Asset management a complex tool for railway infrastructure companies restructuring

Business case: CFR-Romanian Railway

Dan M. Costescu
CFR Network

Network length: 10,629 km
Double line: 2,909 km
Electrified line: 4,028 km
Number of stations: 915
## CFR Network - extended

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network length</td>
<td>10.628 km</td>
</tr>
<tr>
<td>Total network length</td>
<td>19.850 km</td>
</tr>
<tr>
<td>Double line</td>
<td>2.917 km</td>
</tr>
<tr>
<td>Simple line</td>
<td>7.711 km</td>
</tr>
<tr>
<td>Electrified line</td>
<td>4.030 km</td>
</tr>
<tr>
<td>Non-electrified line</td>
<td>6.598 km</td>
</tr>
<tr>
<td>Number of stations</td>
<td>917</td>
</tr>
<tr>
<td>Electronic interlocking systems</td>
<td>40</td>
</tr>
<tr>
<td>Electrodynamic interlocking systems with computerized control station</td>
<td>15</td>
</tr>
<tr>
<td>Electrodynamic interlocking systems</td>
<td>578</td>
</tr>
<tr>
<td>Electromechanical interlocking installations</td>
<td>60</td>
</tr>
<tr>
<td>Marshalling hump mechanization and automation installations</td>
<td>18</td>
</tr>
<tr>
<td>Installations without interlocking</td>
<td>318</td>
</tr>
<tr>
<td>Automatic block signals</td>
<td>963</td>
</tr>
<tr>
<td>Automatic barriers</td>
<td>1.094</td>
</tr>
<tr>
<td>Number of tunnels</td>
<td>171</td>
</tr>
<tr>
<td>Length of tunnels</td>
<td>62 km</td>
</tr>
<tr>
<td>Number of bridges and culverts</td>
<td>17.694</td>
</tr>
<tr>
<td>European gauge</td>
<td>1.435 mm</td>
</tr>
<tr>
<td>Wide gauge</td>
<td>1.520 mm</td>
</tr>
<tr>
<td>Length of the optical fibre network</td>
<td></td>
</tr>
<tr>
<td>Length of interoperable km network</td>
<td>6.522 km</td>
</tr>
<tr>
<td>Length of non-interoperable network</td>
<td>3.754 km</td>
</tr>
<tr>
<td>Length of the public infrastructure managed by CFR</td>
<td>10.622 km</td>
</tr>
<tr>
<td>Length of the private infrastructure of CFR</td>
<td>6 km</td>
</tr>
</tbody>
</table>
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CFR - Organization & Context

National administrator – running a natural rail infrastructure monopoly

Company under authority of Transport Ministry

Grants access to infrastructure for 30 railway undertakings acting on an intra-modal market liberalized since 1998

Beneficiary of insufficient funds for infrastructure renewal and maintenance

The stakeholders expect improved services for direct and indirect clients able to generate market share re-gain
Due to continuous degradation of rail infrastructure and related services a new management has been appointed in 2015 at CFR. The immediately assumed restructuring process was based on five pillars:

1. Re-alignment of asset to the core business
2. Re-organizing the liabilities
3. Re-shaping the workforce
4. Re-build The management
5. Re-adjust the strategy
Translate Strategy into Actions

- Identified necessary information
- Settled data collection and repositories methods
- Performed sectorial analysis
- Developed the new management architecture
- Established priorities
- Make clear the transition process
Asset Management System Elements:
Leadership/Communication /Planning/ Support/ Evaluation

- Created the Vision in 3 month and delivered it as Management Plan
- Ensured the appropriate resources are in place for implementation
- Promoted/communicated directly and indirectly the Strategic Goals/Tactical Plan/Actions List inside and outside organization
- Recognized and handled conflict between the internal culture and AMS concept

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### Asset Management System Elements:
Leadership/Communication/ **Planning** /Support/ Evaluation

### Planning

- Linked asset reports to financial reports (convert the technical & operational data into analytic/synthetic financial accounts)
- Established the flow-chart of information, and distribution to the different management levels
- Designed the Reporting Templates according to the KPI’s
- Aggregated the Reports, Deviation Limits and Corrective Actions into the Control Dashboard of Top Management
Asset Management System Elements:
Leadership/Communication/Planning/Support/Evaluation

- Remodelled the organization to better share resources
- Implemented the critical function of AMS creating, controlling and documenting of information
- Improved cooperation between different departments first of all by granting access to the same information over the system
Asset Management System Elements:
Communication/Planning/Support/Performance Evaluation

What to evaluate?
Performance of asset, asset management and asset management system

Which methods?
Reports typology includes performance measurements oriented on direct or indirect methods, financial or non financial

When to measure?
Due to digitalization the audit can migrate from a periodic to a continuous audit

When to analyze and evaluate?
As data is instantaneously available either of periodical, self- or automatic assessment is available
Improved KPI’s

- Enhanced efficiency and effectiveness
- Improved organizational sustainability
- Improved services
- Properly handled risk
- Improved financial performance
- Informed asset investment decisions
- Demonstrated compliance
- Enhanced reputation
- Demonstrated social responsibility
Software environment IRIS-MP5i

- 45 Sections L, 23 Sections CT, 23 Sections
- Power Supply-PS, 8 SIMC
- Divisions L, CT, Stations, Power Supply, TC Zones
- 2200 Users
STANDARD MODULES of IRIS MP5

• **ASSET MANAGEMENT** – Infrastructure elements and related attributes (Data structures)

