SAP Data Migration Case Study

16th September 2010

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Monica Howat - SAP Data Migration Lead – Release 1
Agenda

- STW background
- SAP Programme Scope, Structure and Release Strategy
- Data Migration – How we did it & the Challenges
- Achievements & What worked well
- Post go-live view
- Lessons learned / What we'd do differently next time.
Severn Trent Water provide high quality water and sewerage services to over 3.7 million households and businesses in the Midlands and mid-Wales – our region stretches across the heart of the UK from the Bristol Channel to the Humber, and from mid-Wales to the East Midlands

- 46,000 km of Water Mains
- 134 Water Treatment Works
- 54,000 km of Sewers
- 1,021 Sewage Treatment Works
- 5,600 Employees

- 1.8bn litres of drinking water p/d
- 2.7bn litres of waste water p/d
SAP Will Improve The Way We Do Things

- A step change towards our goal of becoming the best Water and Waste Water Company in the UK
- Improve the quality of service we are able to give our customers
- Processes which are integrated across our business
- Best practice processes which are efficient
- Reduce the costs of our IT
- Newer technology and a better tool to make it easier to do your job
- Better quality data which you can trust
- Access to better quality information, which we can use to manage our business and our assets
SAP Solution Scope (plus Click scheduling)

Customer Relationship Management (SAP CRM)
Supplier Relationship Management (SAP SRM)
Resource & Portfolio Management (SAP RPM)

SAP NetWeaver
The Project was organised into two releases:

- **Release 1 – Back Office**
  - HR
  - Finance
  - Procurement
  - Project Systems Basics

- **Release 2 – Front Office**
  - Workforce Management
  - Project Systems Complete including RPM
  - Click Scheduling

- The programme used the standard ASAP methodology for implementation
STW High Level Business Processes

1. Business Planning
2. Customer Order to Delivery
3. Customer Delivery to Bill
4. Bill to Payment
5. Payment to Cash
6. Plan to Invest 5-25 yrs
7. Plan to Invest 0-5 yrs
8. Invest to Adopt
9. Asset Adoption to End of Life
10. Source to Property
    Property to Water Course
11. Governance
12. Inventory to Use
13. Procure to Pay
14. Manage Finance
15. Recruit to Leave
16. Information
SAP Programme Structure

Programme Management

Data Migration
Development - SAP/Legacy
Business Change Mgmt
Technical Infrastructure
Testing & Cutover
Reporting

Offshore Solution Build & Test

Integration Management
Data Migration In The SAP Programme

- Data Migration Team Structure
- Key Objectives
- Challenges
- Migration Principles
- Tools
- Methodology
Core Team made up of STW, IBM and WIPRO resources:

- **STW (12)** – main contact between programme workstream and data migration activities. Responsible for creating all mappings, quality improvements and extracts from legacy systems.
- **WIPRO (14)** – responsible for creating and execution of transformation programs. Resources based both on and off-shore.
- **IBM (12)** – responsible for creating and running all load programs. Resources based both on and off-shore.

- Wider team included Programme Data Owners, Business Data Owners, legacy application experts and data quality improvement staff.
- Supplemented by contract staff with particular skills where necessary.
Data Migration Objectives

- 100% (or agreed lesser proportion) of source data deemed essential is migrated without error to SAP
- The SAP processes can operate without error
- Specific reconciliation controls are satisfied
Migration Challenges

- Disparate Sources which needed to be brought into a common structure
- Poor data quality in some areas
- Lack of business ownership for data
- Tight plan with overlapping data migration cycles
- Changing requirements / late decisions
- Management of sensitive data when working with an on-shore/off-shore model
- Some areas were very complex, e.g. Asset Structure and Project Budgets
- Length of migration cycle
- Release 2 had to be loaded into the live environment delivered in release 1.
Data Migration Principles – Key Themes

• Adapt legacy data to SAP
• Security safeguards applied based on Classification of data, with overall alignment to IM Policies & Standards maintained throughout
• Data to be migrated through a Transformation engine where possible
• Audit Trails, Reconciliation and Controls will be used and Cut-over tolerances will be defined
• No data migration to SAP Business Intelligence
• A freeze is applied for changes to source systems during cut-over
• Data Owners are identified for all key data entities
• Quality Issues essential to make SAP work will be captured in a Data Improvement Register and managed
• A separate Data Governance Group will be established
• No historic data was migrated unless critical to the SAP processes.
Tools Used

A range of Tools was used to support data migration:

**Extract / Collect New**
- SQL
- Report
- Excel

**Transform**
- Informatica
- MS Access
- Excel

**Load**
- SAP Legacy System Migration workbench (LSMW)
- SAP Emigall (high volumes)
- Winshuttle (a godsend!)
- Custom ABAP programs

**Field & Value Mapping**
- Excel

**Data Quality**
- Trillium
- MS Access
- Excel

**Validation & Reconciliation**
- MS Access
- Excel

Data models, system catalogue & integration with process design - Casewise
## Project Phases and Timescales

<table>
<thead>
<tr>
<th>Phase</th>
<th>Release 1</th>
<th>Release 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Preparation</td>
<td>4 months May – Aug 2008</td>
<td>4 months May – Aug 2008</td>
</tr>
<tr>
<td>Business Blueprint</td>
<td>7 months Sept 08 – Mar 09</td>
<td>7 months Sept 08 – Mar 09</td>
</tr>
<tr>
<td>Realisation</td>
<td>5 months Apr – Aug 2009</td>
<td>9 months Apr – Dec 2009</td>
</tr>
<tr>
<td>Final Preparation</td>
<td>3 months Sept – Nov 2009</td>
<td>4 months Jan – Apr 2010</td>
</tr>
<tr>
<td>Go-Live \ Cutover</td>
<td>5 weeks Nov – Dec 2009</td>
<td>5 weeks May – Jun 2010</td>
</tr>
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</table>
Data Migration Activities by Project Phase
Project Preparation

- Collated data models of legacy systems
- Documented legacy systems where this did not exist
- Created high level data model of SAP entities
- Identified legacy systems that contained data required by SAP
- Basic quality assessment of legacy data

- All information held in Casewise the STW Enterprise Modeling tool
Data Migration Activities by Project Phase
Business Blueprint

- Mapped data requirements to processes being designed
- Put in place a program of data quality improvements
- Held Field & Value workshops for each object identified for migration and created mappings
- F+V activities identified gaps which had to be revisited
- Created specifications for extracting data from legacy systems
- Liaised with Archiving and Decommissioning workstream to identify legacy systems to retire
Data Migration Activities by Project Phase Realisation

- Creation of extract programs from legacy systems - STW
- Creation of transformation programs in Informatica - WIPRO
- Creation of load programs using LSMW, Emigall and custom build – IBM
- All based on the output of the Field & Value workshops
- Repeated test cycles starting with small amount of data, increasing to 30%, 60% & 100% of total required
- Load verified by programme data owners, errors in programs corrected and re-tested
- Developed processes to collect new data where required.
Data Migration Activities by Project Phase

Final Preparation

- Completed two dress rehearsal loads
- Full dress rehearsal using timescales, data volume and process that would be used for cutover
- Validation of loads by both programme and business data owners
- Collection of new data required by SAP is underway
Data freeze on legacy systems where possible, with implementation of interim business work-arounds

Final extract, transform and load cycle

Cutover sign-off process followed, involving programme and business data owners

Delta loads of additional data in final stage where systems could not be frozen

Post go-live additional data loads to support rollout of SAP across all workforce areas.
More Depth On

- Extract, Transform & Load Process
- Field and Value Mapping Process
- Cutover and Sign-off Process
Data Migration Overview - ETL

Source Applications

Extract Files

Profile
Integrate
De-duplicate
Reformat
Infer
Substitute

SAP

STW
STW – Wipro Data Team
IBM

STW
Field and Value Mapping

- Completed in a workshop led by STW data team members and involving:
  - Business Area experts
  - Legacy System experts
  - SAP Process experts (IBM)
  - Transformation Team (WIPRO)
  - Load Team (IBM)
- Output was a spreadsheet detailing each SAP object with the selection criteria, source data fields and transformation rules that need to be applied
- Basic mapping prepared prior to the workshop where possible.
Spreadsheet in three parts:

1. The SAP Object field taken from process design document - These were confirmed during the workshop

2. The mapping to the source legacy system tables & fields – confirmed and enhanced during the workshop

<table>
<thead>
<tr>
<th>SAP Field</th>
<th>Description</th>
<th>Usage</th>
<th>SAP Field Name</th>
<th>Type</th>
<th>Len</th>
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<tbody>
<tr>
<td>Transaction CJ06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Project definition</td>
<td></td>
<td></td>
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<td>Kind of project – Investment / Standard</td>
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<tr>
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<table>
<thead>
<tr>
<th>Source System</th>
<th>Source Table</th>
<th>Source Field</th>
<th>Source Type</th>
<th>Source Length</th>
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<td>CD_PROJ</td>
<td>CHAR</td>
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</tr>
<tr>
<td>AIMS</td>
<td>TAM045PROJECT</td>
<td>DS_PROJ</td>
<td>VARCHAR2</td>
<td>150</td>
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</table>
Field and Value Mapping – 3

