



## Legacy Systems Re-engineering: *Leveraging Your Existing Assets*

Presented by:

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Revenue Solutions, Inc.

FTA Technology Conference – Boise ID, 2009

## Introduction



### Danny Reeves

- 17 Years of Integrated Tax Implementation Experience
- Senior Manager – RSI's Legacy Systems Modernization Practice Line Lead and Project Manager for Maine Revenue Services MERITS Project



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# Revenue Solutions, Inc.



## Mission Statement

"Assist revenue agencies to maximize collections, increase compliance, improve customer service and streamline operations through the use of enabling technologies, in particular, integrated tax and tax data warehouse solutions"



www.RevenueSolutionsInc.com

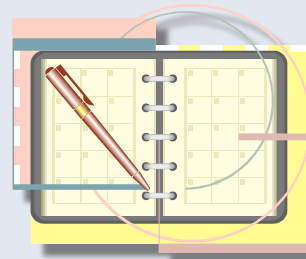
- Incorporated in May 1996
- Headquartered in Pembroke, MA with Solution Centers in Roseville, CA and Charlotte, NC
- Dedicated exclusively to providing products & services to tax agencies
- Over 200 tax professionals with 1000 combined years of revenue systems consulting
- Deep tax administration domain expertise
- Software Solutions for Integrated Tax and Integrated Compliance Management (Data Warehousing, Audit, Collections, Fraud...)
- Committed to client partnerships in delivery of projects



# Agenda



- Legacy Reengineering
  - Definition
  - Benefits
- MERITS Project Overview
  - Determining a Modernization Approach
  - Migration Strategy



## Legacy Systems Re-engineering

### Definition



*“Re-engineering is concerned with the safe, risk-free, and, above all, rapid transition of a legacy system to an open platform, the preservation of the organization’s assets wherever possible, and the elimination of technical risk to the organization by eliminating its dependence on proprietary or obsolete technologies.”*

*Re-engineering efforts are rapid due to their reliance on tools to automate the process and to ensure the consistency of the resulting code.”*

*Researchers from the University of Edinburgh and Carnegie Mellon University*

## Legacy Systems Re-engineering

### Benefits of Re-engineering



The benefits of the legacy re-engineering approach are:

- Cost-effective, low risk modernization option
  - 1/3 to 1/2 the cost of traditional wholesale replacement options such as COTS, transfer or custom
- Automatically preserves all current business functionality
- Enables targeted enhancements to the core solution that addresses particular business needs
- Provides a modern technical architecture with the flexibility to adapt to future changes in technology

## Legacy Systems Re-engineering

### *Benefits of Re-engineering cont'd*



The benefits of the legacy re-engineering approach are:

- Transforms user interface to a modern, browser based GUI
- No Data Conversion
- Minimizes organizational disruption
- Empowers developers with modern development tools

## Legacy Systems Re-engineering

### *Fundamental Premise*



- The fundamental premise underpinning the viability of re-engineering a legacy system that has to be assessed is:

*Does your legacy system currently meet the majority of your business needs?*



## Legacy Systems Re-engineering

### *MERITS Project Goals*



Maine Revenue Services (MRS) established the following modernization goals for the MERITS project:

- Provide an integrated tax administration system and *technology* that remains current and reliable well into the next decade;
- Migrate off of the mainframe;
- Provide additional or enhanced functionality which will improve productivity; and,
- Ensure that MERITS supports quick response to changing tax laws and state initiatives.



## Legacy Systems Re-engineering

### *Factors that Influenced Re-engineering Decision*

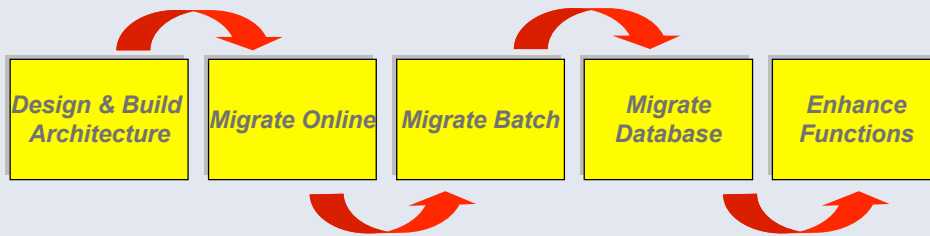


Maine Revenue Services determined that re-engineering their legacy Integrated Tax System (ITS) is the best method for achieving their modernization goals based on the following factors:

- Current ITS meets the vast majority of the business requirements
- Other options (e.g. COTS) do not offer major advances in “Functional/Business” capability, regardless of price
- Customizations built into legacy system to meet business needs were not present in other options
- Modernization goals can be achieved without “starting over” or “stepping backwards”

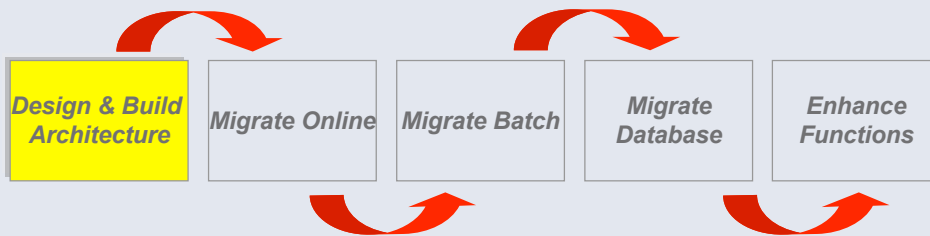
# Legacy Systems Re-engineering

*MERITS Migration Strategy*



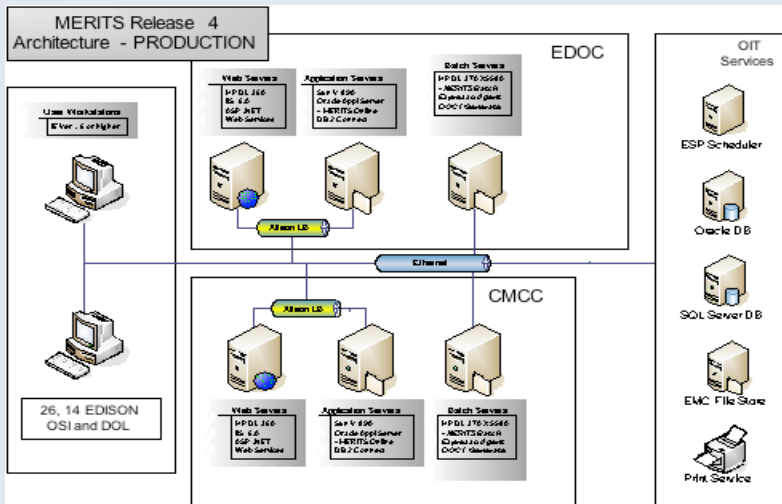
# Legacy Systems Re-engineering

*MERITS Migration Strategy*



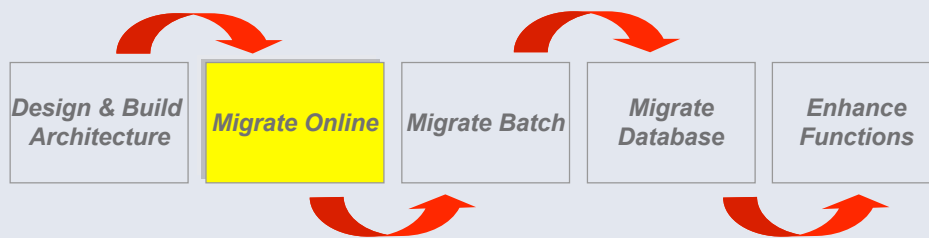
# Legacy Systems Re-engineering

## Migrating to an N-Tier Architecture



# Legacy Systems Re-engineering

## MERITS Migration Strategy



# Legacy Systems Re-engineering

## Migrate On-line



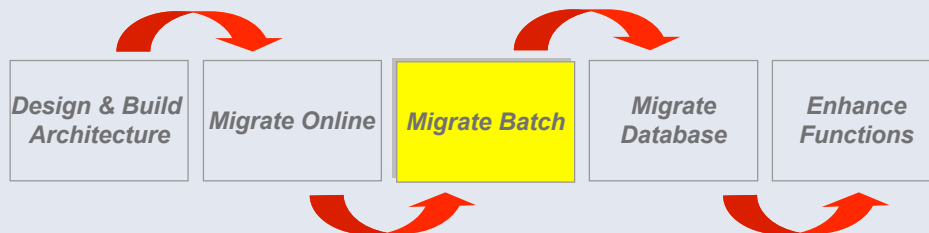
- Combined Prompt, List and Detail

The screenshot shows a web application interface for 'MERITS - Maintain Account'. It is divided into three main sections:

- Prompt:** 'ACCOUNT REQUEST' section with input fields for ENTITY ID (1), ACCOUNT TYPE (10 SALE), and ACCOUNT ID. It includes buttons for '11-ADD', '15-LOOKUP', '21-NEW/ENT', and '23-NEW/ENTF'.
- List:** 'ACCOUNT LIST' section showing a table of account records for 'ACME PLUMBING'. The table has columns for ACCOUNT TYPE, ACCOUNT ID, EFF DATE, END DATE, BUSINESS END DATE, and REL TYPE. Two rows of SALES TAX records are visible.
- Detail:** 'ACCOUNT DETAIL' section showing detailed information for the selected account, including EIN (45-8330000/0), ACCOUNT TYPE (SALE), ACCOUNT ID (0002322), STATUS (ACTIVE), GEO CODE (1010), AUBU TOWN CODE (11547), ELIO, EFFECTIVE DT (01/01/2007), SIC CODE, FED FBA, END DATE, FISC MM/DD (12/31), BESSS CODE (1), LUMBER, FILING FREQ (1), MV, and COUPON BK (1) NONE.

# Legacy Systems Re-engineering

## MERITS Migration Strategy



# Legacy Systems Re-engineering

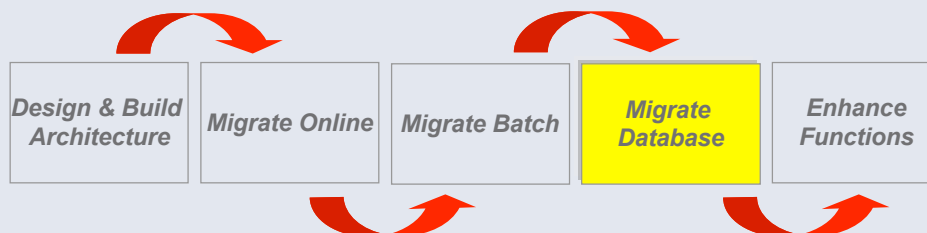
## Translating COBOL to Java or C#



- Translation Methodology
  - Utilizes a factory approach
  - Leverages automated tools and techniques
- Output
  - Produces a high fidelity translation
  - Applications are translated to classes
  - Paragraphs are changed to methods
  - MetaCOBOL replaced by Java methods
  - SQL replaced by function call in data access layer
  - Comments preserved

# Legacy Systems Re-engineering

## MERITS Migration Strategy



# Legacy Systems Re-engineering

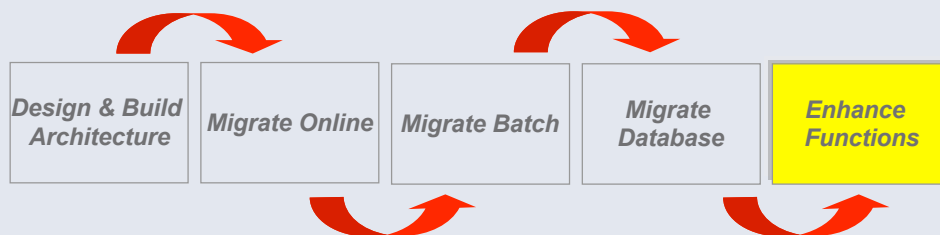
## Database Strategy



- Database remains on the mainframe until batch applications are translated
  
- Migrating from DB2 to Oracle
  - Maintains current data model
    - Except forms data, which is translated to XML
  - Migrates all current data to new platform
    - No data conversion process, routines, etc.
  - Use of IBM or Oracle Migration tools
    - Oracle Migration Workbench
      - Data migration using tools
      - Schema migration using manual conversion
    - DB2 Move utilities – automatic migration

# Legacy Systems Re-engineering

## MERITS Migration Strategy



# Legacy Systems Re-engineering

## Enhance Functions



- **Forms Development Workbench –**
  - Provides a modern web-based GUI to define tax forms
  - Stores form definitions in DB2 database
  - Option to migrate forms data to XML enables improved reporting
  
- **Enhanced Front End (Dynamic Posting)**
  - Batch Posting Pipeline
  - Migrate to real-time, work queue based engine
  - Addresses nightly batch performance concerns



