Waterfront Infrastructure Management
A Tool For Our Times

A look at the options available for supporting efficient stewardship of our nation's port infrastructure.
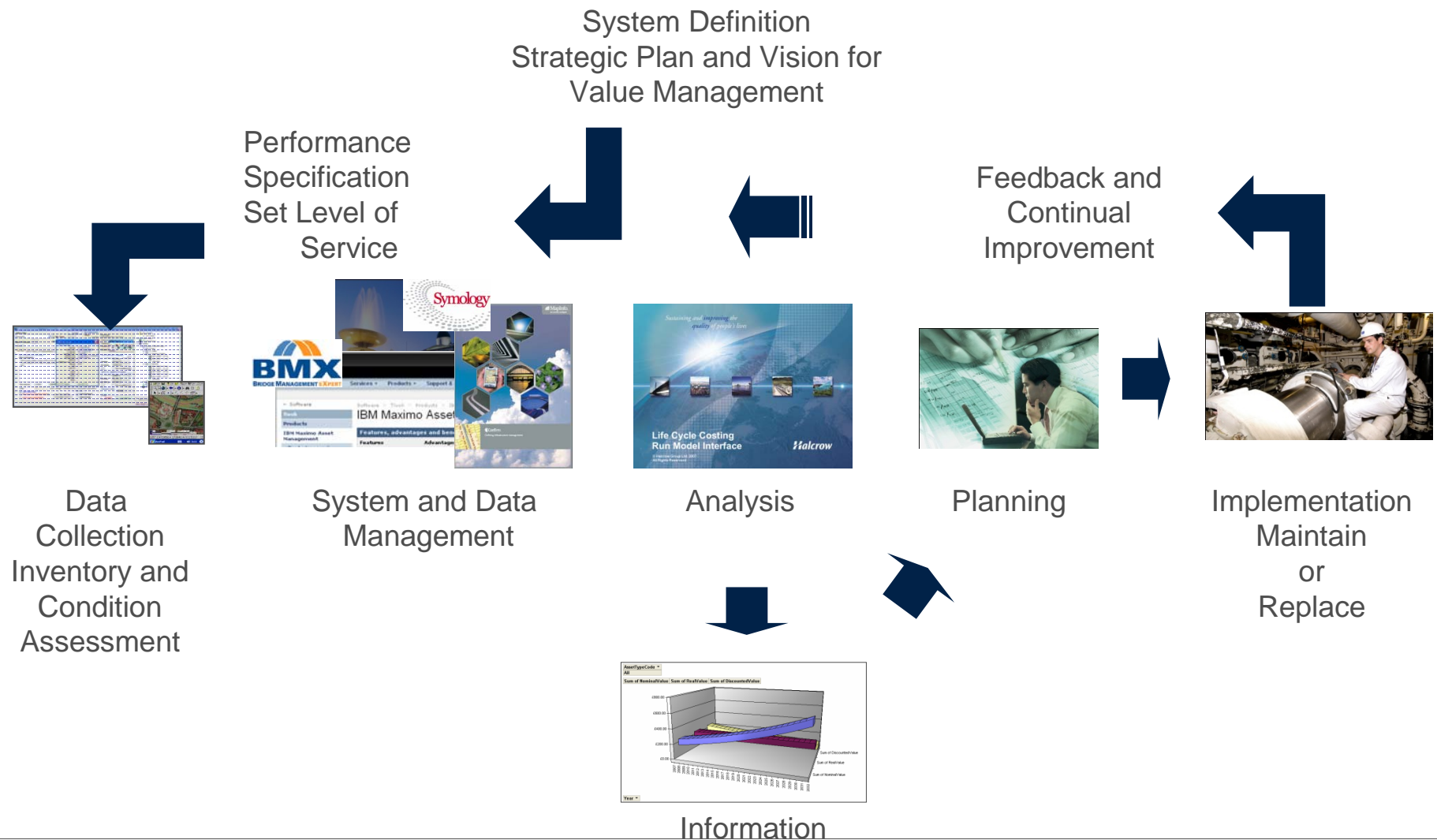
Outline

- Introduction and context
- System overview
- System components
- Lessons learned and best practices
- Case study

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Introduction and Context

- 'The systematic and coordinated activities and practices through which an organization *optimally* manages its physical assets, and their associated performance, risks and expenditures over their lifecycle for the purpose of achieving its organizational strategic plan'.

