Migrating Structured Data into an ECM/ERM Repository – Lessons Learned

“...safeguarding accessibility, availability, and retention of records when upgrading, replacing, decommissioning information systems.”
Outline

1. **Background & Context**
   - NSSC: Who we are & what we do
   - The System being decommissioned
   - The data/records being migrated
   - The receiving repository (TechDoc ECM/ERM System)

2. **Purpose/Goals of the Project**
   - Customers’ on-going Information Access Needs
   - Meeting Regulatory and Policy Requirements

3. **The Approach**
   - Project Management approach
   - Technical Concept/approach

4. **The Results: Successes – Future Benefits (“Lagniappes”)**

5. **Biggest Challenges**

6. **Summary of Lessons Learned & Takeaways**
Background: Who we Are & What we Do

The NASA Shared Services Center (NSSC)

- Opened for business March 1, 2006
- Result of an OMB A-76 competition to consolidate and perform selected business activities for all NASA Centers:
  - financial management
  - human resources
  - procurement
  - information technology
  - enterprise & business support services

- Consolidating of transactional and administrative activities –
  - allows NASA to increase operational efficiency
  - improve overall customer service

NSSC Records & Information Management (RIM) Program

- Our primary (internal) customers:
  - Enterprise Service Center (ESC --IT Help Desk/Contact Center)
  - Service Delivery functions at NSSC

- Our customers’ customers: NASA employees and contractors at all NASA Centers and HQ; including:
  - Managers, scientists, support personnel
  - Yes, even astronauts (on TDY)
One of our VIP Customers

SCOTT J. KELLY (CAPTAIN, USN, RET.)
NASA ASTRONAUT

Aboard International Space Station
March 2015 – March 2016

(Maybe wondering if the NSSC has processed his next ETDY per diem check?)
The Project: **Legacy System Decommissioning**

**Legacy System (BMC Remedy) Decommissioned**

- NSSC’s central work management & IT Service Management (ITSM) environment
- Used extensively by all NSSC functions/offices since 2006 inception;
- Extended/upgraded in 2010 to accommodate ESC and Enterprise IT Services orders placed with NASA contractors
- Approved for decommissioning in Dec. 2015 (part of NASA/NSSC modernization/cloud initiative)

**Replacement: Service Management/ITSM Cloud Platform (ServiceNow)**

- All previous Remedy applications/services transitioned to ServiceNow cloud-based platform June – Oct., 2015
- NSSC IT Strategic Management Board decided not to port Remedy closed/inactive content to ServiceNow*
The Project: *Legacy System Decommissioning & Content Migration*

NSSC Electronic Library & Transactional Document/Content Repository (TechDoc)

- NSSC’s central Enterprise Document/Content & Records Management System (EDRMS) since 2006 NSSC inception
- Also provides “image-enabled workflow” for distribution of all incoming transactional documents
- Decision made to migrate all Remedy legacy content to TechDoc at time of Remedy decommissioning (after consideration of multiple options)
Purpose and Goals: *Meeting Customer Needs*

1. Continued Accessibility, Availability, and Control of Data (Record and Non-record)

2. Ensure that Records in Legacy Systems are Preserved and Have Lifecycle Management Controls Until Disposition with Proper Authority

3. Minimize the Cost of Migration/Implementation

4. Identify/Clarify Recordkeeping Shortcomings in Legacy System (so they can be addressed early in Replacement System Development)
Legacy Data/Records to be Migrated

1. “Official Records” as Identified on Departments’ Master Records Indexes (MRIs)

   - **Human Resources (HR):** “Associated Work activity” for all HR Service Delivery activities
   - **Procurement:** “Associated Work Activity” for Grants, SBIR/STTR, Contracts and Training Purchases
   - **Financial Management (FM):** No Remedy data declared as “Records” on MRI, but all CRs/NSRs were included as “Associated Work activity”
   - **Information Technology (IT):** IT Service Requests & Change Requests (includes ESRS orders), SDR/Catalog Submissions, and System Notifications
   - **Business Office:** Inter-agency Purchase Agreements, Invoice Reconciliation, Liquidation & Costing, Performance & Utilization records
   - **Enterprise Service Center:** ESD & CCC Incidents and Knowledge Articles
Legacy Data/Records to be Migrated (cont.)

