Proactive & Predictive Waterfront Asset Management

Port of Rotterdam Experience

Henk Voogt, Asset Manager, Port of Rotterdam
Deterioration of Infrastructure Assets

Nothing lasts forever…

- Deferred maintenance costs
- Inadequate capital allocation
- Run-to-failure repair & maintenance programs
- Inspections based on random observations
- Loss of competitive edge and productivity
- Safety/security concerns
Asset Management - A Strategic Imperative

Waterfront structures like quays, jetties and wharves are the pivot of the business case.

Income of the Port depends on the availability of the asset.

Loss of profit will decrease cash flow and thus the opportunity to invest in the future.

Disruption to the tenant’s business is the most unwanted situation.
More intensive use of assets
Expansion for larger ships
Justification of maintenance plan to board of directors
Extension of tenant leases

But what do we focus on first?

Asset Management - More Challenges
Asset Management Maturity

**Innocence**
- Repairs are as good as before
- Reactive – fix it when it breaks
- Struggling with management systems

**Awareness**
- Systems are a valuable tool – information as an asset
- COSTS GO DOWN
- MAINTENANCE IS AN EXPENSE

**Understanding**
- Repairs are as good as NEW
- Proactive predictive maintenance

**Competence**
- Maintenance is part of the supply chain
- Optimized decision-making
- Focus is on lifecycle & reliability

**Excellence**
- Attitude shift from cost focus to value focus
- MAINTENANCE IS AN INVESTMENT
- WHILE VALUE & PERFORMANCE INCREASE
Four (4) Main Elements for a Good Asset Management Foundation

- **Master Data**
  - How many assets?
  - Are dimensions known?
  - Are specs and drawings available?
  - Etc.

- **Risk Analyses**
  - Assets must be available for service to its tenants
  - What phenomena can endanger the asset’s functionality?

- **Processes**
  - Process must be well documented and implemented to ensure efficient management of assets

- **Business Value**
  - Multi-criteria calculated figure that represents how much an asset contributes to the goals of the organization
Main Elements for a Good Asset Management Organisation

- ERP
- DMS
- GIS
What is our Direction – Now and in the Future?

- Once the baseline/foundation is in place, the following questions still need to be answered:
  - How safe is the structure?
  - What does it mean for the tenants?
  - How do we prioritize?
  - What is the best time to intervene?

- The self-evident facts to have in mind are:
  - Cutting costs will directly impact the long-term performance of an asset.
  - The condition determines the availability of an asset, not its age.
From Model to KMS

- Port of Rotterdam developed in partnership an asset management tool called KMS, that:
  - Uses the results of *deterioration models for concrete and steel* and compares it with the “end of contract” date
  - Identifies and ranks *the risks* that endanger the functionalities of the structure
  - Uses *the business value* of a quay wall to clarify its maintenance priority
Benefits

▪ Transparency in the annual budget for maintenance
▪ Reliable assessment of the performance and residual service life of marine structures
▪ High-precision data to help extend the service life
▪ Insight into the costs associated to maintenance and repairs of concrete and steel
▪ Helps to effectively plan the maintenance program of port infrastructure which represents significant savings for owners from reduced commercial inactivity related to repairs, maintenance and construction
▪ Just-in-time inspections – not too early or not too late (reducing inspection costs and/or needed resources)
Return on Investment (ROI)

With More than 70 KM of Quay Walls…

An Estimated 2.1 Million Euros in Savings Between Inspections
## Asset Management Program: Stepstones

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Document the assets owned and managed</th>
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<tbody>
<tr>
<td>Step 2</td>
<td>Understand the current condition of the assets</td>
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<td>Step 3</td>
<td>Understand what budget is needed to catch up, keep up and move forward</td>
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<td>Step 4</td>
<td>Understand what endangers the functionality: risk analysis</td>
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<td>Step 5</td>
<td>Understand the business value, what the contribution of an asset to the business goals</td>
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<td>Step 6</td>
<td>Establish the level of service for an asset and calculate the cost of service</td>
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<td>Step 7</td>
<td>Prioritize the needed budget based on risk and business value</td>
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Wrap up & Conclusion

- Building an asset management organization from zero base to going concern in .. year(s) ?
  - Start small and grow,
  - Start with your one million dollar quay wall
  - Knowledge and Expertise is in the house
  - Getting AM in the hearts and minds, tell the story
  - On top of daily work
  - Don’t under estimate project management
Port of Rotterdam - KMS

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A STRATEGIC IMPERATIVE FOR THE PORT OF ROTTERDAM

Contact:
Henk Voogt, h.voogt@portofrotterdam.com