- Decision-making at each stage of the life cycle
- Converting data into information
- Minimize cost
- Maximize productivity
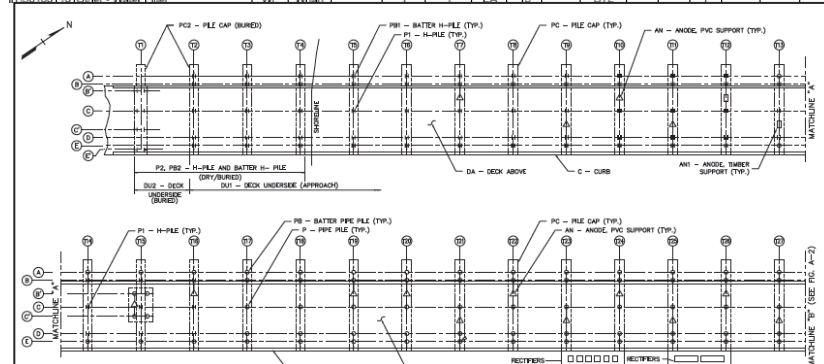
- Objective, defensible framework

System Overview

System Definition
Strategic Plan and Vision for
Value Management

Performance
Specification
Set Level of
Service

Feedback and
Continual
Improvement

Data
Collection
Inventory and
Condition
Assessment

System and Data
Management

Analysis

Planning

Implementation
Maintain
or
Replace

Information

System Components

System Components - Inventory

- ASTM Uniformat II
  - Currently in draft format
  - Waterfront element-specific classification
- Simultaneous cataloging and hierarchy development
- Enables querying and consistent economic evaluation