2. All Data Contained in Various Remedy Items/Forms/Tables

- Change Requests (CRs in Remedy AR 6.3) and Service Requests (NSRs in Remedy ITSM 7.5)*
- Enterprise IT vendor (ESRS) Orders*
- Help Desk Incident tickets*
- Knowledge Articles (exported but not migrated to ECM/ERM system)
- Broadcasts/notifications

* includes attachments, associations, dependencies, links, and audit logs as part of the record (i.e. “Parent” and “Child” data sets)

3. Other “Non-record” Exported Data was TBD
Project Management Plan/Approach
(Adjusted for Agile Scrum Methodology as needed /on the fly)

1. Develop Data Conversion Proof of Concept with Target System Vendor
   • Used one legacy data category (Broadcasts)
   • Included resolution of parent/child document and attachments approach
   • Measure end to end process step throughput rates (to estimate resource needs & total time required for project)

2. Demo Technical/Conversion Approach
   • What is to be exported from Remedy
   • What imported data/documents will look like and how they will behave in ECM/ERM

3. Determine Phasing/”Sprints” and Develop Schedule for Completion of All Data Migration

4. Obtain “Product Owner” Decision to Proceed with Development, Testing and Implementation
5. **Refine RIM and Functional User Requirements for Structure/Taxonomy and Access**
   - Iterative during multiple Sprints

6. **Develop Test/QA Plan for RM/Functional User Validation**
   - To ensure all exported data exported is accurately converted and correctly populated in ECM/ERM
   - To ensure RIM and Customer Users’ functionality requirements are met

7. **Complete Migration Soon After ServiceNow Go-Live and Before Decommissioning of Remedy**
Resolving Project Mgt. & Conceptual Design Issues

1. Determining Definitive Date Planned for Remedy Decommissioning
   - Impacts of new security requirements and server/infrastructure upgrades needed
   - Plans/prospects for Remedy software license renewal beyond Dec. 2015

2. Lack of Detailed Customer Functional Requirements for Continued Access & Use of Data Once Migrated
   - Cabinet/folder structure?
   - Access (local read for NSSC users and web-search for outside users)?
   - Access restrictions (by group and/or individual user)?
   - Document number/naming conventions and required metadata?
   - Specific TechDoc search, presentation format and functionality needed to meet all operational requirements (as well as RIM requirements)?
3. **Determining Time and Resources Needed**
   - to Develop TechDoc Structure and Metadata Taxonomy
   - to Implement for All Categories of Data to be Migrated

4. **Reengagement of Conversion Script/Utility Developer**
   - Had been diverted to TechDoc upgrade implementations
   - Had other customer migration project priorities

5. **Confirming Decisions on Pre-migration Data Cleanup**
   - No Purge of Redundant/Unneeded (ROT) Data
   - No Disposition of Records with Expired Retention Requirements
Migration Project Technical Approach *(Overview)*

1. **Export All: “Official NSSC Records” & Other Data**

2. **Exported XML Data Converted to HTML Document Format**
   - for Import into ECM/ERM System (TechDoc)
   - Conversion Utility Developed by EDRMS Developer/Vendor (Prevo Technologies)

3. **TechDoc to Ingest each Primary Remedy Item (Service Request, Incident ticket, etc.)**
   - Each Item as “Parent” Document
   - “Child” Information Either Embedded or Attached
   - Automated Import Scripts Created Sub-folder structure & Associated Metadata
4. **Other Non-record Data Migrated and Handled as Misc. (Uncategorized) Content**
   - To be held in TechDoc temporarily for contingency needs (time period TBD)
   - Search capability limited due to lack of organizational/identifying metadata

5. **Once Converted and Loaded, Normal ECM/ERM Functionality Will be Available, Including:**
   - Search/retrieval by metadata attributes, full-text search, folder browsing;
   - View, download and print
   - Standard and ad-hoc reports
   - Application of Records Retention/Disposition rules/authorities
   - Other RM and ECM capabilities
The Records Migration Approach

Structured Data in Multiple Database Tables Exported:
- Change Requests and Service Requests including I3P ESRS orders*
- Incident tickets *
- Knowledge Articles
- Broadcasts/Notifications
- Potentially other non-record data (exact content unknown)

* Includes all attachments, associations, dependencies, links, and audit logs as part of the record

Conversion/Migration Utility & Scripting:
- Converts XML into HTML Text
- Maps related data/forms to respective Record Documents
- Associates “parent” records with their “child” records
- Builds Folder Structure
- Auto-loads converted files into TechDoc as e-documents

Semi-Structured Content in an EDRMS environment:
- Primary (parent) documents with—
  - Metadata
  - Associated (child) documents
- Functionality:
  - Search/Retrieval/View/Print
  - Access Control/Security
  - Reporting
  - Records Management

RELEASED - Printed documents may be obsolete; validate prior to use.
The Results: **ECM/ERM Repository Migrated Records Taxonomy**

