirements

Aviation capacity: where are we ?

Airports are the main bottleneck in the system

- 2010-2015: airports are limiting factor on capacity of air transport network

Looming airport capacity crunch

(EUROCONTROL "Challenges to Growth" 2004)

- 2025: +60 airports congested, top 20 airports saturated
- Scenario of maximum achievable capacity!

  - No closure of airports / no capacity limitations

  - Implementation of all existing expansion plans

  - Systematic implementation of best practices
- Real solution: new infrastructure

This is NOT only an airport capacity crunch…

…But an AVIATION SYSTEM CAPACITY CRUNCH

Aviation capacity: where are we ?

Inconsistent / Inadequate EU response

- Capacity in the Sky – ATM: a top priority
  - *SES & SESAR since*
  - *Ambitious objectives: 3 fold movement increase*
- Capacity on the Ground – Airports: not properly addressed
  - *EC Communication 2007*
  - *Does not reflect conclusions of "Challenges to growth"*
  - *Focused on optimising existing capacity*
  - *No recognition of the need to build new infrastructure*

At risk

- Success of SES
- Competitiveness of European aviation

Airport capacity: what are the issues?

For Airports

- Financing growth
  - *Self financing (120 billion € over 2000-2015)*
  - *Decreasing EU funds (1-5% of TENs funding)*
  - *Growing costs (security, construction, environment)*
  - *Inadequate economic regulation*
- Getting the license to grow
  - *Growing environmental pressure*

For the EU

- European interest v. State competence
- Environmental dimension

Airport capacity: expectations

Prerequisites

- EU to reconcile aviation growth and environmental goals
  - *No clear policy direction yet*
  - *High regulatory risk for industry*
  - *Need for coherent and integrated EU strategy*

- Airport capacity to become a priority for EU Transport Policy
  - *Same level of visibility as ATM – SES*

" the HLG has been struck by the mismatch in the attention given at the European level to eliminating capacity bottlenecks in the sky versus bottlenecks on the ground."

  - *Integrated approach: Aviation capacity Enhancement Plan*
  - *Objective: stimulate and incentivize Member States*

Airport capacity: expectations

Looking for solutions…

- Raise the profile of airport capacity
  - *Airport capacity: 4th pillar of upcoming EC SES2 package*
- Follow-up/expansion of existing EC Communication
  - *Clear direction: optimizing existing capacity is not enough*
  - *Stress positive economic impact of airports*
  - *Implementation of an Airport Observatory*
  - *Best practices guidelines on planning and land use*
- Coherent approach
  - *Incentivize airport investment: review of airport charges*
  - *Reconsider EU financing*
  - *slots*

Challenges of the ATMN: A need for additional capacity

SES II: a package with four pillars

1. **Performance framework**
   amending the four SES regulations.
2. **Technology**: endorse the SESAR masterplan
3. **Safety**:
   EASA to cover all links of aviation safety chain
4. **Capacity**:
   tackle capacity in the air and on the ground

Challenges of the ATMN: A need for additional capacity

1. **Performance framework** amending the four SES regulations

   Introducing **performance regulation** on safety, environment, capacity and cost efficiency, with the appropriate incentives and disincentives to drive the change process

Challenges of the ATMN: A need for additional capacity

1. **Performance framework** amending the four SES regulations

   Make our network more performing!

   - Strengthen ANSP governance to become more business oriented
   - Performance Review Body
   - Performance Target Setting for the Network
   - Translate EU targets into national/regional targets
   - Ensure coherence between regional and EU targets
   - Make the system credible

Challenges of the ATMN: A need for additional capacity

4. **Capacity**: towards gate-togate approach
   Integrate capacity management in the air and on the ground

   - Management airport capacity determines ATM capacity
   - Airport capacity action plan
   - Observatory for airport capacity
   - Ensure full interoperability
   - Increase predictability: planning and management in function: **required time of arrival**
   - Allow green flights

Challenges of the ATMN: A need for additional capacity

Timing: SES II package on the table:

- Proposal to amend Single Sky regulations
  Launch co-decision procedure
- Endorsement SESAR masterplan:
  Start JU activities
- Proposal to extend the competence of EASA: Launch co-decision
- Cover all phases of flight - include airport capacity dimension

Challenges of the ATMN: A need for additional capacity

Operational Performance indicators of a stock market driven airport company

Operational Performance indicators of a stock market driven airport company

International Ranking (2007)

	Europe	*Worldwide*
Movements	*2*	*12*
Passengers	*3*	*8*
Cargo	*2*	*7*

Operational Performance indicators of a stock market driven airport company

Annual Report (2007)

