Information Quality Program Implementation

Mike Lampa

Contact Info:
mlampa@teamdna.com
972.467.7788
Agenda of Topics

- The Total Information Quality Process
- The Premise of Process
- But Where do we Start?
- Modeling the Enterprise Business Processes
- Using Process Models to Drive Information Quality Solutions
The Total Information Quality Management (TQIM®) Process

P1 Assess Data Definition & Information Architecture Quality

P2 Assess Information Quality

P3 Measure Cost & Risk of Non-Quality

P4 Reengineer & Correct Data

P5 Improve Information Quality Process

P6 Establish Information Quality Environment

Larry English – Total Information Quality Management Process

TQIM® is a Registered Trademark of INFORMATION IMPACT International, Inc.
But Where Do We Start?
Corporate Data Governance Pyramid

- Business Performance Management
- Information Quality Management

- Stewardship Metadata
- Business Transaction Data
- Business Transaction Process
- Performance Monitor
- Quality Monitor
- Governance
- Risks
- Goals
- Measures
What Data should be Addressed?  
Where do we start?

- Develop Performance Risk Model
  - Map Performance Measures to Quality Measures
  - Map Regulatory Compliance Measures to Quality Measures
  - Map Link = Business Transaction Data in Common
- Prioritize the Performance & Regulatory Compliance Measures
  - What could put you out of business?
  - What could put you in jail?
  - What could chase your customers away?
- Commission a Data Assessment Team
Mapping the Risk Model

- Corporate Performance Measures, Regulatory Compliance Measures & Data Quality Rules are linked via the business transaction Data they share in common.
Monitoring Quality Trends

- Capturing Periodic Assessments of Quality Rule compliance is key to identify improvement/erosion trends
- Trending is key to establishing an effective monitoring and alerting procedure
Data Quality Trend Reporting
How do we determine Data Quality?

• Must understand the total life-cycle of the Data Asset.
• Need a functional understanding of Data asset – how does it serve the organization’s business objective?
  – How is the Data created? Who is responsible for the creation?
  – What is the source of the Data? Who is the source of the data?
  – How is it used? – Who uses it?
• Need a systems understanding of the Data asset
  – What does the Data actually contain?
  – When does the Data get interrogated? What is done with the interrogation results?
  – What systems enforce edits? What is done with the edit results?
Modeling the Enterprise Business Processes
The Premise for Process

• Goal is to achieve Corporate Objectives
• Corporate Objectives are SMART
  – Specific, Measurable, Achievable, Relevant, Time-Based
• Key Performance Indicators (KPI’s) are lag-time/outcome measures.
  – Have objectives been achieved?
• Process Measures & Activity Measures are lead-time measures.
  – Predictive indicators for KPI outcome measures
• Regulatory compliance protects the enterprise from business risks.
• Key Quality/Compliance Measures ensure accurate reporting of performance & regulatory compliance.
• Business processes produce the information from which measures are derived and regulatory compliance is assessed.
• Enterprise-wide governance enforces implementation of behaviors & policies to ensure production of quality business information.
• Business Process Owners drive information quality compliance by defining quality control rules & implementing quality assurance practices.
• IT enables data quality compliance via institutionalization of rules & practices within information management & information delivery systems.
Business Modeling via “Facili-Modeling”

Gathering Technique

Capture Tool

Project Charter Document

Design Element

Business Context Diagram

Business Process Model

Business Information Model

Business Information Needs

Project Scope

Bus Purpose

Bus Performance

Enterprise Model

KPI’s & Measures

Project Purpose

Functional Scope

Quality Gov.

Data Integration

Process Measures

Systems Scope

S/T Mapping

BI Requirements
What is a Business Process Model?

- The Graphical Representation of the enterprise’s business execution life-cycle.
  - Defines the key business functions, processes and activities that take place day-to-day
  - Describes the interaction of those processes in the form of the information that is used by and shared among those functions, processes and activities.
  - Describes the association between those process and their enabling mechanisms (automation systems and organizations)
- Represents “What” the Business Does, NOT “how” it does it
  - Is Absent of Organizational Structures
  - Is Absent the constraints imposed by capabilities of Automation Systems
Process Model Levels?

• Context Diagram
  • Provides a means to scope the business modeling effort in context of the scope of the project for which requirements are needed.

• Process Flow Diagram – Functional Level
  • Provides an “at a glance” view of the overall enterprise functional life-cycle.

• Process Flow Diagram – Process/Activity Level
  • Provides a more detailed view of the key business processes or activities that support a business function.
  • Usually 3-6 levels of decomposition is sufficient for Data Warehousing & Business Intelligence projects
  • Usually 7+ levels of decomposition is necessary for operational support system and operational information integration projects

• Swim Lane Diagram – Task/Execution Level
  • Provides a participant point of view of the processes and the interactions between participant pools and lanes
  • Can be used to drive out detailed operational system specifications and business intelligence cause and effect analysis.
Process Model Methods & Notation

• Integrated Definition for Functional Modeling (IDEF0)
  • A method designed to model the decisions, actions, and activities of an organization or system and to promote good communication between the analyst and the customer.
  • Useful in establishing the scope of an analysis, especially for a functional analysis, thus are often created as one of the first tasks of a system development effort.
  • Derived from the Structured Analysis and Design Technique (SADT) and commissioned by the United States Air Force.
  • In December 1993, the Computer Systems Laboratory of the National Institute of Standards and Technology (NIST) released IDEF0 as a standard for Function Modeling in FIPS Publication 183.

