Sustaining Data Quality -- Lessons from the Field

ABSTRACT

The presentation is a case study based upon a data quality improvement initiative carried out within a diverse organisation operating an integrated ERP system. This study identifies that lasting data quality improvements result from enhanced business processes and the training and development of people, to gain an understanding of the issues and problems and their ultimate resolution, thereby learning from the corrective actions, to aid future progress. In this his way any initiative has an opportunity to become self-sustaining rather than a continual clean-up exercise. Lessons learnt:

- Top-down support required for the bottom up improvement initiatives
- Provide regular visible measures and monitor progress
- Build data quality targets into peoples' objectives
- Ascertain root causes of issues and resolve problems at source
- Take it slowly to ensure everyone is onboard, identify ownership and responsibility and provide continual support

BIOGRAPHY

Tony O'Brien
Finance Manager
Remploy

Tony O'Brien is a Finance Manager within Remploy, the largest provider of employment opportunities for disabled people within the UK. He has over thirty-eight years experience within the fields of Finance and IS and has been involved in the implementation and development of a number of Enterprise Resource Planning (ERP) systems. He is currently completing a doctoral thesis focusing upon sustaining data quality within planning and information systems, with particular regard to organisations employing disabled people. He is also the Moderator of the International Association for Information & Data Quality's (IAIDQ) 'Ask the Expert Forum'.

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Sustaining Data Quality: Lessons from the Field

Tony O'Brien
The 4th Massachusetts Institute of Technology
Information Quality Industry Symposium

14th-16th July 2010

Setting the scene

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- A journey of discovery of lessons learnt based on practical experiences, supported by academic research- as a case study within a diverse organisation operating an ERP System
- A doctoral research programme combining theory and practice to bring about professional and managerial change
- We are all here to improve the quality of our data…but perhaps more fundamentally… how can it become embedded?
- Research Question

"How can an organisation create an environment where data quality improvements can be sustained?"

Sustainability

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- What do we mean by 'sustaining' or 'sustainability'?
- Is it a 'journey' or a 'destination'
- Maintain the *actual* improvements made so far, a stake in the ground- a 'destination'
- Maintain the *momentum* of the improvements made so far, by continuing the trend and thereby looking to improve further- a 'journey'
- It's a Journey- to stand still will lead to decline

The Organisation: Remploy

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- Mission- To expand the employment opportunities for disabled people in sustainable employment within Remploy and the communities it serves.
- Supported by UK Government (Department of Work and Pensions)
- Manufacturing Operations- 54 factories
- Employment Services- 34 branches
- Operating an full ERP system- Baan implemented in the late 90s

Quality Data Improvement

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- Originally seen as important… but more as an aspiration… with local ad hoc initiatives to resolve re-occurring problems rather than an enterprise-wide programme. Then with..
- Evidence of 'issues' with financial implications published regularly
- Changes in corporate structure to focus more on a product based business model..added complexity
- Tighter month-end closure & reporting timetable- 10 days down to 3 within a three year period.. little time for 'data clean up'

Quality Data Improvement

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- New BI & budgeting tool with far more structured reporting with a complex operation
- Seen as 'key' to a number of important Corporate projects
- Recognition of the need for quality data at source
- Data Quality Improvement Project launched in 2005
- The journey begins…
- At the pace of Paula Radcliffe rather than Usain Bolt.. But the distance isn't 100 metres

Conceptual Process Model

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Conceptual Overview
Generic Manufacturing Information ERP
Process System System Environment
Inputs Raw materials Raw data People/Processes/Data

Processes/
Operations Assembly line Information system ERP Database
Outputs Physical products Information products Information-People
Sources: Wang (1998: 59) Orna (1996)

- Scope for applying TQM principles to data quality
- Note that there *are* differences between the Manufacturing and Information models particularly around outputs