	2007	2006	2005	2004
Consolidated Profit for the year (M€)	213,7	228,9	161,5	137,6
Revenues (M€)	2.329,0	2.143,9	2.089,8	1.998,1
EBITDA (M€)	580,5	278,5	542,5	509,6
Employees	30.437	28.246	25.781	24.182

Operational Performance indicators of a stock market driven airport company

Traffic Figures

	2007	2006	2005	2004
Passengers	54.161.859	52.810.683	52.219.412	51.098.271
Movements	492.569	489.406	490.147	477.475
Cargo (t)	2.169.025	2.127.796	1.892.100	1.838.894

Passengers:	Commercial (in + ou t+ transit)
Movements:	total (in + out)
Cargo:	Freight + Mail (in + out)

Operational Performance indicators of a stock market driven airport company

Capacity indicators 2008 (Movements):

Declared Capacity (max.): ***83 – 52 - 44***

(Total - Departures – Arrivals)

Peak Day – Peak hour ***1474 -100***

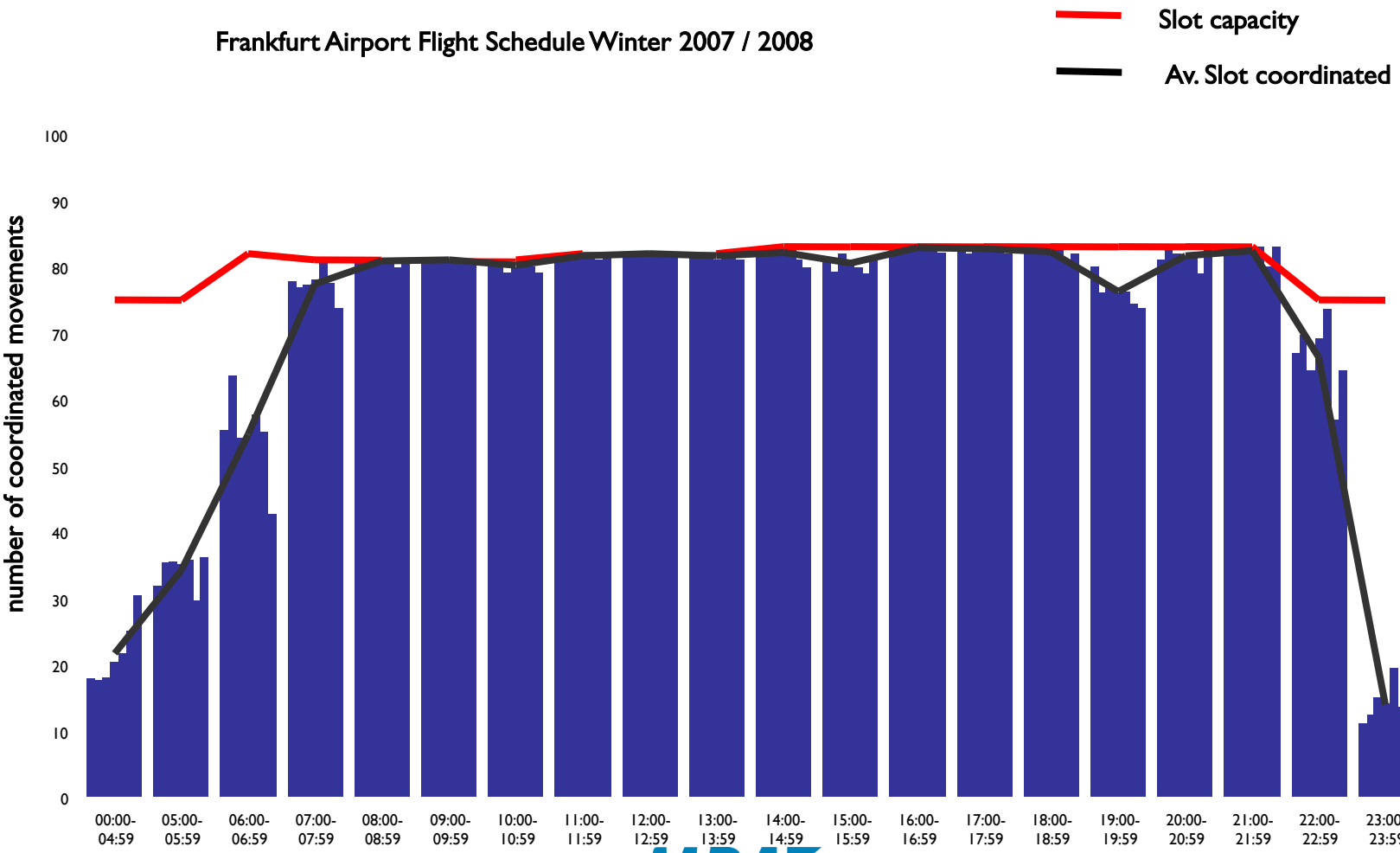
(14.09.2007 – 04.09.2007 16:00 – 16:59)

