Freedom from Endless Spreadsheets
Application Portfolio Management Made Easy

Tim Hahn
IBM

9 August 2011
Session 9775
Abstract

Any mature organization has more than a handful of applications to maintain, enhance, or even create. And every organization struggles to identify, prioritize, and align their application development projects with the needs of the business. In this session we'll provide an easy to follow process for managing your portfolio of applications, prioritize which applications need the most attention, identify the appropriate projects to undertake, and set up for repeated review and analysis of your application portfolio based on your business requirements. Both the process and tools to support the process will be discussed.
Agenda

• Application Modernization – what is it?
• Manage Applications as a Business
• Define Modernization Roadmap
• Technical Planning
• Application Renovation
• Summary
Agenda

- Application Modernization – what is it?
- Manage Applications as a Business
- Define Modernization Roadmap
- Technical Planning
- Application Renovation
- Summary
Application Modernization

- Application Portfolio Management (APM)
  - Manage Applications as a Business
    - Understand your inventory (assets and liabilities)
      - *Software applications*
      - *Systems where that software runs*
      - *Dependencies between applications*
    - Relationship of software to your business
  - Define Modernization Roadmap
    - Determine which applications are most important to your business goals
    - Determine what direction to take for your applications
    - Estimate the costs of taking those directions
- Perform Modernization Projects
  - Technical Planning
    - Understand existing applications in deep detail
    - Locate relationships between source code and data
    - Identify specific tasks for teams to accomplish
  - Application renovation
    - Update, enhance, replace, retire, and so on
A process with information feeds
Effectively translate business needs to executable roadmaps

Sample feeds

Application Portfolio Management
Gather info, analyze, make decisions

Enabled through maturing analytics:
Qualitative ➔ Quantitative ➔ Predictive
Agenda

• Application Modernization – what is it?
• Manage Applications as a Business
• Define Modernization Roadmap
• Technical Planning
• Application Renovation
• Summary
Manage Applications as a Business

- An Enterprise is built over time
  - Projects build upon one another
  - De-centralized teams and a plethora of technology options created many solutions
  - Subtle dependencies may exist between subsystems
  - Different initiatives result in different architectures existing across the IT environment
- Goals
  - Align application investments with current and future business goals
  - Don't over-invest in non-essential applications
  - Invest in important applications
- Tasks
  - Identify your business goals
  - Understand the inventory of applications in use
  - Understand the systems these applications depend upon
  - Understand the dependencies between applications
  - Evaluate the impact of these applications to your business goals
  - Determine which applications are of highest priority to act on (modernize, change investment level, retire, etc.)
## APM Dashboard – Application Performance

<table>
<thead>
<tr>
<th>Name</th>
<th>Portfolio</th>
<th>Star Rating</th>
<th>Projected Annual Cost</th>
<th>Cost Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Risk Manager</td>
<td>Sales portfolio</td>
<td>4 stars</td>
<td>10,600</td>
<td></td>
</tr>
<tr>
<td>AutoFit</td>
<td>Enterprise Application Portfolio</td>
<td>2 stars</td>
<td>86,700</td>
<td></td>
</tr>
<tr>
<td>Billing</td>
<td>Finance Portfolio</td>
<td>1 star</td>
<td>608,000</td>
<td></td>
</tr>
<tr>
<td>GOLedger</td>
<td>Finance Portfolio</td>
<td>4 stars</td>
<td>42,400</td>
<td></td>
</tr>
<tr>
<td>Ledger</td>
<td>Finance Portfolio</td>
<td>5 stars</td>
<td>616,900</td>
<td></td>
</tr>
</tbody>
</table>

- Lists all the applications in the organization's portfolio
- Rates the applications from one to five stars
  - five star application represents a high performer
  - one star application represents a poor performer
- Ratings are calculated from a number of analytics including financial performance, technical information, organization, etc.
Applying Analytics to Determine Funding Levels

Propose investment levels based on alignment with strategic initiatives

Result:
• Increased transparency
• Objective decision making
• Scalable solution

Ability to contribute to growth (percentile)

Business efficiency (percentile)

Score card
Portfolio Management
Example: Ledger Application

• Favorable business assessment
• Trend: Financials, operations headcount and development headcount have decreased.
Portfolio Management
Example: Billing Application

- Declining rating, low usage, poor business and IT alignment.
- Trend: Maintenance and SW licensing cost trending upwards.