- "DNA" of the system

- Can be spreadsheet-based
- Desktop study, field verification, or combination

System Components – Condition Assessment

- Output provides data on the health of the inventory

- Key to updating management plans

11-18-2009   Kirk Riden – Halcrow / Michael Russalesi – Synergy Software
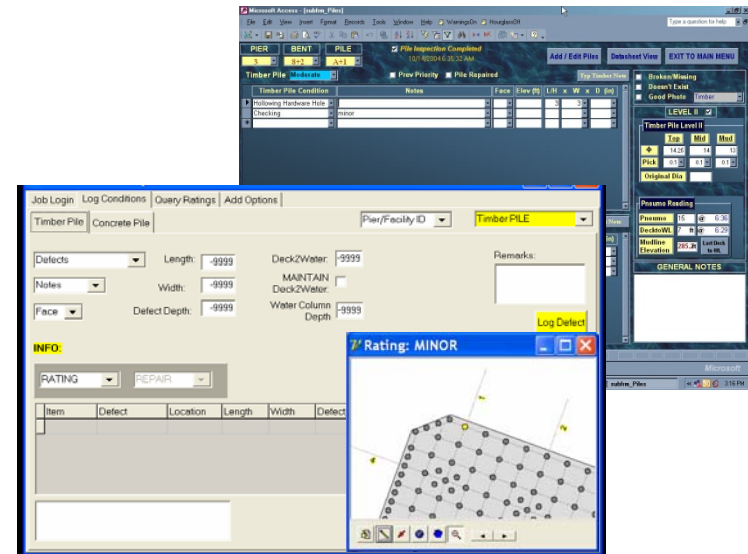
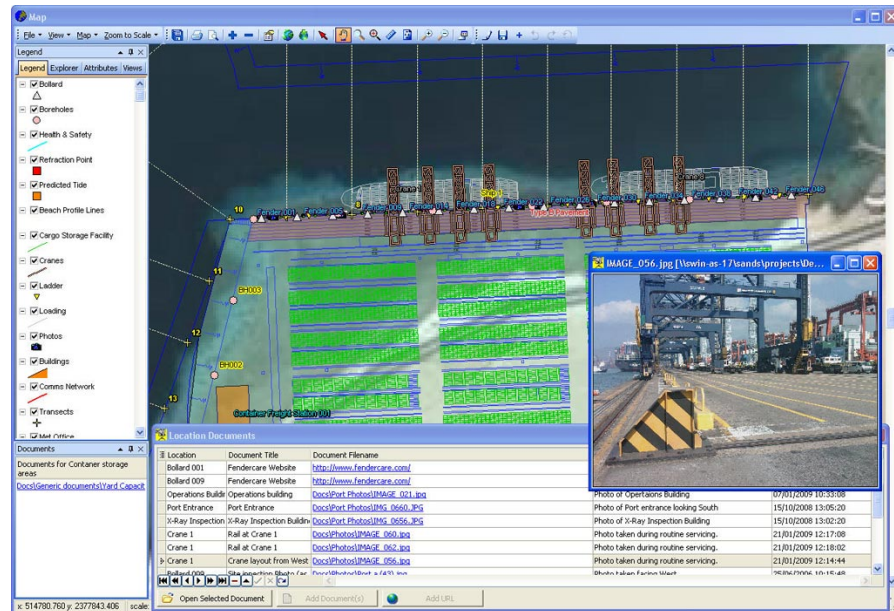# System Components – Management Plan

- Key long-term strategy document containing:
    - Asset make-up (built from inventory elements), location, construction costs, and life span
    - Capital maintenance:
        - Tasks, intervals, pricing
    - Operating & maintenance:
        - Tasks, intervals, pricing
    - Risk profile
    - Criticality

- Feeds life-cycle cost model
- Can be spreadsheet-based

System Components – Data Management

- User interface / electronic filing cabinet
- Dashboard and map to data
- Can be GIS-enabled

- Point-and-click access to:
  - Drawings and specifications
  - O&M manuals
  - Photographs
  - Bid packages
  - Tidal data

- Useful tool for visualization
- Commercially-available GIS and database tools

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System Components – Data Management

- Operations
  - Capacity analysis
  - Lease management
  - Health and safety recordkeeping
  - Dredge management
  - Maintenance and inspection scheduling
  - Automated report generation
  - 3D planning
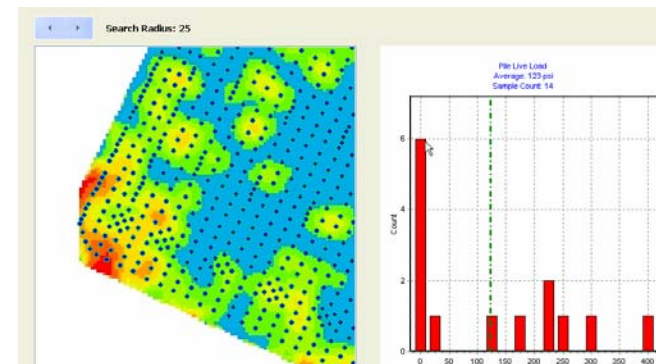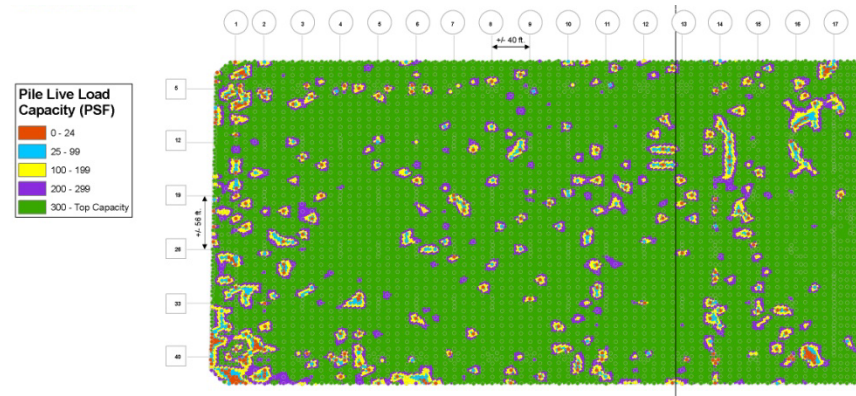
System Components – Analytics