Typical Peak Day – Typical Peak Hour ***1434 - 93***

29.08.2007 – 31.05.2007 21:00 – 21:59)

Operational Performance indicators of a stock market driven airport company

Demand / Flow / Capacity



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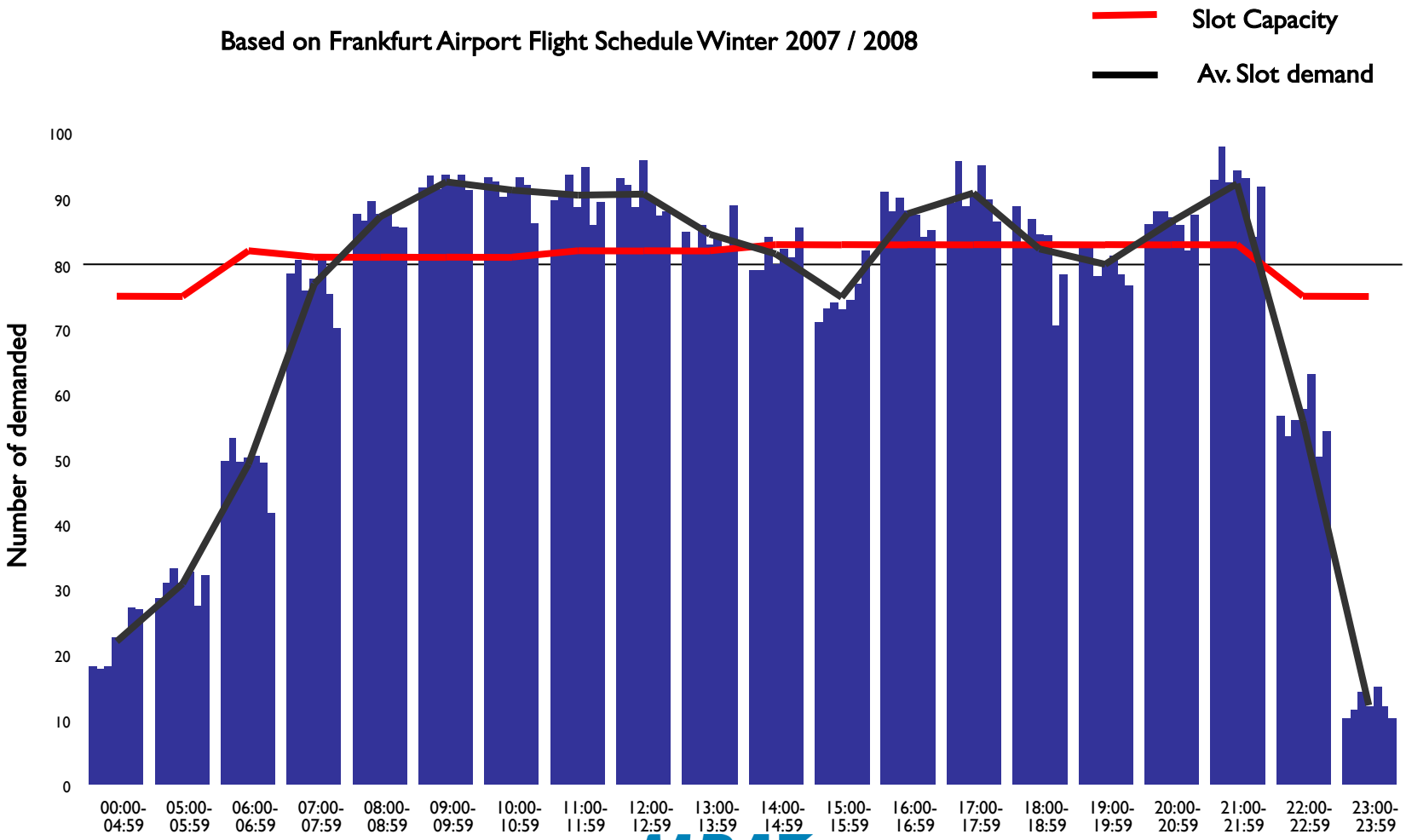
Operational Performance indicators of a stock market driven airport company

