A VIEW INSIDE ÖBB’s ASSET MANAGEMENT SYSTEM

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Are you familiar with the following situation?
Todays real-life scenario: The asset owner comes with a request...

What if ...?

Difficult question...
Luckily we have a lot of experience!

Asset Owner  Asset Manager  Employees
Todays real-life scenario:
...the asset manager forwards the request to it’s employees
Todays real-life scenario:
… many answers worked out by all the experts
Todays real-life scenario:
… the asset manager responds with a brief summary

Well, the answer to your question is…
...the scenario we were confronted with in 2014...
Who we are

- 4.846 km of track
- 13.760 switches
- 6.327 bridges
- 246 tunnels
- 3.398 level crossings
- 1.095 stations
- 8 terminals
- Investments of € 2 billion per year

Semmering base tunnel
- Speed up to 230 km/h
- 27 km long
- Status: under construction
- Start of Service: 2026

Brenner base tunnel
- Joint project with Italy
- 64 km long railway tunnel
- Status: under construction
- Start of Service: 2026

Koralm railway
- 130 km new railway lines
- 33 km long Koralm tunnel
- 12 new Stations
- Status: under construction
- Start of Service: 2024
WHY?  HOW?  BENEFIT?
two questions: „what if...?“ and „what will happen then...?“
Asset Management - what is it and why do we need it?

Managing costs, performance, and risk results in value from assets.
Asset Management supported by an Asset Management System

- **Managing**
  - costs
  - performance
  - balance
  - risk

- **results in**
  - maximum value from assets

- **Asset Management System** supports
  - decision making criteria (ISO 55000 - decision making criteria)
  - strategic factor (timely commissioning)
HOW?
The journey towards our asset management system

WHAT?

detailed route description
Our Asset Management approach simplified depicted as a process
At the beginning of each journey you have to define your objectives

- Objectives
- Actual situation
- Identify Δ
- Strategy
- Implementation
Objectives of our stakeholders

- increase modal-split (shift to rail)
- reduce CO₂ emissions
- enable easy access to railway
- …
Network Objectives

network objectives
- derived from and aligned with internal and external stakeholder-needs

target network
- Our long term rail network master-plan
We defined SMART objectives with our stakeholders

SMART-objectives

» increase modal-split by 8% in rail freight by 2030
» reduce 320 tsd. t. CO₂ emissions per year
» Provide accessibility for 90% of our passengers by 2025
» 2000 parking spaces per year

to large objectives
Breaking down network objectives to...

route objectives

Example: reduction of travel time

- By 2025 we want to have a travel time between Vienna and Graz of less than 2 hours
- This objective needs to be broken down to the route, as the measures need to be implemented on the route.

asset objectives

Example: accessibility

- By 2025 we want to provide accessibility for 90% of our passengers.
- As an infrastructure manager we need to ask ourselves „What are the stations where we will serve 90% of our passengers in 2025?”
Prioritization of routes based on actual traffic and traffic forecast 2025+

Segmentation of the network based on following criteria for the prioritization of measures (maintenance, invest,…):

- Stations
  - Number of passengers
- Route:
  - Number of trains (timetable)
  - Hubs
  - Entry points with significant change of train numbers (e.g. industrial siding)
  - Stations with significant change of train numbers (start and end segment)
  - Borders or end segments of the Austrian network
  - …
Network Development Plan (NDP) structured in 3 parts with 10 chapters

Part A: Development plan – from actual to target
- Foundations
- Overarching objectives
- Market & Potentials in passenger transport
- Market & Potentials in freight transport
- Train services at the time xxxx
- Rail infrastructure at the time xxxx
- Effect evaluation

Part B: Strategy – steps towards the goal
- Initiatives and programs
- Asset strategies

Part C: From the network to the route
- Route definitions, classifications and profiles
Our Asset Management approach simplified depicted as a process

- **Objectives**
- **Identify Δ**
- **Implementation**

**SMART**
- controllable
- target network 2025+
- network development plan
Unambiguous, unique Asset Information

actual situation

Asset information

- Number and type of switches, geographical location
- km of track
- Number of stations
- Number and type of signals
- Performance

multiple sources, inconsistent data
One Asset Information System (AIS) to rule them all