Business Assessment

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Alignment</td>
<td>2 - Low</td>
</tr>
<tr>
<td>Business Criticality</td>
<td>4 - High</td>
</tr>
<tr>
<td>User Base</td>
<td>1: &lt;10</td>
</tr>
<tr>
<td>Availability</td>
<td>3 - 12x5</td>
</tr>
<tr>
<td>Impact on Outage</td>
<td>1 - Low</td>
</tr>
<tr>
<td>Revenue Generation</td>
<td>4 - High</td>
</tr>
<tr>
<td>Revenue Growth Potential</td>
<td>2 - Low</td>
</tr>
<tr>
<td>Customer Facing</td>
<td>1 - No</td>
</tr>
<tr>
<td>Flexibility Importance</td>
<td>3 - Important</td>
</tr>
<tr>
<td>Business Risk</td>
<td>3 - Medium</td>
</tr>
</tbody>
</table>

Technical Assessment

<table>
<thead>
<tr>
<th>Category</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Alignment</td>
<td>1 - Very Low</td>
</tr>
<tr>
<td>IT Risk</td>
<td>4 - High</td>
</tr>
</tbody>
</table>

Business Score

Financials

Technical Assessment
Determine Investment Levels and Need for Additional Analysis

- Fund additional enhancements to the ledger application.
- Flag the billing application for additional analysis.
- Understand business alignment scores and software costs for the billing application.
Manage Applications as a Business

• Outcomes
  • An accurate inventory of applications, infrastructure, and dependencies
  • An understanding of the business goals of the organization and how they relate to the application inventory
  • A prioritized list of applications to further investigate, with a candidate type of high-level action (modernize, change investment level, retire, etc.)

• Next steps
  • Do deep dive analysis of prioritized applications to determine path to follow
    • Estimated costs of each approach
    • Estimated benefits of each approach
    • Dependencies for each approach
    • Which modernization strategy to implement
Agenda

- Application Modernization – what is it?
- Manage Applications as a Business
- Define Modernization Roadmap
- Technical Planning
- Application Renovation
- Summary
Define Modernization Roadmap

Like any potential project, pros and cons must be considered

- Is it worth working on the application?
- What type of work should we do?
- Will the work I perform pay off? When?

Goals

- Identify the relative importance of applications to business goals
- Identify applications to renovate
- Identify the appropriate approach to renovation (retain, retire, replace)

Tasks

- Perform static analysis of the applications to understand
  - Size
  - Complexity
  - Maintainability
  - Relationships
- Outline modernization options with pros and cons
- Compare the costs and expected benefits of different renovation methods
- Determine the path to take for each renovation project
Retire, Retain, Replace – What Are the Options

There are a spectrum of strategies

The business drivers are one of several reasons for selecting which modernization strategy is the most appropriate

Remediation projects need to be assessed based on their contribution to business drivers vs. project cost and execution risk
Portfolio Management
Example: Billing Application

- Vendor increased SW licensing cost by 120% in the last two years.
- Labor cost increases due to skills exposure.
- Low code quality, brittle architecture.

<table>
<thead>
<tr>
<th>Technical Assessment</th>
<th>Rating History</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Alignment</td>
<td>Average Labor Cost</td>
</tr>
<tr>
<td>IT Risk</td>
<td>4 - High</td>
</tr>
<tr>
<td>Size</td>
<td>32,000</td>
</tr>
<tr>
<td>Defect Rate</td>
<td>188</td>
</tr>
<tr>
<td>Defect Density</td>
<td>5.875</td>
</tr>
<tr>
<td>Dependency Factor</td>
<td>2 - Low</td>
</tr>
<tr>
<td>Meet SLAs</td>
<td>1 - Yes</td>
</tr>
<tr>
<td>Skills Risk</td>
<td>5 - Very high</td>
</tr>
<tr>
<td>Code Complexity</td>
<td>1.9</td>
</tr>
<tr>
<td>Maintainability Score</td>
<td>1.8</td>
</tr>
<tr>
<td>Transferability Score</td>
<td>2.1</td>
</tr>
<tr>
<td>Changeability Score</td>
<td>2.4</td>
</tr>
<tr>
<td>Robustness Score</td>
<td>2.2</td>
</tr>
</tbody>
</table>

IT Score 18 (out of 100)
Determining the potential benefit of an approach

Applying analytics to understand benefits vs. cost and risk

Option analysis: Migrate from Natural / Adabas to EGL or replace with ERP?