Demand / Flow / Capacity



MBA AVIATION MANAGEMENT

Operational Performance indicators of a stock market driven airport company

More indicators (2007) :

Traffic units: ***76.072.429***

(1 Pax or 100kg of Freight or 100kg of mail (in+out+transit) acc. to ACI)

MTOW (t): ***28.240.441***

(Maximum Take-off weight according aircraft license)

Transit-Passengers: ***52,9 %***

Operational Performance indicators of a stock market driven airport company

More indicators (2007) Ø:

Seats per Flight: ***157***

Passengers per Passenger-Flight: ***112,7***

Seat-Loadfactor ***75,8 %***

Wide-bodies ***26,5 %***

Operational Performance indicators of a stock market driven airport company

More indicators (2007):

Baggage served (in+out): ***> 42 Mio.***

– Minimal misrouting of bags: 99.65% reliability
=> **Left behind index**

Failure rate: ***1,7 ‰***

Airlines represented: ***162***

Destinations served: ***307 in 109 Countries***

Operational Performance indicators of a stock market driven airport company

More Figures

	AMS	LHR	CDG	MAD	MUC	FRA
Airport Area (km^2)	27,9	12,0	31,0	12,0	15,0	19,0
Runways	6	2	4	4	2	3
Movements/h	120	120	79	120	90	83

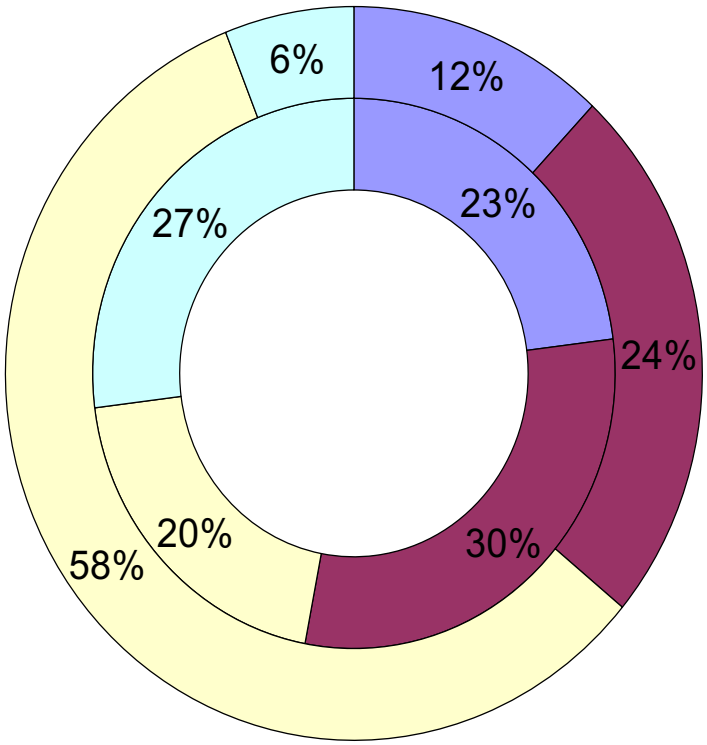
Operational Performance indicators of a stock market driven airport company

Quality Indicators

- *Service Quality*
  Passenger – Cargo - Security
- *Process Quality*
- *Cueing Index*
- ***Punctuality***

Operational Performance indicators of a stock market driven airport company

Business segment analysis



2007: Segments of Revenues (outer) und EBITDA (inner)