Conceptual Framework

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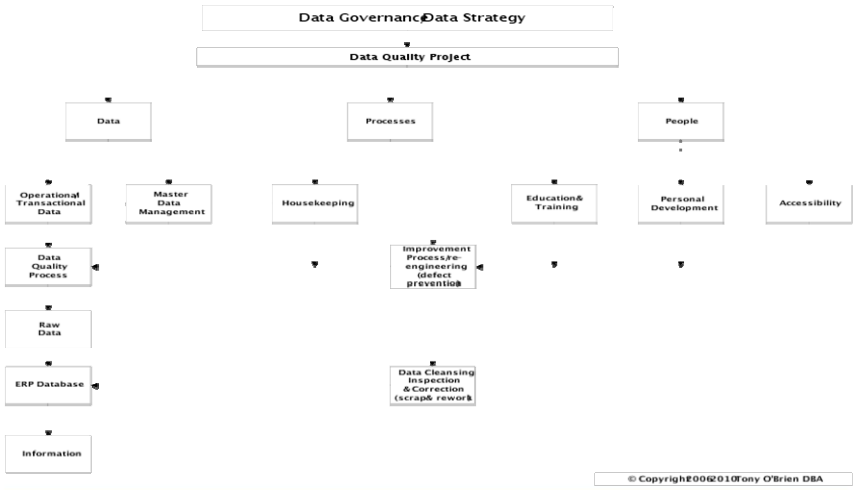

What Levels of Data Accuracy are Necessary?

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Demand Data MRP etc	60%	100%	100%	100%
Planning Parameters	30%	90%	95%	97%
BOMs & Routings	90%	95%	99%	99%
Stock Accuracy	50%	90%	95%	98%
Order Accuracy	50%	90%	95%	97%
Overall Accuracy	4%	68%	84%	91%
Error Rate	24 in 25	1 in 3	3 in 20	1 in 12

Source: Goodfellow, (199: 18)

Inventory Balances 95%
Production/Purchase Orders (Housekeeping) 98%
Stock Allocations 97%
Bills of Materials & Routings 98%
Customer Orders 98%
Source: Wallace et al., (2001: 195-217)

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Data Quality Improvement Project

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- Launched at a Finance Conference Autumn 2005 with executive sponsorship (Director of Finance) focusing initially on:
- Selling the initiative
- Education and training
- Review financial processes
- Ownership and responsibility for data
- Master Data (Cleansing!!)
- Measurement- essential to any improvement process- KPIs
- Finance community to cascade the initiative through each business

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Measurement- Key Performance Indicators

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- Seven KPIs established around key crucial commercial operations within an ERP system and previously identified as sources of data quality issues:
  - Two external- relating to customers and suppliers
  - Five internal- relating to order progression and fulfillment
  - Measured at factory and business levels
  - Monitored by way of a Weighted Index
  - But not *just* highlighting 'issues'- identifying 'good practice'

Measurement- Roll Out

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- Site and business indices distributed weekly/monthly to:
- September 06 Finance Community and Exec
- September 07 Added Business Managers
- September 08 Added Operations Manager
- January 09 Added Factory Managers
- January 08 Included within Quarterly Business Review meetings (Businesses and Exec)
- December 08 Quarterly business targets set

Extension of the Initiative

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- Between December 08 and April 09
- Meetings with all 50 plus factories and business offices via individual site visits
- Covered KPIs and general data quality issues
- Discussion points agreed between all parties and distributed
- Results summarised and shared with the businesses
  - Guidelines as to best practice
  - Issues identified
  - Suggestions for future progress

  Seen by everyone as very positive

Guidelines and Issues

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- Best Practice guidelines- at site and business levels
  - Hold regular site review/planning meetings at least weekly
  - Provide visibility of the measures and monitor progress
  - Focus initially on the five internal site-specific measures
  - Review progress at business level with each site on a monthly basis
  - Awareness of the importance of quality data and 'getting it right first time'
- Identification of Issues
  - There are training requirements and gaps in peoples' knowledge
  - Requirement for 'key' personnel at site and business levels- to provide business specific support
  - Communications within and across sites/businesses
  - Potential for sub-optimisation