- Converting data into information

- Repair program definition
  - Rapid generation of extent of repair based on varying structural requirements OR varying resource availability
- Querying for inventory-wide trends and spends
- Time-history analysis of channel accretion/erosion
- Materials technology
  - Service life prediction
  - Cathodic protection
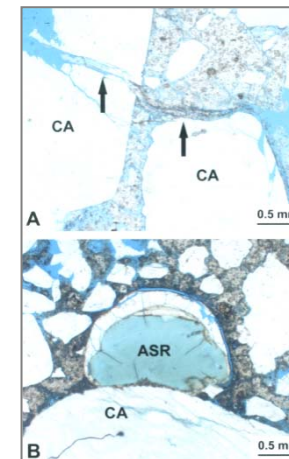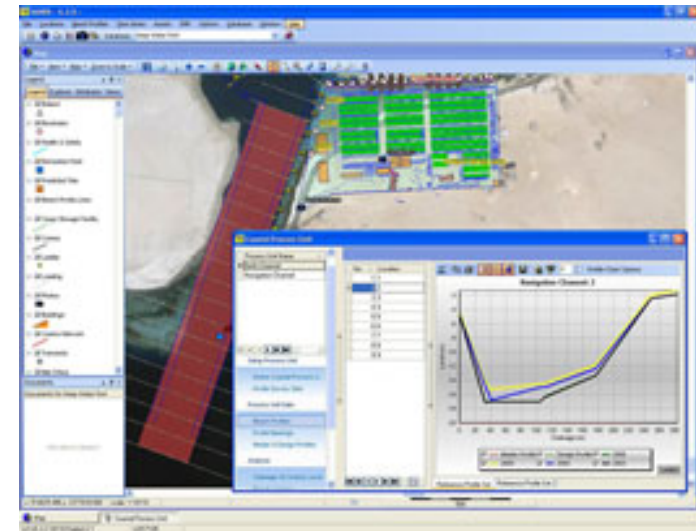
System Components – Analytics

- Bringing it all together

- Life-cycle cost model
  - Allows for 'what-if' scenario analysis
  - Price risk of deferred maintenance
  - Develop long-term expenditure plan
  - Enables prioritization of capital projects