• **WORK MANAGEMENT** – Scheduled or occasional maintenance and associated costs, including

• **SCHEDULING WORK** – Workforce management by different types of operation and services

• **MATERIALS MANAGEMENT** – Stocks and spare parts

• **PURCHASING MANAGEMENT** – Procurement of supplies and spare parts
CUSTOMISED MODULES of IRIS MP5

- Operational management of disruption
- Operational management of track switches works
- Management of special risk areas
- Waste management
- Management of speed limitation and closed tracks
- Management of provisional bridges and cross beams
- Management of heavy equipment works on track
- Customised reports
实施的模块

- 铁轨
  - 高度限制
  - 特殊风险区域
  - 封闭的轨道

- 资产
  - 基础设施要素

- 工作
  - 重型设备工作
  - 每两周服务
  - 移动实验室数据集生成
  - 定制/按需报告

- 弗朗西斯科·德·科斯特斯

www.railway-asset-management.org
Asset and related attributes (Saligny Bridge)
Asset Management

Better decisions through the asset lifecycle enable the company achieve multiple business outcomes

- Improved investment planning
- Sustainably reduce whole life cost of renewing and maintaining assets
- Meet the demands of customers, regulators and shareholders
- More effective use of existing infrastructure
- Improve the availability of assets
- Safety risk modelling to reliably identify critical assets
- Analysis of operational safety-related risk precursors
- Meet regulatory obligations to avoid penalties
- Evidence to support regulator negotiations

Source: Capgemini – "Asset Management" presentation
Restructuring actions:

**PRIME**
**PRogram INtern de CEntralizare**
(Internal Programme for Interlocking)

**Situation before:**

- 395 stations non-interlocked
- represent 38% of the total network assets in stations
- include 5,200 employees (23% of the total number)
- lower traffic than on the main lines
- generate the traffic for the main lines
- important to the local communities
Restructuring actions:

Action: Install interlocking by using the components recovered from the TEN-T corridors

- 4x reduced price comparing to new equipment: €5-600,000/station
- Return of investment period: 5.5 years
- Staff savings: 67% or more
- Reduced annual investment effort by redistributing it over 4 years
- Gradually generation of savings, starting the second year
- Release personnel for other departments in need
Restructuring actions:

**STAGES FOR INCREASING THE EFFICIENCY OF THE ACTIVITY**

<table>
<thead>
<tr>
<th>Year 2015</th>
<th>Actions for increasing the efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stage 1 - increasing of the efficiency on short term</td>
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<tr>
<td>Result</td>
<td>Action</td>
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<table>
<thead>
<tr>
<th>Tracks Directorate</th>
<th>keeping-on</th>
<th>Tracks Directorate</th>
<th>keeping-on</th>
<th>Tracks Directorate</th>
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<tbody>
<tr>
<td>35 employees</td>
<td>35 employees</td>
<td>35 employees</td>
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<table>
<thead>
<tr>
<th>TRACKS DIVISIONS</th>
<th>keeping-on</th>
<th>TRACKS DIVISIONS</th>
<th>keeping-on</th>
<th>TRACKS DIVISIONS</th>
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</thead>
<tbody>
<tr>
<td>8 regional structures with 25 employees</td>
<td>8 regional structures with 25 employees</td>
<td>8 regional structures with 25 employees</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>TRACKS SECTIONS</th>
<th>keeping-on</th>
<th>TRACKS SECTIONS</th>
<th>keeping-on</th>
<th>TRACKS SECTIONS</th>
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</thead>
<tbody>
<tr>
<td>45 structures</td>
<td>45 structures</td>
<td>45 structures</td>
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</table>

<table>
<thead>
<tr>
<th>DISTRICTS out of which</th>
<th>DISTRICTS out of which</th>
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<table>
<thead>
<tr>
<th>309 Tracks Districts</th>
<th>Uniformization of the district structure</th>
<th>295 Tracks Districts</th>
<th>Merging of districts and setting-up of LIW, after providing with mechanization logistics for track intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>155 Tracks Inspection Workshops (LIW)</td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>52 bridge districts</th>
<th>45 bridge districts</th>
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</table>

<table>
<thead>
<tr>
<th>56 machine operating districts</th>
<th>45 machine operating districts</th>
</tr>
</thead>
</table>

**Result**

**Stage 2 - increasing of the efficiency on medium term**

**Result**

**Stage 2 - increasing of the efficiency on medium term**

**Result**
Restructuring actions:

**Situation before (risks analysis):**

- Lack of involvement of CFR in the early stage of asset project development
- Poor control of design/technology for construction
- Poor control of technology/procedure for maintenance after completing investment

**Action:** Establishment of an own Development Department able to approach asset design over its entire life-cycle.
Restructuring actions: Maintenance/Renewal

Situation before (Risks):

Poor control over assets during their middle age because:

- Maintenance directorate was uninspired divested years ago
- Company lost completely capacity for assets renewal
- Purchasing regulation is inappropriate for emergent renewal needs, making the tendering very tedious and time consuming

Action 1: Merging with Maintenance Company
Action 2: Establishment of a mobile unit for renewal of network
Restructuring actions: Monitoring function

**Situation before (Risks):**

Poor control over assets during their construction/renewal because:

- Insufficient work supervision function during investment works done by contractors
- Delays in implementation, associated costs, claims from litigation
- Inappropriate assignment of monitoring staff to the headquarter of the company

**Action:** Establish of local monitoring teams assigned to the regional on-going investment sites
Thank you for your attention!

Dan M. Costescu