- External Activities
- Aviation
- Retail & Properties
- Ground Handling

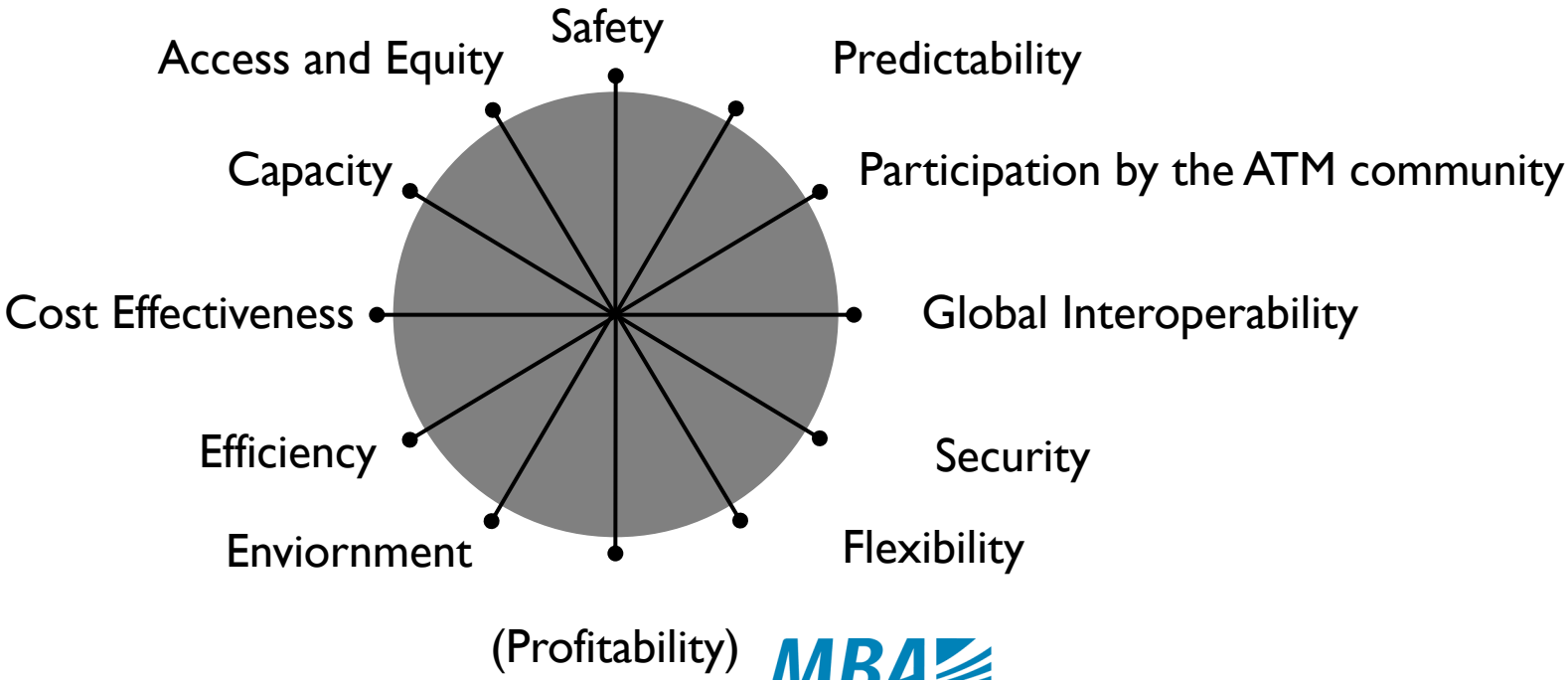
MBA AVIATION MANAGEMENT

Operational Performance indicators of a stock market driven airport company

ICAO Performance Areas

ICAO Global Concept Plan (ATMCP) Doc 9854, 2003

11 Performance Areas for Air Traffic Management (ATM), which can be transferred for the Aviation sector of airports



MBA AVIATION MANAGEMENT

Framework Requirements

- **Complex Regulatory Conditions**

  ICAO, DGCA, Federal Structure, Local Restrictions

- **Various Owner structures**

  Private, Public, PPP, Stock-Market,

- **Various Stakeholders**

  Airport Company, Airlines, Air Navigation Services, Customs, Border Control, Security, Service Providers, Catering, and many more

- **Heterogeneous Infrastructure**

  Runways, Taxiways, Aprons, Terminals, Curbside, intermodal Link Road – Rail, Garages, Retail areas, Fire-Crash and Rescue, Winter Operations, De-icing, Baggage Handling, Security, and many more

Performance Review at Airports

- Performance Targets are heterogeneous and concurring in a target conflict
- the effort to reach the target not only on airport, but off airport is determined by variation in:
  - functional and regional regulation
  - Infrastructure
  - Owner structures
  - Composition and accountability of stakeholders
- Organisational evolution over the time

Performance Review at Airports

Is a serious Performance Review of airports and a wide benchmarking realistic?

No !

However single aspects may be studied

- **Focussing on very few performance targets**
- **classification of airport functions**
- **separate review along a process chain / segment**

Performance Review at Airports

- A Review of the wide and complex system „airport“ would be more subjective than objective.
- It is more than only the perspective to determine:
    - Liberalisation: public or private organisation
    - Central s vs. decentralized Airport-management
    - Human-focussed vs. Human-driven decision systems
- The Network-effect reduces the result perspective in case of a singular airport optimisation
- The Future: trans-organisational Analysis, Prognosis and Process-Optimisation of the Network as a whole

Performance Review at Airports

Study-Case:

As a "unit of productivity" a balance between aggregated Output – variables and aggregated Input – variables may be studied:

- Output: e.g. Number of Passengers, Cargo, Aircraft-Movements, Income of the Non-aviation Business
- Input: Work-Cost, Material, purchased Services (incl. Outsourcing)

