Data Migration: Strategy and Case Study
- Kian Xie
Summary

- Definition
- Scope
- Business Reason
- Process
- Risk
- Validation
- Case Study
- Take away message
Definition

An one-time tool-supported process aiming to migrate formatted data from a source structure to a target data structure.
Scope

- **Static Data**
  - Analysis
  - Product Specification
  - Customer / Contact
  - Sampling Point
  - Instrument
  - Scientific definition etc.
Scope cont.

- **Dynamic Data**
  - Sample, Test, Result
  - Project
  - Lot
  - Stability Study
  - Storage Record
Business Reason

- **Project Requirement**
  - Leverage existing configuration / data

- **Regulatory Requirement**
  - Data retention and access

- **Operation Requirement**
  - Trending (e.g. Quality Control, Shelf-life calculation)
  - On-going Work (e.g. Bio-banking)
Option 1: Into LabWare Structure

- Data Mapping
- Data Integrity Consideration (e.g. Sample, Test, Result)
  - Analysis: generic analysis with all the possible legacy result under
  - Sample Login Template
  - Linked fields / list
Data Migration Technique

- SQL Insert
- Database Mapping Tool (M0181)
- File Import: Sample/Test/Result, Lot, Batch, Project, Stand & Reagent
- LIMS Basic:
  - Log Sample + Assign Test
  - DB Clone
- ELN Based Static Data (M0548)
- Extract / Transform / Load (M0479 + M0539)
Option 2: Stand alone Table

- Stand alone tables within LIMS Database
  - Keep existing data structure and relationship
  - Data Cleaning is still recommended
- Search Template
- Report
- Visual Workflow
Data Migration Risks

Business Perspective
- Profit
- Regulators
- Reputation

IT Management Risks
- Target Application Stability
- Delays
- Extended Downtime
- Data/Information Loss
- Migration Abort/Failure
- Project Budget Overruns

Data Migration Project Risks
- Subprogram Risks
  - Completeness Risk
  - Semantics Risk
  - Corruption Risk
  - Stability Risk
- Data Migration Program Risks
  - Execution Time Risk
  - Orchestration Risk
- Infrastructure Risks
  - Dimensioning Risk
  - Interference Risk
- New Business Application Risks
  - Parameterization Risk

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Quality Assurance in Migration Project

Testing Technique

- Data Validation
  - Completeness types
    - Appearance Test
  - Semantics
    - Processability Test
- Migration run test
  - Partial Migration run test
  - Full Migration Run Test

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Case Study Summary

- Case Study 1: leverage existing configuration
- Case Study 2: historical data retention
- Case Study 3: operational data
Case Study 1: Background

- **4 geographical sites**
  - ABI SQL * LIMS – highly customized
- **Includes Packaging, Raw material and Final material item codes**
  - 7500 packaging item codes
  - 3500 final product item codes
Case Study 1: Objects

- Majority of the migrated data - product specification
- Other migrated data
  - Sample plans
  - Units
  - Etc.
Case Study 1: Data Mapping

- **Data translation – conversion / mapping**
  - SQL LIMS Operations -> LabWare analyses
  - Generic analyses
  - Calculation in LabWare LIMS
  - Specification structure
  - Pharma Template parameters in specification
Case Study 1: Tools

- **LabWare Data mapping tool (DMT) M0181**
- **In-house tool for manual mapping**
  - Mapping monographs (SQL LIMS) to product specification (LabWare)
  - SQL LIMS operation to LabWare analysis
  - SQL LIMS result to LabWare result
- **In-house pre-processing tool for data conversion based on mapping**
Case Study 1: Validation

- **Multiple pilot runs for migration process**
  - End-to-end testing in validated environment on representative “samples”

- **Migration post processing**
  - Subroutines / SQL scripts written to verify integrity
  - Mandatory values; Boolean fields; data relation
Case Study 2: Background

- Mature and evolved Sample Manager system
- SAMPLE – TEST – RESULT based migration
  - Related Static Data
- 5 Year Sample/Test/Result migration
  - 140K Samples
  - 420K Tests
  - 1.5M Results per year
Case Study 2: Object & Tool

- **Static Data**
  - Access DB
  - Extract / Transform / Load strategy
    - Keep Keys/Links
    - Translation for Status, Boolean
    - Tweak Analysis Variations, Component types, Units
Case Study 2: Object & Tool Cont.

- **Sample/Test/Result Data**
  - Small subroutine with M0181
  - Legacy Table full csv export
  - LabWare LIMS target table single ‘DEFAULT’ record export
  - LabWare file Import feature
  - Multi-thread and run in background
Case Study 2: Validation – Trial run

- **Predictable Process Time**
  - SAMPLE: 0.8s/Record
  - TEST: 0.53s/Record
  - RESULT: 0.36s/Record

- **Output File DB Import**
  - 4min/100K Records File
Case Study 3: Background

- **Legacy System with Specimen Museum**
  - Customized LIMS
  - 39800 stored specimen
  - Structure / Semi-structure
Case Study 3: Objects

- Specimen will be migrated as sample
- Storage detail will be migrated to Storage Manager
- User Interface: Visual workflow + Search template
Case Study 3: Process

- SQL to convert all storage item into a single csv file
  - Data mapping
- Sample login via file importer functionality
  - Including storage detail
- Storage Location Creation via simple subroutine
- Update Storage table based on Sample table through SQL
Case Study 3: Validation

- Trial run with one storage unit to validate the data migration process
- Entry Count ensuring no data loss
- Appearance Testing
Lessons Learned

- Build the right Team
- Plan Data Migration from the beginning
- Reusable and configurable solutions
- Keep It Simple
THANKS FOR YOUR TIME

DO YOU HAVE ANY QUESTIONS?

OR ANY EXPERINCES TO SHARE?