### Top Level Structure

<table>
<thead>
<tr>
<th>Container Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>REMEDY LEGACY INFORMATION</td>
<td><em>Information migrated from Remedy system</em></td>
</tr>
<tr>
<td></td>
<td>- Broadcasts - Includes system status, news flashes, system issues, upgrades, outages and associated history</td>
</tr>
<tr>
<td>Broadcasts</td>
<td>ESRS Orders for all I3P vendor provided services, systems, and components</td>
</tr>
<tr>
<td></td>
<td>Incidents tickets for Enterprise Service Desk (ESD) and Customer Contact Center (CCC)</td>
</tr>
<tr>
<td>ESRS Orders</td>
<td>NSRs - CRs (24 sub-folders)</td>
</tr>
<tr>
<td>Incidents</td>
<td>Remedy Service Requests (7.5) and Change Requests (6.3)</td>
</tr>
<tr>
<td>NSRs - CRs</td>
<td>Submission of services to SDR - Published/Implemented and Unpublished/Not Implemented submissions</td>
</tr>
<tr>
<td>Submission of Services to SDR</td>
<td></td>
</tr>
<tr>
<td>Surveys - ESD and ESR</td>
<td>Completed surveys for ESD and ESRS - automatic survey sent to customer after NSR/Incident ticket is resolved; includes customer response</td>
</tr>
</tbody>
</table>

### Sub-Folder Structure (typical)

- **NSRs - CRs (24 sub-folders)**
  - HR Associated Work Activity Records
    - 2006
    - 2007
    - 2008
    - 2009
    - 2010
    - 2011
    - 2012
    - 2013
    - 2014
    - 2015
- **IT Service Requests**
  - 2006
  - 2007

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**RELEASED** - Printed documents may be obsolete; validate prior to use.
The Results: *Records/MetaData as viewed in ECM/ERM Repository*

### As HTML/Text Doc in TechDoc

**Help Desk Incident INC000001534146** (Parent Record)

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assign To Vendor</td>
<td>No</td>
</tr>
<tr>
<td>Assigned Group ID</td>
<td>SGP0000000000550</td>
</tr>
<tr>
<td>Assigned Group</td>
<td>NSSC CONTACT CENTER</td>
</tr>
<tr>
<td>Assigned Support Company</td>
<td>NASA</td>
</tr>
<tr>
<td>Assigned Support Organization</td>
<td>NSSC - CCC</td>
</tr>
<tr>
<td>Assignee Groups</td>
<td>1000000148;1000000149;534;</td>
</tr>
<tr>
<td>Assignee Login ID</td>
<td>(ID Redacted)</td>
</tr>
<tr>
<td>Assignee</td>
<td>(Name Redacted)</td>
</tr>
<tr>
<td>Check CI Related On Resolved</td>
<td>No</td>
</tr>
<tr>
<td>City</td>
<td>Stennis Space Center</td>
</tr>
<tr>
<td>Client Type</td>
<td>Contractor</td>
</tr>
<tr>
<td>Company</td>
<td>NASA</td>
</tr>
<tr>
<td>Contact OIG</td>
<td>No</td>
</tr>
<tr>
<td>Contact Sensitivity</td>
<td>Standard</td>
</tr>
<tr>
<td>Contact VIP</td>
<td>No</td>
</tr>
<tr>
<td>Corporate ID</td>
<td>(ID Redacted)</td>
</tr>
<tr>
<td>Country</td>
<td>United States</td>
</tr>
<tr>
<td>Create Request</td>
<td>No</td>
</tr>
</tbody>
</table>

### Doc Info (metadata) in TechDoc

**Document Info**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Folder</td>
<td>/-TESTING TDv8/RonLTestFolder</td>
</tr>
<tr>
<td>Number</td>
<td>INC001534146</td>
</tr>
<tr>
<td>Revision</td>
<td>1</td>
</tr>
<tr>
<td>Title</td>
<td>CCC Incident migrated from Remedy for TEST</td>
</tr>
<tr>
<td>Doc File Name</td>
<td>INC001534146.html</td>
</tr>
<tr>
<td>Doc Type</td>
<td>ACT - Action</td>
</tr>
<tr>
<td>Doc Category</td>
<td>SBU - Sensitive But Unclassified</td>
</tr>
<tr>
<td>In Review</td>
<td>No</td>
</tr>
<tr>
<td>Point of Contact</td>
<td>FM - Financial Management</td>
</tr>
<tr>
<td>Organization</td>
<td>Layel, Ronald D</td>
</tr>
<tr>
<td>Reserved By</td>
<td></td>
</tr>
<tr>
<td>Resident Document</td>
<td>Yes</td>
</tr>
<tr>
<td>Web Search</td>
<td>Campus</td>
</tr>
<tr>
<td>Created</td>
<td>06/08/2015 15:18:20</td>
</tr>
<tr>
<td>Modified</td>
<td>06/08/2015 15:31:38</td>
</tr>
<tr>
<td>Released</td>
<td>06/08/2015 15:31:38</td>
</tr>
<tr>
<td>RMA Record</td>
<td>No</td>
</tr>
</tbody>
</table>