• Business Process Modeling Notation (BPMN)
  • A method designed to provide a notation that standardizes communications understandable by business users, business analysts and technical developers.
  • Useful means to provide a common notation to visualize XML languages designed for the execution of business processes, such as BPEL4WS (Business Process Execution Language for Web Services).
  • In June 2005, the Business Process Management Initiative (BPMI.org) and the Object Management Group™ (OMG™) announced the merger of their Business Process Management (BPM) activities to form the Business Modeling & Integration (BMI) Domain Task Force (DTF).
IDEF0 Context Diagram Components:

Using the IDEF0 Context Diagram Components, you can use to scope the modeling effort in the context of the project at hand.

- **Business Context**: The business that is the subject or context.
- **Goes Intas**: Goods/Services/Information that is received from Outsiders.
- **Goes Outas**: Goods/Services/Information that is delivered to Outsiders.
- **Subject Business**: The central focus of the context diagram.
- **Raw Materials**: Inputs to the business process.
- **Subscription Service**: Service that the business provides.
- **Supplier**: Entity providing goods or services to the business.
- **Customer**: Entity receiving goods or services from the business.
- **Outsiders**: The people, companies, and systems with which the business interacts.
Example IDEF0 Context Diagram

Identifies the high-level information inputs & outputs.
**IDEFO Process Flow Diagram Components:**

### The Anatomy of a Process Flow Diagrams

**Controls:** Information that influences a process, but is not manipulated by that process.

**Outputs:** Information that is the result of a process manipulation.

**Mechanisms:** The People or Systems that perform or trigger the process.

**Inputs:** Information that will be manipulated by the process.

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**Business Process Modeling Practical Approach:** Overview of Business Process Modeling Concepts
Example IDEF0 Functional Level Process Flow Diagram

Credit Request

Requested Credit Amount

Guarantor Info Request

Credit Analyst

CAW_2000

Obligor Details

Executive Agreement

Transaction Journal

Interest Paid

Funded Loan

Executed Agreement

Loan Payment

Credit Limit Amount

Loan Servicing

Approved Credit Detail

Foreclosure Workout Rules

Credit Approval Rules

Credit Laws

Sales Activity Management

A1

Loan Underwriting

A2

Loan Servicing

A3

Financial Management

A4

Provides view of information acting as controls & flowing between processes

Associates Business Processes to Application Systems

Associates Business Processes to Job Roles
Resource Management Cycle

- PLAN
- MONITOR
- CONTROL
- ACQUIRE
- UTILIZE
- DISPOSE
Application Systems Dependency Models
Application Dependency Model

- CRM (Siebel)
- LMS (Loan Management)
- FMS (Funds Management System)
- CBR (Credit Bureau Reporting)
- CAW_2000 (Underwriting)
- LPS (Loan Processing)
- OFA (Accounting)
- Regulatory Agency Feed
- Tax & Rate Rules
- AR Balance & Payments
- Risk Accounting
- Credit Scores
- Application Info
- Customer Name
- Customer Setup
- Loan Details
- Application Details
- Credit Decision
- Funding Source
## Application Heat Maps

<table>
<thead>
<tr>
<th>Appl Process</th>
<th>CRM</th>
<th>LMS</th>
<th>CBR</th>
<th>FMS</th>
<th>CAW_2000</th>
<th>LPS</th>
<th>OFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales Activity Mgmt</td>
<td>Cons</td>
<td>Sales</td>
<td>Cons</td>
<td>Cons</td>
<td>Credit</td>
<td>Ops</td>
<td>Ops</td>
</tr>
<tr>
<td>Loan U-Writing</td>
<td>Cons</td>
<td>Ops</td>
<td>Cons</td>
<td>Ops</td>
<td>Credit (All)</td>
<td>Ops (All)</td>
<td>Ops (All)</td>
</tr>
<tr>
<td>Loan Service</td>
<td>Cons</td>
<td>Ops</td>
<td>Cons</td>
<td>Ops</td>
<td>Financial</td>
<td>Cons</td>
<td>Corp</td>
</tr>
<tr>
<td>Fin Mgmt</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ops</td>
</tr>
</tbody>
</table>
Using Process Models to Drive Information Quality Solutions
Determining Data Ownership

- Data Stewardship is a function of Process Ownership:
  - Process Produces Data
  - Process Consumes Data
- Who should be involved in the assessment results review is a function of:
  - Process Ownership
  - Process Critical Dependency
Determining what needs to be done?