Result

- Public owned airports don't show any significant difference to private owned airports
- Publicly dominated Private-Public and/or by several public partners operated airports show significantly inferior efficiency
- Airports with the majority in private hands do have more income out of the Non-aviation Business (e.g. 57% vs. 37%)

Airport Performance

Managing Capacity and Capability

Regulatory impact on airport performance

Regulatory impact on airport performance

Charges

- *Landing and Take-Off Charges*
- *Passenger Charges*
- *Security Charges*
- *Parking Charges*
- *Charges for Central Ground Handling Infrastructure (according to § 6 BADV)*
- *Passenger-related charge for feeding baggage into the hold baggage screening system (security)*

Airport Performance

Managing Capacity and Capability

Does ATM need the airports?

Do airports need ATM?

Lesson learned:

ATM identifies airports as important nodes in the aviation network!

And... however –
the source of delays...

Prejudice:

ANSPs are able to deal with ATM-related problems.

So where is the problem to deal with airport related problems.

The Classical Dilemma

ATC:

The „En-route“ view:

„Aircraft are popping up from the ground, enter „our“ airspace, need to be caressed and treated, handed over and land somewhere else.“

The „Tower“ view:

„Aircraft are handed over to be landed on “our” runway and leave to the apron. Suddenly they appear again and expect to be departed“

The Classical Dilemma

Airport:

„Aircraft are coming out of the clouds, land on „our“ runway, need to be caressed and treated, turned around and depart to somewhere.“

Airline:

“We pick up passengers at an airport, fly them through the airspace, being handed over too many times by too many units and land them at another airport.
For all that **we** are charged....”

Stakeholders

Will ATM be able to deal with hundreds of airports?

- Different organisational structures
- Different economical interest
- Wide variety of size and commercial orientation
- What about Military?

Via States?

How do the regulator does his job?

Stakeholders

Who are the ANSP's?

Who are the „airspace users"?

Who are the „airports"?

„Ownership“ - „Responsibility“

Who “owns” runways?

Who „owns“ slots?

Who is responsible for „capacity“?

Who is responsible for „delays“?

„Circumstances“: Environment and the Neighbourhood

- Political opportune region
- Increasing concern of the people
- Increasing need for information in the surroundings
- The airport comes closer to the segregated housing areas – melting of frontiers.
- Undefined priorities:

  „all noise for some“ vs. „little noise for most“

For instance…

CDM

- Various perspectives of Airlines, ANSP's, Airports.
- What is the role of the ANSP?
  - Service provider?
  - **Safety** is the overall shield!!! No discussion at all!
  - Change of self-understanding: from administration to service provision
  - Service orientation according to customer needs?
  - Importance of reaching capacity goals?
- Regulator?
  - Where is the market for an ANSP?
  - Who is dedicating contracts to whom?
  - What about the National law?

For instance...

CDM

Who is setting up the scene for CDM?

Is it a local solution concerning the stakeholders at the entire airport?

Or

is it an international solution connecting the stakeholders together and combining different locations?

Go for the gate-to-gate concept.

But: Who will be the pacemaker?

Framework

- Where is the regulatory framework for the future?
- The money is available at the **airports**:
- Evolution from an infrastructure for the provision of aviation to an enterprise earning money.
  Caution: Shareholder value!
  Every "passenger" is a "customer": -> Retailing!
- The know-how is available in industry and science.

But:

- Where are the standards and recommended practices?

Customer orientation

- How does an airport appear in public?

- An airport is a complex structure not transparent to the customer = passenger.
- Complaints are „non-directional“: not directly assigned to any participant.
- Practically airports are a common domain address „The airport“, because the public is definitely unable to differentiate between ATC / Airport and Airline business.

- Challenge for the collaborative solution:
- Carry the burden collaboratively!
- Improve the image of aviation collaboratively!
- Don’t blame the internal partner in public!

Market Challenge

Airspace

- interpretations of sovereignty
  => high rate of interfaces and complex co-ordination necessities
- Continuous increase of air traffic
- Managing of delays
- Reaching the capacity limits
- Multiple co-ordination between civil and military units

Challenge for the future:

- Development of a unique overall airspace structure
- Development of the Gate to Gate idea

Conclusions:

Capabilities:

- Interaction / Co-operation / Integration / Collaboration
- use available experiences without any kind of „resentment“

Constraints:

- Sub-optimal use of available capacity due to „Ego”- oriented interests
- Focus on money (=> industry)
- What is technically possible is not in all cases of an operational benefit.