**Keywords**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer_Name</td>
<td></td>
</tr>
<tr>
<td>Date_Received</td>
<td>10/03/2014</td>
</tr>
<tr>
<td>NASA_Center</td>
<td>SSC - Stennis Space Center</td>
</tr>
<tr>
<td>Official_Record</td>
<td>Yes</td>
</tr>
<tr>
<td>Vital_Record</td>
<td>No</td>
</tr>
</tbody>
</table>

**Attachments**

<table>
<thead>
<tr>
<th>Field</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>1079</td>
</tr>
<tr>
<td>File Name</td>
<td>Copy of Email attachment to INC ticket.msg</td>
</tr>
<tr>
<td>Size</td>
<td>43 KB</td>
</tr>
<tr>
<td>Description</td>
<td>incoming email attachment</td>
</tr>
</tbody>
</table>
Results: “The Numbers”

- **Total Records/Documents Converted & Migrated = 3,411,000**
  - Official Records = 3,390,000
  - Other (non-record) docs. = <20,000

- **Migration Project doubled total doc volume in EDM/ERM repository**
  - 52% of Total Docs. at project completion
  - Additional 94.4 GB storage used (estimated)
Biggest Challenges

1. Getting Management OK to Proceed

2. Timeline: Moving Target “Deadlines”
   - No time for detailed user input on requirements

3. Migration Project Oversight by Replacement System Project Team
   - Adjusting for Agile Scrum Methodology as Needed /on the Fly

4. Legacy System (Remedy) Data and Application Unknowns
   - Multiple Customizations of Remedy Out of Box Application
   - Data structure largely unknown (IT developer & dba staff turnover over 9+years)
5. **Technical Issues**
   - Forms centric, multiple tables to Doc. centric ECM/ERM System
   - Parent/child relationships and attachments (had to be found & consolidated during conversion)
   - Remedy exports not always XML conforming
   - Duplicate data/files

6. **IT Support Staff with “Limited” RIM Knowledge**
   - Dba/developer worked some on earlier version upgrade/archiving
   - Competed for developer time (single thread) with work on replacement system (SN)
   - A mixed blessing: provided learning opportunity for PM and developers of RIM module in replacement system (ServiceNow)
Lessons & Tips

1. Get the Right Team on Board and Engaged
   - Must have IT, RIM, Customer/LOB POCs, and Vendor/contractor (if applicable)
   - Must have someone who knows the legacy data (Remedy)
   - Must have someone who knows the target repository (TechDoc EDRMS)

2. Conduct Regular/Scheduled Project Team Stand-up Sessions (Scrums)
   - Quick status updates
   - Identify blockages & new issues
3. **Start Early**
   - Get Mgt. decision/approval well in advance of scheduled decommission date
   - Get customers/users involved ASAP in requirements and planning
   - The actual conversion/upload will take longer than most expect

4. **Expect the Unexpected**
   - Changing customer requirements/preferences
   - Upper management expectations & outside constraints (security, deadlines, vendor priorities, infrastructure demands, etc.)
Other Takeaways

1. Use this Opportunity to Clean House; <30% Likely Required to Keep *
   - Official records required by regulation to retain
   - Mission critical and having high potential future business value (e.g. Data Analytics, info marketed externally)

2. Structure is Important; Pay Attention to --
   - Taxonomy
   - Names
   - Descriptions
   - Metadata

Other Takeaways (cont.)

3. **The Legacy System Data Migration Can/Should Provide a Valuable Roadmap/Framework for Future Systems That Take its Place (and/or Vice Versa)**
   - Work on RM module in ServiceNow significantly informed taxonomy and metadata structure for the migrated data moved to TechDoc;
   - Work on RM module of TechDoc and its application to migrated Remedy data informed data structures and functionality needed in ServiceNow.
   - “Data Insight” gained to inform/improve Information Governance (“Quantified IG”)**

4. **Plan for Next Big Migration Project: Consider Using “Metadata Correction Agent” Software***
   - Sort ROT from valuable content
   - Align content types and metadata

**| IGI White Paper, “Why Your IT Team Needs a Data Inventory (The role of data insight in IG & how to achieve it)”

*** “Your 8 Point Content Analytics Action Plan” in AIIM Trendscape: Content Analytics by John Mancini; © AIIM 2016, www.aiim.org (File Facets is an example)
Questions??
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