- Determine root cause of Quality Problem
  - Need for Training
  - Changes in Processes & Policies
  - Changes in Quality Rules
  - Changes in Systems
- Develop Implementation Plan
  - Identify People Resources
  - Identify System Resources
  - Develop Timelines
  - Develop Cost/Benefit Statement & Return on Investment
- Update the Program
  - Re-Prioritize the initiatives
  - Establish Execution Governance
DQ Cause and Effect Analysis

Using the Process Flow Diagrams

Determining the value of fixing the process where the flaw is introduced must be correlated to the cost of the eventual business impacts.

But you have to have an explicit understanding of the business model to find out where the flaw is introduced!

An Data flaw introduced at this processing stage...

... propagates through this processing stage...

... and ultimately impacts business results at these stages

An Data flaw introduced here may be relatively insignificant given current context & downstream impacts
Data Flaws Incur Business Impacts
– An Example

1. Slower turnover of stock
2. Stock write downs

3. Out of stocks at customers
4. Inefficiencies in sales promotions
5. Inefficiencies in sales promotions

6. Out of stocks at customers
7. Distribution errors and rework
8. Unnecessary deliveries
9. Extra shipping costs

Missing product id, inaccurate product description at data entry point

Product data is not standardized, multiple systems have inconsistent data
## Quantification Variables For Data Failures

<table>
<thead>
<tr>
<th>Problem</th>
<th>Issue</th>
<th>Business Impact</th>
<th>Quantifier</th>
<th>Yearly Incurred Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing product id, inaccurate product description at data entry point</td>
<td>Inability to clearly identify known products leads to inaccurate forecasts</td>
<td>Slower turnover of stock</td>
<td>Increased cost</td>
<td>$30,000.00</td>
</tr>
<tr>
<td>Stock write downs</td>
<td>Increased cost</td>
<td></td>
<td></td>
<td>$20,000.00</td>
</tr>
<tr>
<td>Out of stocks at customers</td>
<td>Lost revenue</td>
<td></td>
<td></td>
<td>$250,000.00</td>
</tr>
<tr>
<td>Inefficiencies in sales promotions</td>
<td>Speed to market (and lost revenue)</td>
<td></td>
<td></td>
<td>$20,000.00</td>
</tr>
<tr>
<td>Inability to deliver orders</td>
<td>Lost revenue</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inefficiencies in sales promotions</td>
<td>Speed to market (and lost revenue)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Distribution errors and rework</td>
<td>Staff time</td>
<td></td>
<td></td>
<td>$24,000.00</td>
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<tr>
<td>Shipping costs</td>
<td>Increased shipping costs</td>
<td></td>
<td></td>
<td>$78,000.00</td>
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<tr>
<td>Unnecessary deliveries</td>
<td>Staff time</td>
<td></td>
<td></td>
<td>$23,000.00</td>
</tr>
</tbody>
</table>
Researching Costs and Impacts

- Historical data associated with work/process flows during critical events can provide cost/impact details.
- Consult:
  - Issues tracking system event logs
  - Management reports on staff allocation for problem resolution
  - Interview key personnel
  - Review external impacts (e.g., stock price, management spin)
- Identify key quantifiers for business impact.
Assigning Quantifiers

- Evaluate actual costs (or revenues) based on quantifying variables
- Examples:
  - Count the number of extra hours of staff time are incurred when flaws require increased manual intervention
  - Costs duplicated when initial attempts fail (e.g., bad shipping address)
  - Sum up increased shipping, logistics, inventory costs
  - Assign probabilities to risk impacts
- Collect incurred costs as related to underlying problems (this will come in handy when prioritizing solutions)
Investments to Remediate

- Assess investments to develop and maintain a solution:
  - Tools
  - System design, development, implementation
  - Hardware
  - Maintenance
  - Staffing
## Assessing Solution Investment - Example

<table>
<thead>
<tr>
<th>Problem</th>
<th>Issue</th>
<th>Solution</th>
<th>Software</th>
<th>Staffing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing product id, inaccurate product description at data entry point</td>
<td>Inability to clearly identify known products leads to inaccurate forecasts</td>
<td>Parsing and Standardization, Record, monitoring linkage tools for cleansing</td>
<td>$150,000.00 for license 15% annual maintenance</td>
<td>.75 FTE for 1 year .15 FTE for annual maintenance</td>
</tr>
</tbody>
</table>
Developing Business Case

- Bring the Business Benefits & Implementation Investments together
- Secure endorsement of Business Benefits by Business Sponsor & IT Sponsor
- Get Finance involved to develop the Financials
  - Validate numbers
  - Assign benefit method (ROI, Payback Period)
- Get Program Office involved to recommend/prioritize initiative to executive management
Summary Points

• The TIQM ® Methodology has at it’s core a critical dependency on understanding process.
  – The TIQM® process
  – The Business Processes that Produce and Consume Information

• Information is the empirical means to measure performance and assess quality, BUT Information is a by-product of Process.

• Modeling the Business Processes provides a consistent, enterprise-wide approach to documenting complex Information Quality rules

• Business Process Models provide valuable insight during the analysis of the cause & effect due to poor Information Quality on the business processes AND Application Systems.
Thank You!