Needs:

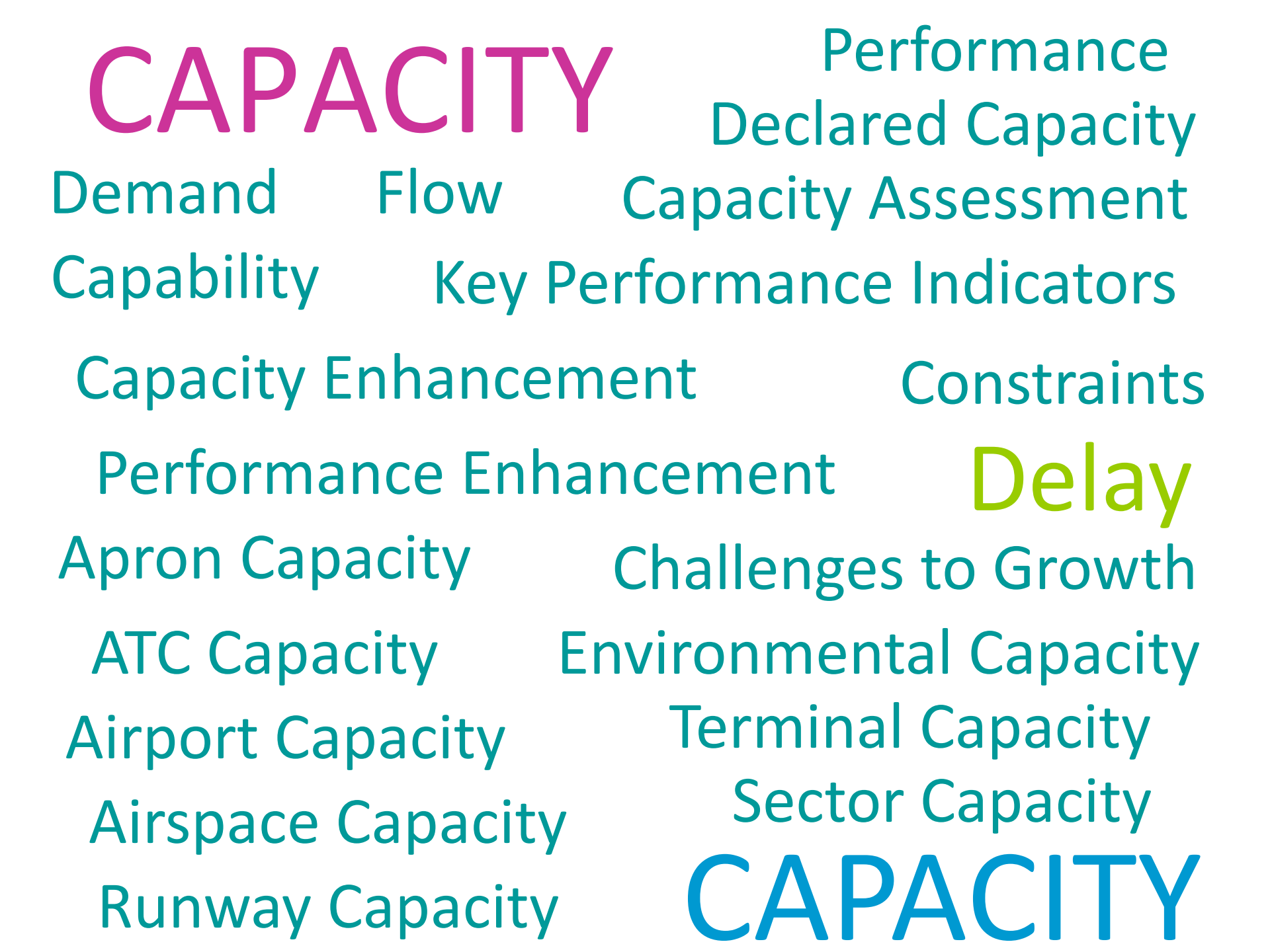
- Flexible reaction to pre-planned processes
- Paradigm Change: Farewell to „first come / first serve“ – Hello to „first planned / first served“