3. Definition of the type of migration and the business rules for conversion – largely completed in the workshop

Basic Rules
- **Move** when Source field is directly moved to target without any transformation
- **Convert** when source field is converted before moving to target and a conversion rule is applied
- **Null** when nothing is to be moved into the target
- **Gap** when data needs to be created or collected by business area and moved into the target
- **Default** When a default value like 'EN' has to be moved to the target

<table>
<thead>
<tr>
<th>Migration Type</th>
<th>Fixed Value</th>
<th>Validation / Conversion Rule</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convert</td>
<td></td>
<td>Concatenate &amp; include space after AD_PC_DIST. If null populate with &quot;X11 1XX&quot;</td>
<td>Possibility that full PC doesn't exist</td>
</tr>
<tr>
<td>Default</td>
<td>D001</td>
<td>Config Data - only one profile will exist</td>
<td></td>
</tr>
<tr>
<td>Convert</td>
<td></td>
<td>See translation table</td>
<td>S:\SAP\WFM\Trans Tables\A2.xls</td>
</tr>
</tbody>
</table>

Review of what was left behind in the legacy application to ensure there weren’t any gaps
Migration Management –
Data Object Sign Off Process

- Practised formally in Dress Rehearsal
- Standard E-mails will be sent to Task owners at each stage of the ETL cycle
- Formal approval necessary to begin the Transform and Load
- Formal approval of reconciliation tasks post load before progressing dependant data Loads
- Supporting documentary evidence must be provided
- Physical Sign-off required by Programme and Business Data Object Owners from PMO
- Delay in sign-off could significantly impact the Cutover window as subsequent steps cannot be started until sign off is achieved
- Resource availability is critical to progress through this cycle
Once the Dust Had Settled…

- What Did We Achieve
- What Worked Well
- What Would We Do Differently
- Post Go-Live View
- Lessons Learned
What Have We Achieved

- Went live on time and on budget!
- Sign-off criteria for all data objects achieved
- Had a GREEN rating for data migration from external auditors (Ernst & Young)
- Successful financial audit by Deloittes for transition from our legacy Oracle application to SAP.

<table>
<thead>
<tr>
<th></th>
<th>Release 1</th>
<th>Release 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Discrete Data Loads</td>
<td>139</td>
<td>382</td>
</tr>
<tr>
<td>Number of Full volume Data Migration Cycles</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Number of data sources</td>
<td>28</td>
<td>17</td>
</tr>
<tr>
<td>Number of records</td>
<td>500K</td>
<td>70M</td>
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</table>
What Worked Well

• One Team Approach – including off-shore
• Embedding Data Analysts in each workstream ensured that migration was an integral part of the workstream activities
• Managed to deliver timescales for data migration as a critical path item throughout the programme
• Daily “Scrums” for communications – made sure everyone knew what we were doing, issues immediately flagged & addressed
• The emphasis on not migrating historic data meant we were able to manage expectations and scope
• Having a governance framework helped to achieve better integration with other programme teams, bring out information issues and drive resolution
• Ensured success and hard work were rewarded.
What We'd Do Differently Next Time

• Greater focus on integration points

• More STW data team members

• Configuration decisions have a large impact on on-going data maintenance. Need to understand this and not rely solely on advice from implementation partners

• Keep tighter control of configuration value changes

• Ensure system testing covers the full range of data variants being migrated

• Ensure changes to overall solution are only made after assessment of impact on migration
Post Go-Live View

- Very positive – we went live on time and to budget

- SAP Processes are working

- Many STW Data Team members now have new roles in organisation, the experience they gained has proved valuable

- Data quality & data gaps (e.g. grid references) often worse than expected

- Now working through and fixing data issues resulting from:
  - Inadequate validation & reconciliation
  - Source data quality / gaps
  - Known errors that were accepted for post go-live resolution
Lessons Learned

- Have a separate data team & use your best internal people
- Run migration like a military operation
- Improve data quality beforehand – not during migration
- Quality of validation and reconciliation must be robust from the first test cycle
- 5 cycles were needed to get it right
- Expect original scope list to expand to include variants
- Get Winshuttle as early as possible
- Make sure programme and business data owners understand their responsibilities at an early stage
- Try to avoid individuals who are single points of failure – the Icelandic volcano stranded some key resources overseas at a critical point
- Expect to work all hours – watch for people getting stressed
- Don’t think you’ve finished once you’ve gone live!
The End!

• Any questions?