- Model uncertainty (risk) of your benefit and cost stream
- Calculate Net Present Value (NPV) of doing a migration
- Assess which alternative provides the most favorable NPV

<table>
<thead>
<tr>
<th>Cost</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Migrate to EGL</td>
<td>$1.5 / loc</td>
</tr>
<tr>
<td></td>
<td>Inherited technical debt, less agile system</td>
</tr>
<tr>
<td>Replace with ERP module</td>
<td>$3 / loc</td>
</tr>
<tr>
<td></td>
<td>Package will require large amounts of customization</td>
</tr>
</tbody>
</table>
Establish Execution Roadmap

- Using the tools, investigate several options
- Assess the potential costs and skills requirements
- Select a migration approach which works best for the organization

Build rough schedules to assess do-ability
Define Modernization Roadmap

- Outcomes
  - An ordered list of application renovation projects – and approaches to take
  - Projects ordered by relevance and alignment to business goals
  - An estimate of the time, resources, and return on investment for each project
  - Define roadmap of which projects to do when, with consideration for resource supply constraints

- Next Steps
  - Allocate teams to work on the renovation projects
  - Perform more detailed application analysis during the renovation
  - Dispatch application renovation work projects

- And begin the Application Portfolio Management cycle again!
Agenda

- Application Modernization – what is it?
- Manage Applications as a Business
- Define Modernization Roadmap
- Technical Planning
- Application Renovation
- Summary
Technical Planning

• This is where deep technical work starts
  • Any application renovation project requires program understanding
  • What modules do we need to update?
  • Which databases are affected, and how?
  • What impact will that have on the existing application source code?

• Goals
  • Understand the application's components and how they depend upon one another
  • Establish a detailed understanding of the application source code
  • Identify the specific areas of code and data that require modification

• Tasks
  • Ensure that the application source code is under change management
  • Analyze the application source code, database tables, and build environment
  • Analyze program flow and component diagrams to understand code structure
  • Plan the renovation project work tasks based on analyzing impact of required changes

“Here be dragons.”

“The devil is in the details.”
## Application Analysis – high level view of source code base

### Explore MVS assets

<table>
<thead>
<tr>
<th>Run time</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batch job</td>
<td>57</td>
</tr>
<tr>
<td>CICS group</td>
<td>221</td>
</tr>
<tr>
<td>CICS online region</td>
<td>2</td>
</tr>
<tr>
<td>CICS transaction</td>
<td>938</td>
</tr>
<tr>
<td>DB2 system</td>
<td>5</td>
</tr>
<tr>
<td>IMS DBD</td>
<td>45</td>
</tr>
<tr>
<td>IMS subsystem</td>
<td>2</td>
</tr>
<tr>
<td>IMS transaction</td>
<td>50</td>
</tr>
<tr>
<td>Run unit</td>
<td>1317</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMS map definition</td>
<td>115</td>
</tr>
<tr>
<td>BMS map set definition</td>
<td>115</td>
</tr>
<tr>
<td>Concatenation set</td>
<td>16</td>
</tr>
<tr>
<td>DB2 stored procedure</td>
<td>215</td>
</tr>
<tr>
<td>Entry point</td>
<td>447</td>
</tr>
<tr>
<td>IMS PSB</td>
<td>104</td>
</tr>
<tr>
<td>Literal</td>
<td>19984</td>
</tr>
<tr>
<td>Program</td>
<td>456</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Data</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data element</td>
<td>158995</td>
</tr>
<tr>
<td>Data set</td>
<td>445</td>
</tr>
<tr>
<td>Data store</td>
<td>325</td>
</tr>
<tr>
<td>DB2 column</td>
<td>4889</td>
</tr>
<tr>
<td>DB2 table</td>
<td>541</td>
</tr>
<tr>
<td>DD name</td>
<td>1361</td>
</tr>
<tr>
<td>I/O record description</td>
<td>749</td>
</tr>
</tbody>
</table>
## Inventory - lists – search-able summary for each type

### Program summary

<table>
<thead>
<tr>
<th>Program</th>
<th>Language</th>
<th>Analysis status</th>
<th>Action</th>
<th>Number of lines in program</th>
<th>Source location</th>
</tr>
</thead>
<tbody>
<tr>
<td>QAD01</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>522</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD02</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>491</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD02A</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>498</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD03</td>
<td>PLI</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>741</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD04</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>482</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD05</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>609</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD06</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>164</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD07</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>337</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD08</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>179</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
<tr>
<td>QAD09</td>
<td>COB</td>
<td>Completed</td>
<td>delete, annotate</td>
<td>269</td>
<td>C:/Program Files/IBM/Rational Asset Analyzer/sample</td>
</tr>
</tbody>
</table>
Define work items and tasks

- Predefined, custom and personal queries
- Subscribe to work items you're interested in
- Integrated discussion threads
- Query results
- Undersands and persists work item's relationship to SCM and build artifacts
Plan work across team members