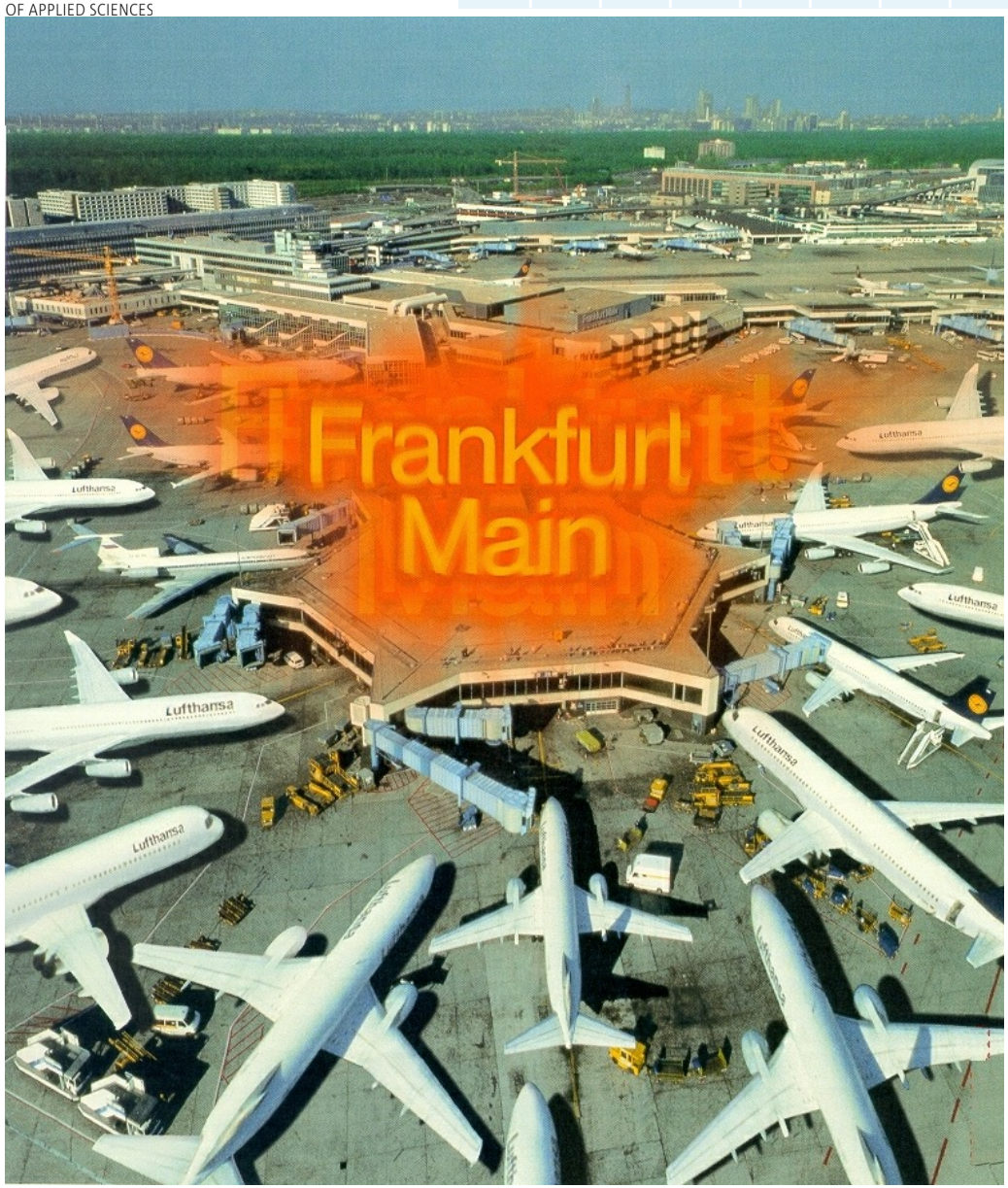
Evolve a change of the attitude:

- Migrate from Air Traffic Control to Air Traffic Management
- Train „Controllers“ to become „Managers“
- Train Pilots and Controllers to understand each other
- Make them aware of the need to follow instructions accurately and immediately
- For the effect of planning and managing air traffic there is a decreasing space of interpretation
- Make use of highly sophisticated planning and advisory tools.
- Convince controllers to make best use of supporting systems

Think positive!

- Concentrate on the collaborative approach of development
- Increase the effort in establishing a collaborative position in public.
- Increase the effort in the continuous involvement of all the stakeholders.
- Develop measures for the continuous strategic awareness of all stakeholders
- Increase the investment in the high level approach to the management of airports to assure the active contribution in ATM projects.
- Increase the effort in the establishment of a regulatory framework


CAPACITY
Performance
Declared Capacity
Demand
Flow
Capacity Assessment
Capability
Key Performance Indicators
Capacity Enhancement
Constraints
Performance Enhancement
Delay
Apron Capacity
Challenges to Growth
ATC Capacity
Environmental Capacity
Airport Capacity
Terminal Capacity
Sector Capacity
Airspace Capacity
Runway Capacity
CAPACITY



Any Questions?

Thanks

For your attention!