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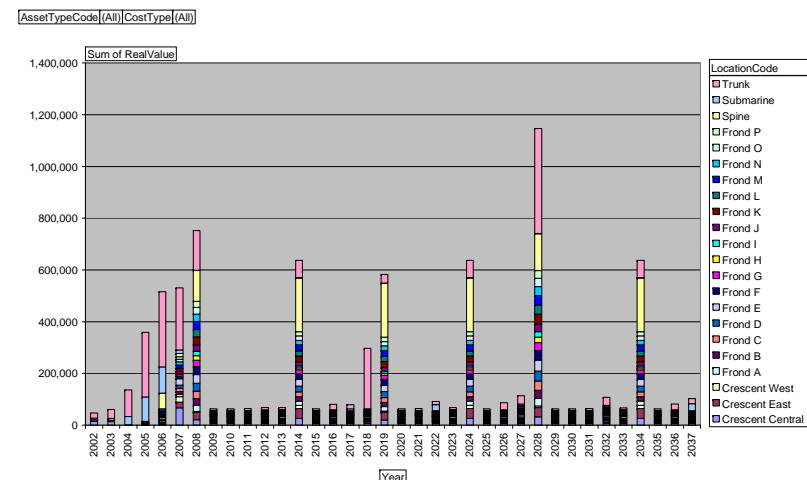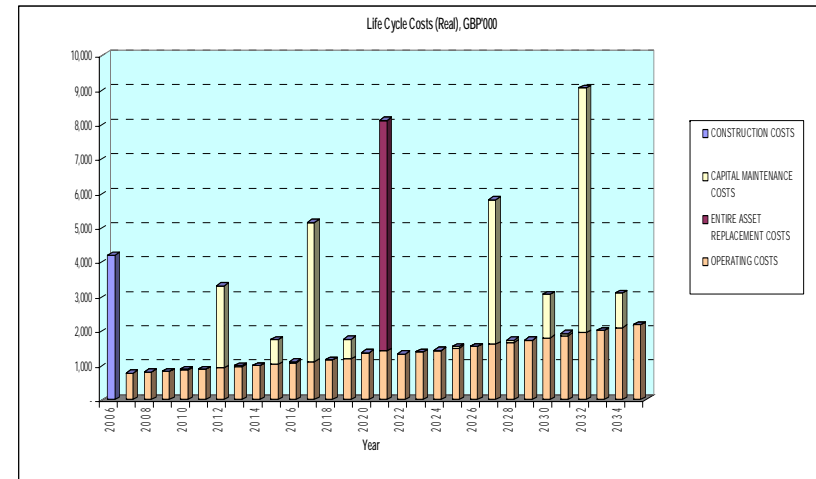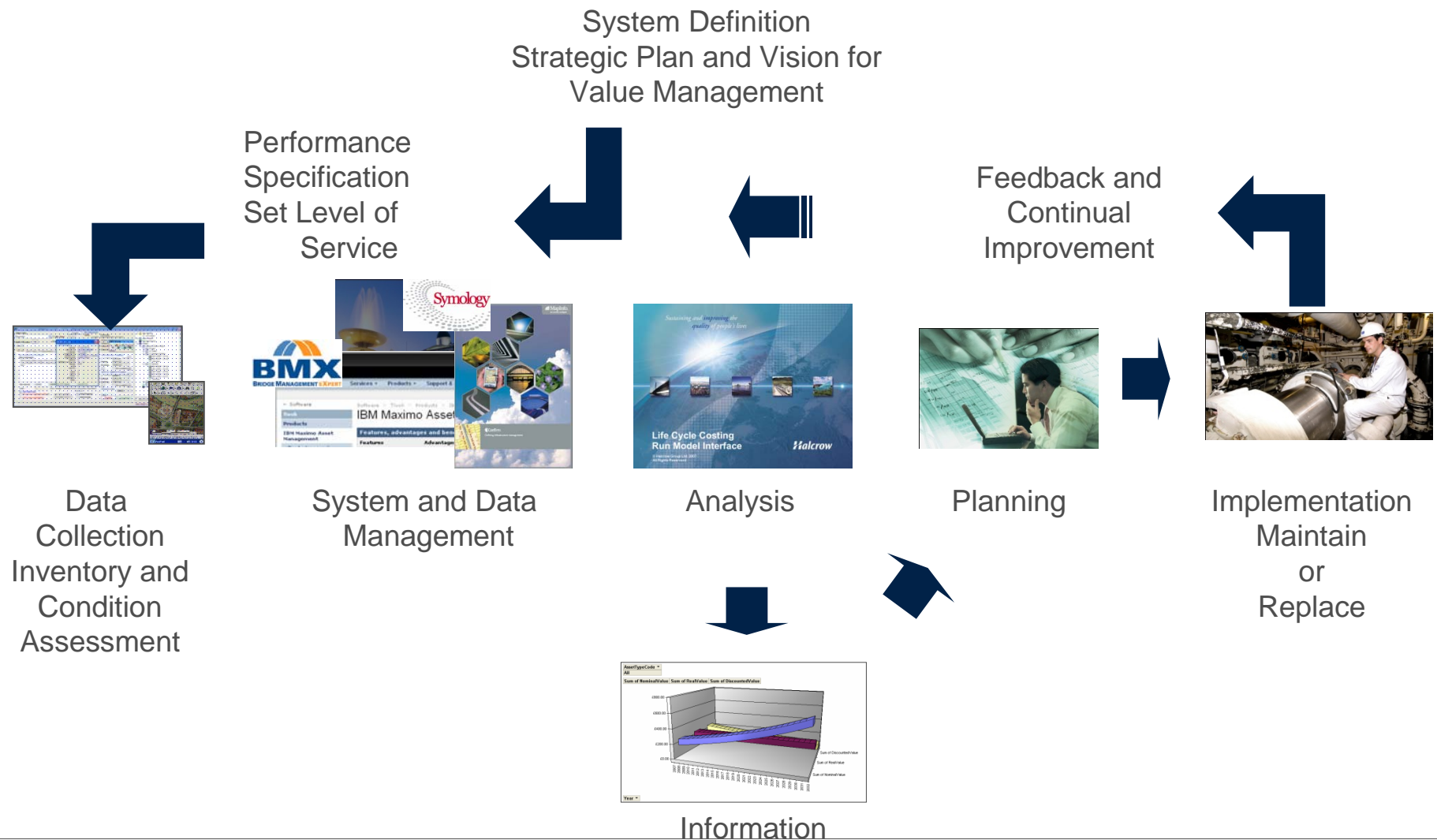
Best Practices and Lessons Learned