# Legacy Systems Re-engineering

## Forms Definition Workbench



Define Filing Period    Define Tax Form    Association

**Selected Filing Def: FS100801**

FILED	BEGIN	DUE1	DUE2	DUE3	DUE4	DUE EXT1
1	2008-01-01	2008-01-31	2008-01-31	2008-01-31	2008-01-31	2008-01-31
2	2008-02-01	2008-02-29	2008-02-29	2008-02-29	2008-02-29	2008-02-29
3	2008-03-01	2008-03-31	2008-03-31	2008-03-31	2008-03-31	2008-03-31
4	2008-04-01	2008-04-30	2008-04-30	2008-04-30	2008-04-30	2008-04-30
5	2008-05-01	2008-06-02	2008-06-02	2008-06-02	2008-06-02	2008-06-02
6	2008-06-01	2008-06-30	2008-06-30	2008-06-30	2008-06-30	2008-06-30

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**Update Filing Period**

Filing Period: 3    Begin: 2008-03-01    End: 2008-03-31

Due 1: 2008-03-31    Due 2: 2008-03-31    Due 3: 2008-03-31    Due 4: 2008-03-31

Due Ext 1: 2008-03-31    Due Ext 2: 2008-03-31    Due Ext 3: 2008-03-31    Due Final: 2008-03-31

Grace 1: 5    2008-04-07    Grace 2: 5    2008-04-07    Grace 3: 5    2008-04-07    Grace 4: 5    2008-04-07

Grace Ext 1: 5    2008-04-07    Grace Ext 2: 5    2008-04-07    Grace Ext 3: 5    2008-04-07    Grace Final: 5    2008-04-07

Install 1: 100    Install 2: 100    Install 3: 100    Install 4: 100

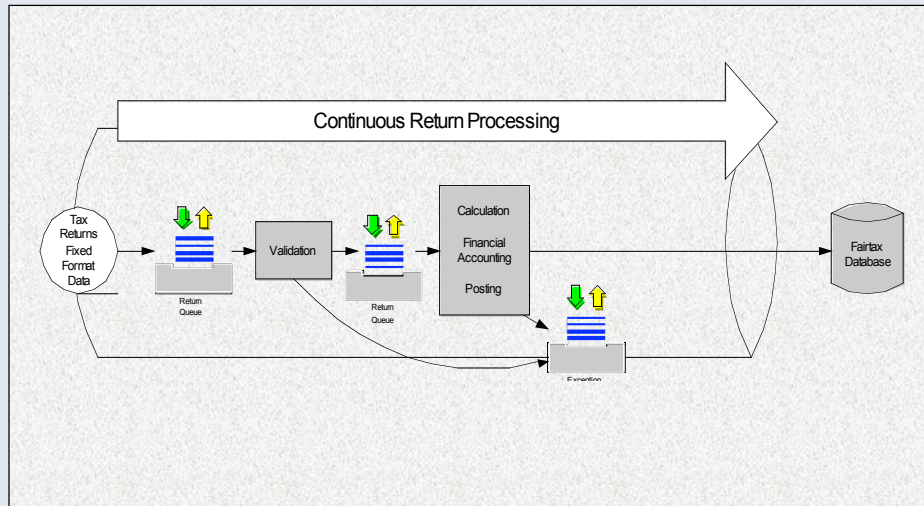
Install Ext 1: 100    Install Ext 2: 100    Install Ext 3: 100    Install Final: 100

March 2008

Sa	Mo	Tu	We	Th	Fr	Sa
24	25	26	27	28	29	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

# Legacy Systems Re-engineering

## On-Line Posting



# Legacy Systems Re-engineering

## Summary – Technical Architecture



	Legacy	MERITS
<b>Platform</b>	Mainframe	N-tier: Unix, Windows
<b>Language</b>	COBOL	Java
<b>GUI</b>	CICS	.NET
<b>Database</b>	DB2	Oracle
<b>Architecture</b>	Proprietary INSTALL/1	Open Standards

# Legacy Systems Re-engineering

## Assessing Re-engineering for your Department



Existing System Generally Supports the Department's Business Functions (i.e., Small % of "Future State" Requirements are Not Met by Current System)	
System Replacement is Primarily Driven by Technology Issues – 1) the need to standardize on state standards and 2) reduce cost and long-term maintenance issues	
Looking to Reduce Implementation Costs, Minimize Risk and Organizational Impact of the Modernization Effort	
Ownership of application code is a priority	

# Questions and Discussion