Overall Index Improvement

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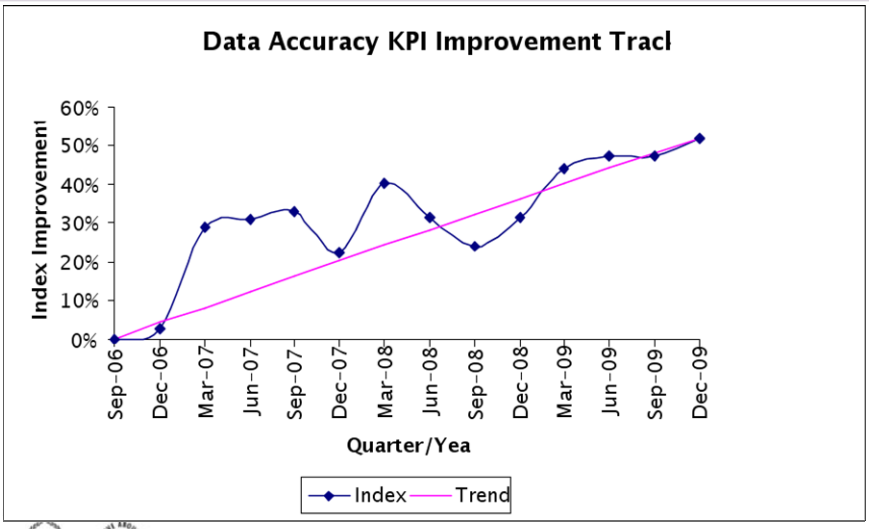

Overall Progress

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- Individual site/business indices aggregated to a Company figure to measure overall month-on-month movements
- Seen as 'indicative' of the progress towards improved quality data
- Summary of progress:
  - 29% improvement in the first six months to March 07
  - 16% improvement in the year to March 08
  - 27% decline in the six months to September 08- which coincided with the Company's Modernisation Programme
  - 32% improvement in the year to September 09
  - 52% improvement over the three years
  - 70% Improvement in supplier invoice 'first time match rate'

Quantitative Study

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- A web-based internal questionnaire was undertaken in June 09 to study reaction to the data quality programme
- Circulated to 111 recipients of the monthly KPI reports- 45 responses.. 41%
- Summary of results:
  - 85% Identified that problems with master data and transactional data seriously impacts a company's operation
  - 81% Identified that people who provide and process data have a serious impact upon data quality
  - 93% Identified that process problems seriously impact upon the quality of data
  - 88% Identified that poor data entry and lack of knowledge and training are major causes of data quality problems
  - 97% Identified that 'root cause analysis', 'up front error prevention', 'identify and clean errors at source' are important in resolving DQ problems
  - 82% Believe they have the ability to influence the quality of their data and provide quality data to others
  - Overall in line with a 'Data Quality Professional' survey in 2007

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Culture Change

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- Journey
- "What gets measured gets done"
  - A good start, but by whom?
- "What gets measured by the Exec gets done quicker"
  - A further improvement, but too top-down
- "What is measured, communicate, discussed and agreed at all levels has a very good chance of becoming embedded
  - Bottom-up supported by top-down
  - A potential key to sustaining any type of change?

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Motivational Factors for Improvement

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- Belief that it will:
  - Improve efficiency
  - Help control their factory
  - Supports their principles
- Competition between colleagues- site/business
- 'League Table' Syndrome
- Requirement to achieve monthly/quarterly targets
- Distinct movement from "I'm gonna get my axx kicked" to " My life is better for doing it this way"

Lessons Learnt

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- Take it slowly to ensure everyone is onboard- identify ownership/custody and responsibility. The businesses 'own' the data- culture change/paradigm shift
- Provide regular visible measures and monitor progress
- Top-down support required for bottom-up improvement initiatives- involving middle management
- Build data quality targets into peoples' objectives
- Ascertain root causes of issues and resolve problems at source
- Identify how the 'measures' will improve the quality of the data and thereby support the corporate objectives

Deciding Factors

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- Sell the concept up and down the organisation
- Attitude & willingness at all levels to embrace something new
- Senior management sponsorship & involvement
- Measurement of progress & the publication of the results
- Cultural issues
- System & structural changes can prevent a return to type
- Have an 'internal champion' who has the respect of the audience

Going Forward

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- Has the quality of the data improved? Looks like it
- Is the improvement being sustained? Only time will tell
- A never ending journey
- Its really down to 'People'
- We are a 'People' Business
- Re-enforce the principle of data being an enterprise-wide asset

Final thoughts

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- Stated aim to combine theory and practice to create new knowledge and bring about organisational change
- Challenge: to reciprocate the process by incorporating the findings into the body of academic knowledge…'Engaged Scholarship'

Source: Van de Ven (2007)

- Questions?
- I'm looking for feedback and discussion so please feel free to contact me at anytime
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References

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