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- The Right Tool for the job
- Organizational support
- Clearly defined organizational goals
  - Port strategy should be driver for decision-making
- Clearly defined levels of service
  - What is acceptable? What is the goal?
  - Serves as benchmark for performance, thus funding
- Clearly defined criticality
  - Factor in prioritization
  - Not an issue with unlimited funding…
  - Resources are finite- where are they deployed most effectively?
- Goal is continuous improvement
  - Inspection and Evaluation is Key to Refinement
  - Demand what you need from Inspection Program

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- Automating judgment may not be worthwhile
- Materials technology is key
    - Understanding hidden deterioration
    - Modeling of deterioration, applying calculated timescales and applying a valuation
- Flexibility
    - Guaranteed evolution in IT industry
    - Important not to lock owners into highly customized, proprietary software
- Scalability
    - Systems should be interoperable with existing systems and capable of supporting other infrastructure types

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Case Study

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Case Study – US Navy

- Follows system overview approach
- 1,400 + Facilities
- Development of comprehensive asset inventory tool
  - ASTM Uniformat II Coding
- Paperless process
- Inspection data warehousing
- Open standards
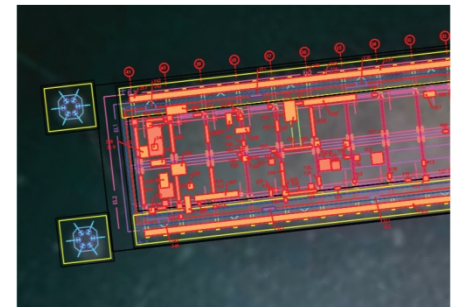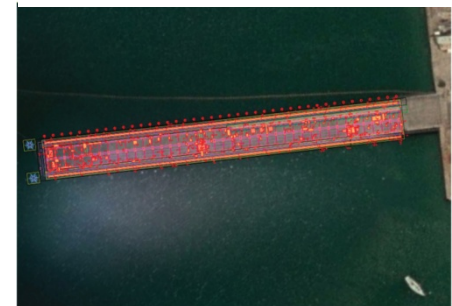
Thank you!

Kirk Riden, Halcrow

Michael Russalesi, Synergy Software Design