Mainframe Integration: Making the Right Connections

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- Director of Products and Services – blackboxIT, Inc
  - Background
    - Software / Systems Engineering
    - Project Management / Product Management
    - Mainframe Understanding Consulting
  - blackboxIT Product: evolveIT
    - Automated Analysis Tool
- Support of Fortune 500 Customers
  - Mainframe Analysis
  - Modernization
  - Integration
  - Business Rules
Topics

• Integration Survey of Customers

• Application architectures impact ability to integrate.

• Accurately identifying Integration points in your Mainframe?

• Integration as a first step to Modernization.
Experience with customers has taught us but…

Survey Data is a good confirmation!!!
Customers were asked 5 questions

- What is your primary role in your company?

- What kinds of Integration approaches has your company used to connect the Mainframe to Distributed/Web Applications?

- My experience shows that it is _________ to identify the Mainframe functions / Data that we want to integrate with Distributed / Web Systems.

- My company uses the following approaches to identify Mainframe functionality for integration.

- Has your company ever integrated a Mainframe Function/Service and later realized that the Function/Service being provided by the Mainframe was not the one desired?
Survey Says?

• Who Responded

What is your primary role in your company?

- VP / Director of IT
- Other IT Manager
- Manager of Distributed Application Development
- Manager of Mainframe Application Development
- Mainframe Developer / Analyst
- Distributed / Web Systems Developer / Analyst

- 34.8%
- 21.7%
- 21.7%
- 13.0%
- 8.7%
- 0.0%
Survey Says?

- What kinds of integration?

What kinds of Integration approaches has your company used to connect the Mainframe to Distributed/Web Applications?

- MQ Series / Message Broker
- CICS Transaction Gateway
- Web Service
- ODBC / JDBC or other Database only access
- Third party integration enabling tools
Survey Says?

- Difficulty to find Mainframe integration points?

My experience shows that it is ________ to identify the Mainframe functions / Data that we want to integrate with Distributed / Web Systems.

- Easy (Our SME’s know what to connect without analyzing Mainframe source code)
- Medium Difficulty (Our SME’s have a general idea but we have to analyze source code to make the right connections)
- Difficult - (We do extensive analysis to make sure we connect the right Mainframe functionality)
Survey Says?

• Approach to understanding Mainframe integration?

My company uses the following approaches to identify Mainframe functionality for integration.

- We identify Business Interfaces and then it is easy to make the connection. (11.8%)
- We identify Business Interfaces but we still need to find the specific point of connection through code analysis. (29.4%)
- We start with mainframe source code to find the transactions / data and key functions/services. It takes source code analysis to make the right connections. (58.8%)
Survey Says?

• Integrated the wrong process on Mainframe?

Has your company ever integrated a Mainframe Function/Service and later realized that the Function/Service being provided by the Mainframe was not the one desired?

- Yes: 62.5%
- No: 37.5%
Why Integrate Mainframe Applications?

- **Improved User Interface - Business Process focus**
  - Aggregate Data from mainframe screens into new Web UI

- **Lower Costs - Customer self service Portal**

- **Reduce errors due to manual processes**
  - Integration with outside applications
  - B2B integration
Why have >35% experienced incorrect Integration Results.

• Incomplete analysis - because it is hard to do the complete job without automated tools.
  • Many companies still use Text Scans and Code editors for Mainframe analysis

• Assumptions by Analyst that they know the application.

• It’s Difficult!
Architectures affect the analysts ability to accurately find Integration points

- Lots of “unique” architectures on the mainframe.
- Difficult to find functionality because of many years of change
Some “Uniqueness” That Make it difficult

- Dynamic functionality / Data Access
- Data accessed through custom I/O routines
- Database partially replaced (old and new database)
- Data Names reused but with different meaning
High Data Coupling

A system connectivity “Heat Map” can identify the degree of coupling of Application Data.

Areas of Higher density and connectivity indicate higher risk.
How to overcome the Architecture Challenges?
A Proposed Process to “Make the Right Connection”

- Determine the goal of Integration
- Focus on the Business Process
- Identify Output Data used by Business Process
- Trace Output Data using a Backward Slice
- Identify the “When” using “Logic (Decision) Flow”
- Validate! Validate! Validate!
Keep the Focus on the end user of the Integration

Not just data on screen??
Accurately identify Integration points in your Mainframe?

- Backward slice is your best approach to validating processing of integration points.
Business process provides meaning!!!
Business process provides meaning!!!

- Where do your users / systems connect?
Backward slice best approach to validating processing of Business Process output data.
What is a backward Slice?

- Start with the end point (Output Data)
- In the program that provides the output
- Find all direct contributing statements
- Identify data flowing through statements into output
- Continue data path analysis for contributing data
Accurately identify Integration points in your Mainframe?

- Trace the integration point to validate the processing / service being provided
Accurately identify Integration points in your Mainframe?

- Trace the integration point to validate the processing / service being provided

Understand how results are calculated

Understand Decision Logic to verify when the process runs

Direction of Data Flow

Backward Analysis Slice
Integration as a first step to Modernization
Integration as a first step to Modernization

- The integration provides an abstraction
- Opportunity to abstract data from application components
- Use data abstraction layer to move data or application functionality a piece at a time.
Application Modernization Approach

Database Abstraction

Current State

Mainframe Application

Abstraction Layer

Current Database

Integrating Database Abstraction and Application Modernization
Application Modernization Approach

1. Current State
   - Mainframe Application
   - Current Database

2. Database Abstraction
   - Mainframe Application
   - Abstraction Layer
   - Current Database

3. Application / Database Integration
   - Mainframe Application
   - Abstraction Layer
   - Current Database
   - Web Application

SOA - Database Access
Application Modernization Approach
Application Modernization Approach

1. Current State
   - Mainframe Application
   - Current Database

2. Database Abstraction
   - Mainframe Application
   - Abstraction Layer
   - Current Database

3. Application / Database Integration
   - Mainframe Application
   - Abstraction Layer
   - Current Database

4. Application Modernization
   - Mainframe Application
   - Abstraction Layer
   - Current Database
   - Web Application
   - Modernized Application

5. (Optional) Database Migration
   - Mainframe Application
   - Abstraction Layer
   - Current Database
   - Web Application
   - Modernized Application
   - Distributed System

Integration

Application Modernization
Application Modernization Approach

Every Step Enabled by Understanding Tools

1. Current State
2. Database Abstraction
3. Application / Database Integration
4. Application Modernization
5. (Optional) Database Migration

Mainframe Application
Mainframe Database
Mainframe Abstraction Layer
Current Database
Web Application
Modernized Application

Distributed System
Database Access

SOA

Database Abstraction
Application Modernization
Integration

(Optional) Database Migration
Application Modernization
Application / Database Integration
Database Abstraction
Current State

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So What???

- Integration can make a BIG difference in Customer Experience
- Integration can == BIG cost savings
- Integration can make IT more Agile

Mainframe Integration – Make the “Right” Connections!!!
Thank You

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