**Component Model**
- Unique, unambiguous Components, subcomponents

**Data Governance/Data Cleansing**
- Processes and methods to increase data quality

**Status Administration**
- Cross-sectoral State administration

**Visualisation**
- The assets are visualised along the routes

**Geometric Model**
- True position and length based on geodetic survey points

**Historicisation**
- Along the entire Life-cycle including past and future

**Net-model (Route- & Track-net)**

**Pointer model**
- Joining data of one and the same component from different sources.
What is the actual performance of our assets and how can we determine it?
How to describe the performance of an asset?

- Safety
- Functionality
- Compliance
- Availability
- Substance
Methodology of the network performance report

» Presentation of the actual network performance (asset, route, network)

» Recognition of trends

» Derivation of maintenance and reinvestment funds
Our Asset Management approach simplified depicted as a process

- unambiguous data
- perf. measurement

- Asset Information System
- performance report

- objectives
- identify ∆
- implementation

- actual situation
- strategy
Comparing actual performance with target performance

Asset comparison
- actual substance
- target substance
- actual performance
- ...

identify Δ

comparability
Measure the predefined performance indicators

actual performance

target performance

consider performance indicators during objectives definition
Our Asset Management approach depicted in a process

- objectives
- identify Δ
- strategy
- implementation
- comparability
- network development plan
Strategy development

Options to reach the objectives

- Option 1
- Option 2
- Option 3
- ...

objective decision-making criteria
We want to develop the most efficient strategy to achieve the objectives
Strategy development process

Elicitation-phase

Analysis-phase

Options-phase

Assessment-phase

adopt objectives based on selected strategy

Elicitation Gate
- SMART Objectives defined
- relevant Stakeholder determined
- requirements elicited
and documented
- field of action defined

Analysis Gate
- requirements analysed
and tested for plausibility
- inconsistencies detected
- cost-drivers located

Options Gate
- measures defined
- feasibility checked
- strategy conformity assured

Assessment Gate
- cost-benefit analysis created
- measure prioritised

effect simulation tool
Route Development Plan (RDP) structured in 5 Chapters

Objectives and strategies of a single route

Management Summary

Fundamentals
- Facts and figures | route description

Development Plan – from actual to target
- Route objectives
- Potentials in passenger/goods transportation
- Number of trains
- Target traffic offer
- Target performance route/station
- Objectives: Safety, efficiency, condition, functionality, availability, compliance
- Impact assessment

Measures to achieve the objectives

Graphic depictions target route/station
Our Asset Management approach simplified depicted as a process

- Unambiguous data
- Objectives
- SMART
- Controllable
- Performance measurement
- Asset Information System
- Performance report
- Actual situation
- Identify Δ
- Network development plan
- Comparability
- Strategy
- Variant evaluation
- Effect simulation
- Implementation
Desired future scenario:
The asset owner comes with a request…

What if ...?

Difficult question… Luckily we are well prepared due to our AMS!

Asset Owner

Asset Manager

AM Expert

Employees
Desired future scenario:
… which he forwards to it’s AM Expert
Desired future scenario:

... very soon the AM Expert returns a well reasoned response due to its AMS

Well, based on the adopted objectives and the actual situation, we suggest to follow the worked out strategy. Our simulation clearly shows that this gives us the opportunity to increase performance by 7 points without exceeding our budget.
Desired future scenario:
... the asset manager responds with a brief summary

Well, the answer to your question is, that based on the adopted objectives and the actual-situation, we suggest to follow the worked out strategy, as our simulation clearly shows that this gives us the opportunity to increase performance by 7 points without exceeding our budget.
Desired future scenario:

…and gets a sincere appreciation from the Asset Owner

Thank you for such a comprehensive response. I am impressed that you were able to work that out in such a short period of time. It is always a pleasure working with you!
BENEFIT?
the right asset
at the right place
at the right time

...thank you