Understand how well you are progressing against your targets in real-time

Plan and execute iterations while managing team and individual load

 Drag-and-drop work items to change owners/create child parent relationships

<table>
<thead>
<tr>
<th>Team Area: UWS Temperature Conversion Team</th>
<th>Iteration: 1.0 M1 (12/1/07 - 6/20/08)</th>
<th>Closed</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>April Blues</td>
<td>Closed items: 1</td>
<td>Open items: 1</td>
<td>UWS Create the temperature conversion CLI package</td>
</tr>
<tr>
<td>Derek Holt</td>
<td>Closed items: 0</td>
<td>Open items: 2</td>
<td>UWS Define permissions</td>
</tr>
<tr>
<td>Jerry Jazz</td>
<td>Closed items: 1</td>
<td>Open items: 1</td>
<td>UWS Define team members</td>
</tr>
<tr>
<td>Zach Builder</td>
<td>Closed items: 2</td>
<td>Open items: 2</td>
<td>UWS Create the core temperature conversion package</td>
</tr>
<tr>
<td>Zara Intern</td>
<td>Closed items: 0</td>
<td>Open items: 2</td>
<td>UWS Define iterations/milestones</td>
</tr>
<tr>
<td></td>
<td>Closed items: 1</td>
<td>Open items: 1</td>
<td>UWS Add JavaDoc to core temperature conversion JUnit tests</td>
</tr>
<tr>
<td></td>
<td>Closed items: 1</td>
<td>Open items: 1</td>
<td>UWS Create the core temperature conversion package JUnit tests</td>
</tr>
</tbody>
</table>
Technical Planning

• Outcomes
  • A plan, including assigned work items, for the renovation work project
  • A detailed understanding of the affected pieces of the application
  • A referrable information resource to help application development teams
  • An automated, repeatable, build environment for building the application

• Next Steps
  • Begin making changes to the application according to the work items and plan
  • Unit, function, and system test the changes
  • Reflect application information back into the application portfolio management system
Agenda

- Application Modernization – what is it?
- Manage Applications as a Business
- Define Modernization Roadmap
- Technical Planning
- Application Renovation
- Summary
Application Renovation

• Each renovation project will take on different characteristics
  • Source code change
  • Database changes
  • Deployment platform and build modifications
  • Coordinated testing of the modified application
  • Staged deployment into production environments

• Goals
  • Successfully complete the required changes to the application
  • Ensure a smooth and efficient quality assurance phase
  • Deploy the renovated application into the production environment

• Tasks
  • Make changes to application source code and data designs
  • Test these changes in a local development environment
  • Collect changes made by multiple team members for consolidated build
  • Test and QA the combined set of changes
  • Plan and implement a staged deployment of the renovated application
Collaborative Lifecycle Management

*Deploy new, common team infrastructure to manage modernization projects*

Benefits

✔ Improved communication, higher quality, informed decision making, and more automated, transparent, and predictable software development
✔ Support for re-platforming, UI modernization, conversion, refactoring, and rewriting

Rational Team Concert
Rational Business Developer
Rational Developer for zEnterprise
Rational Developer for System z / UT
Rational Asset Analyzer
Application Renovation

- Outcomes
  - Successful changes made to applications
  - Deployed into production environments
  - With measurable improvements to the business

- Next Steps
  - Reflect information learned back into Application Portfolio Management tools
  - Measure savings and benefits of the application renovation project
  - Compare measurements to forecasts for use in determining future estimates
  - And start the next renovation project suggested by the Application Modernization Roadmap!
Agenda

- Application Modernization – what is it?
- Manage Applications as a Business
- Define Modernization Roadmap
- Technical Planning
- Application Renovation
- Summary
Adoption of APM: Industry Maturity

“Business leaders demand that IT leaders “do more with less” to free resources for innovation and growth. Applications professionals are turning to application portfolio management (APM) to meet those challenges”

- The Application Portfolio Management Landscape — Combine Process And Tools To Tame The Beast, Phil Murphy, Forrester Research, Inc. April 15, 2011

The market situation opens an opportunity for leaders to differentiate themselves from laggards
Summary

- Many companies spend more than 70% on keeping lights on, and that amount is increasing.
- IT organizations have problems modifying applications at speed of business.
- We provide a structured approach to incrementally modernize your portfolio based on business priorities.
- Change without a plan is chaos.
- A Plan without change is stagnation.
- Business goals change
  - applications need to change to address them.
- Continual renewal is required
  - tools help to guide, govern, drive, and accomplish this change.
Thank You

www.ibm.com/software/rational
Useful Links

- Rational System Architect
- Rational Focal Point
- Rational Insight
- Rational Team Concert Information:
- Rational Asset Analyzer Information
- Rational Developer for zEnterprise Information:
- Jazz Team Blog:
  - http://jazz.net/blog/
- My information
  - email: hahnt@us.ibm.com
  - Blog: