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## The Business Value from Data Quality

ICIQ  
15<sup>th</sup> International Conference on  
Information Quality  
Nov. 13, 2010  
1:45 – 3:15 p.m.  
UALR – Little Rock, Arkansas

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1

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2

## Assumptions About This Audience

You already know that:

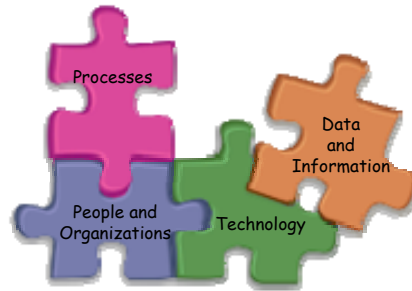
- Information quality is important
- We have the responsibility to give equal emphasis to the quality and management of the data and information as we do to the processes, people and organizations, technology, and other resources that support our businesses

You are interested in:

- How to show others that data quality is important

You are ready and willing to:

- Participate and learn!



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3



### Foundational Concepts

- Ten Steps™ Process Used in the Case Study
- Case Study – Sallie Mae
- Summary and Next Steps

## TODAY'S AGENDA


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4

## Foundational Concepts are Necessary

He who loves practice without theory is like the sailor who boards ship without a rudder and compass and never knows where he may cast.

— Leonardo da Vinci



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## How is Information Like Other Resources?

**Information Has Value and Needs to Be Deliberately Managed**



**Human Resources**



**Financial Resources**



**Information Resources**



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6

## Showing the Value and Impact to Business

What impact do data quality and governance have on the organization? On me? On my responsibilities? Why do they matter?



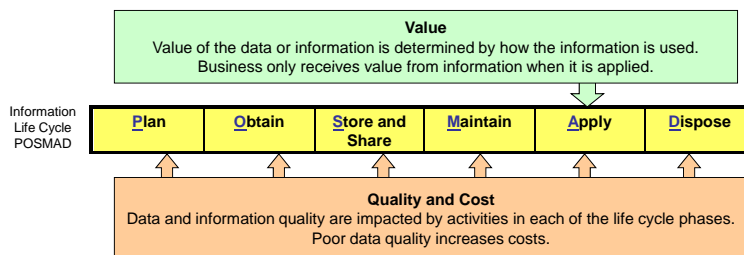
- These are the right questions!
- But historically they have been difficult to answer
- We will discuss how to answer these questions by assessing business impact (value) of information/data quality and data governance

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7

## Where to Assess Business Impact

- All information has a life cycle – Plan, Obtain, Store and Share, Maintain, Apply, Dispose (POSMAD)
- Focus on activities in the **Apply** phase of the information life cycle POSMAD and look at how the information is **used**
- There is also business impact when **costs** are created due to poor quality data
- Impact to the Apply stage usually shows the greatest value from data quality

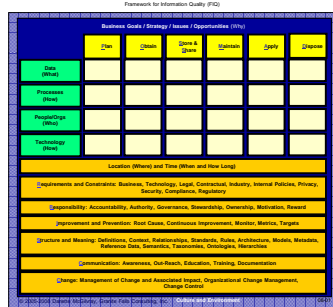


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8

# The Ten Steps™ Methodology

## Framework for Information Quality and Other Key Concepts



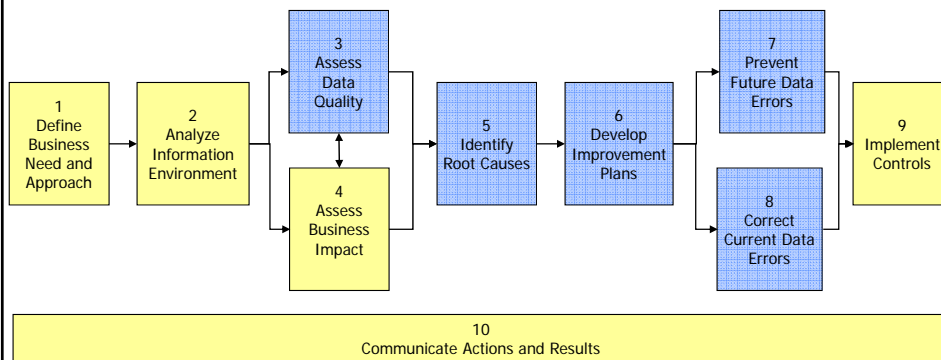
- ▶ Provides the foundation for understanding information and data quality
- ▶ Necessary fundamentals to apply the Ten Steps process to your specific situation

## Ten Steps Process



- ▶ Concrete instructions for implementing, improving, and creating data quality
- ▶ Process for implementing framework and key concepts
- ▶ Contains examples, templates, techniques, and advice

# The Ten Steps™ Used in the Case Study



Focus of this presentation

## After Concepts Comes Action

I have been impressed with  
the urgency of doing.  
Knowledge is not enough; we  
must apply. Being willing is not  
enough; we must do.

— Leonardo da Vinci



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11

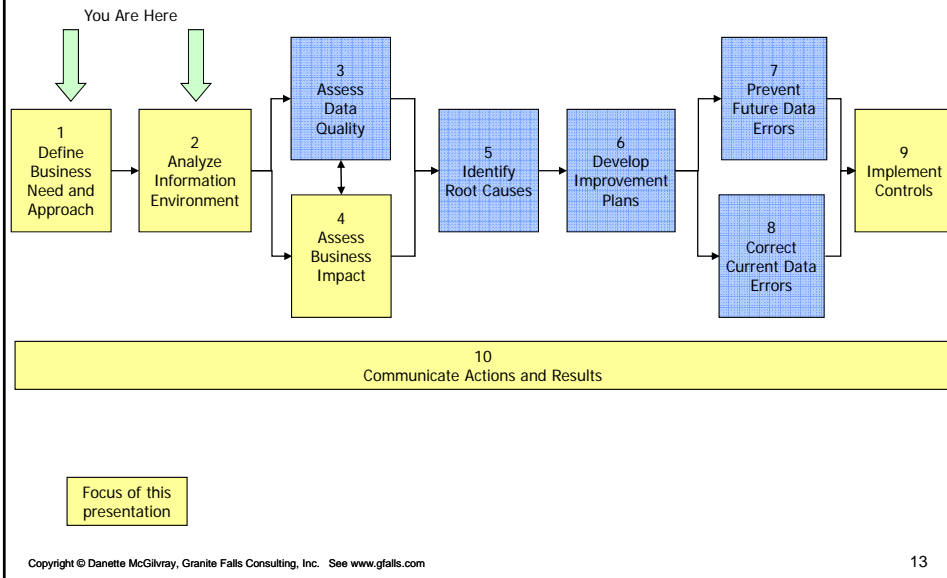
- Foundational Concepts
- ➔ Ten Steps™ Process Used in the Case Study
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## TEN STEPS™ PROCESS USED IN THE CASE STUDY

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12

## Preparing to Assess Business Impact

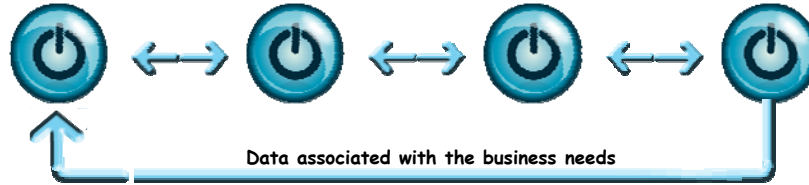


## Preparing to Assess Business Impact

- State what you are trying to accomplish overall with your data quality initiative and why
- Describe what is within scope of your business impact assessment. (Start at a high level and move to more detail as needed.)
  - Data and information
  - Processes
  - People and organizations
  - Technology
- Connect business needs to data (see technique on following slide)
- Have enough background to be able to describe your situation and needs
- This will guide your decisions and actions throughout assessing the business value

## Danette's Connect-the-Dots Technique

Business-to-Data and Data-to-Business



### Business Needs:

- Goals
- Strategies
- Issues
- Opportunities
- Why

### •Processes

- People/  
Organizations
  - Technology
- associated with  
business needs

Information  
that supports  
processes,  
people/  
organizations,  
or is used in  
the technology

Data that  
makes up the  
information

## Best Practice



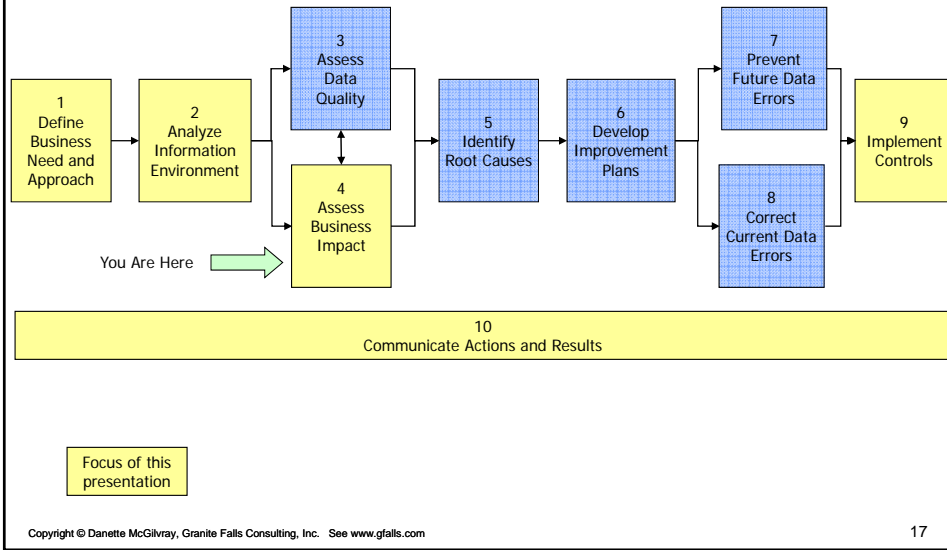
- Do not skip these steps!
  - Step 1 - Define Business Need and Approach
  - Step 2 - Analyze Information Environment
- This presentation is focused on Step 3 – Assess Business Value, but this assessment cannot be done well without first doing Steps 1 and 2.

**“Just enough planning to optimize results. Not a drop more! ... But not a drop less either.”**

-- Kimberly Wiefeling, in *Scrappy Project Management™*:  
*The 12 Predictable and Avoidable Pitfalls Every Project Faces*



## Step 4 – Assess Business Impact

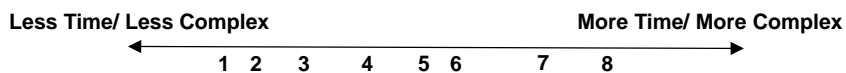


## Business Impact Techniques

Quantitative and qualitative techniques for assessing the impact of data quality on the business

Business Impact Techniques	
1. Anecdotes	5. Ranking and Prioritization
2. Usage	6. Process Impact
3. Five “Whys”	7. Cost of Low Quality Data
4. Benefit vs. Cost Matrix	8. Cost-Benefit Analysis and ROI

### Continuum of Relative Time and Effort



## Business Impact Techniques Brief Definitions

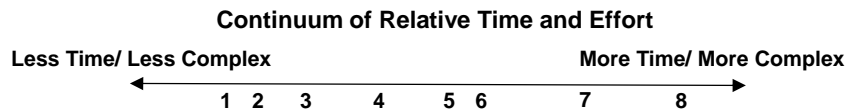
1	Anecdotes	Collect examples or stories of the impact of poor data quality.
2	Usage	Inventory the current and/or future uses of the data.
3	Five "Whys"	Ask "Why" five times to get to real business impact.
4	Benefit vs. Cost Matrix	Analyze and rate the relationship between benefits and costs of issues, recommendations, or improvements.
5	Ranking and Prioritization	Rank impact of missing and incorrect data to specific business processes.
6	Process Impact	Illustrate the effects of poor quality data to business processes.
7	Cost of Low Quality Data	Quantify the costs and revenue impact of poor quality data.
8	Cost-Benefit Analysis	Compare potential benefits of investing in data quality with anticipated costs through an in-depth evaluation. Includes Return on Investment (ROI) – profit from an investment as a percentage of the amount invested.

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19

## Choosing Which Techniques to Use

- Use the techniques that best fit your situation, time, and resources available
  - Many of the techniques work together or can be used alone
- The continuum shows relative effort – not relative results:
  - You can understand business impact even without completing a full cost/benefit analysis
  - Less complicated does not necessarily mean less useful results
  - More complex does not necessarily mean more useful results
  - The best results come from using the techniques most appropriate to your situation



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20

## Using Business Impact Results

Use results from assessing business impact to:

- Establish the business case for information quality
- Gain support for investing in information quality
- Determine the optimal level of investment

At any time, you may need to assess business impact to gain or sustain support.

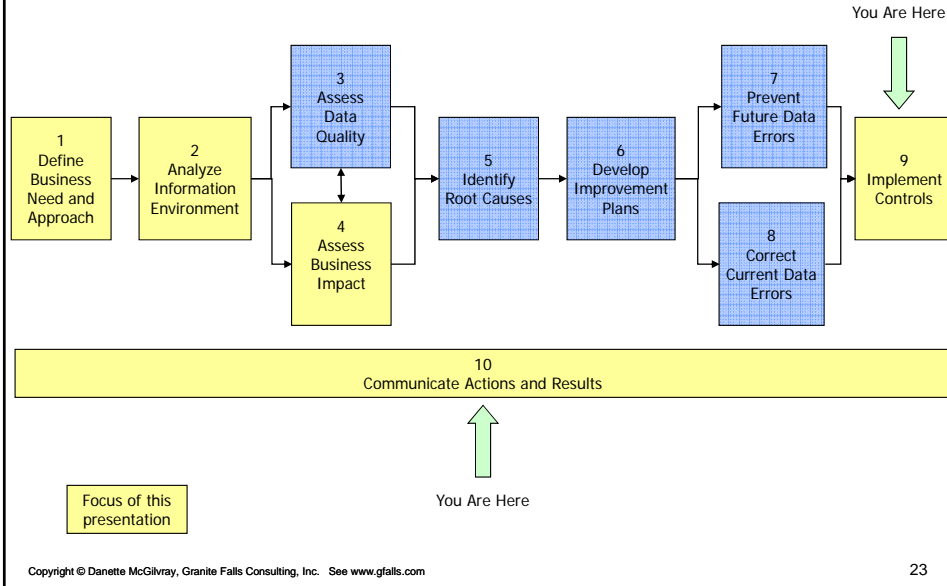


## Best Practices



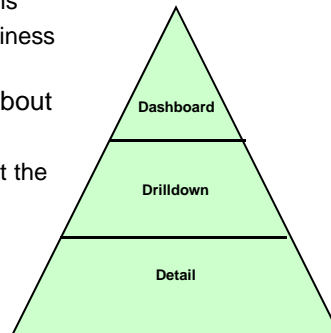
- You don't always have to do an in-depth analysis to get good results
- You may take only one aspect of the examples or one event and still get actionable information
- Extend results of qualitative business impact techniques with additional research to gather and calculate numbers (for example, quantify the process impact)

## Steps 9 and 10 – Implement Controls and Communicate



## Metrics

- Metrics are useful for
  - Replacing opinions with facts
  - Determining where to focus resources and efforts
  - Identifying sources of problems
  - Confirming the effectiveness of solutions
  - Encouraging behavior that support business objectives through information quality
- When planning your metrics be clear about
  - Your goals for using them
  - Actions that will/should result from what the metrics tell you
  - Their impact on the business and individuals' behavior



## Metrics – Levels of Detail

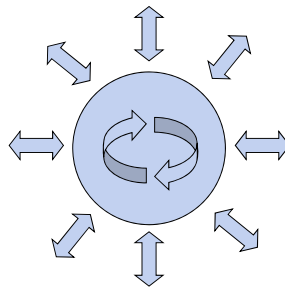
Level	Audience	What it provides
<b>Summary or dashboard level</b>	Management is the primary audience, so integrate your data quality metrics into other business dashboards for best results. Resources for designing an effective dashboard for your information metrics: <ul style="list-style-type: none"> <li>• <i>Information Dashboard Design</i> by Stephen Few (O'Reilly)</li> <li>• <i>Performance Dashboards</i> by Wayne W. Eckerson (Wiley).</li> </ul>	Easy visual glance at and interpretation of metrics such as targets, actual data quality, and status.  Status indicates the condition of the metric in easy-to-understand terms and should drive action. For example: <ul style="list-style-type: none"> <li>• Green = results meet or exceed target</li> <li>• Yellow = results fail target or unfavorable trend</li> <li>• Red = results well outside of tolerance limits or drastic unfavorable change</li> </ul>
<b>Drilldown</b>	Managers interested in next level of detail. Other individual contributors such as data or business stewards who want a summarized view of the detail.	A mid-level view that provides additional information about the dashboard metrics such as trends and history.  This is useful to show more about the dashboard numbers—but not in excruciating detail.
<b>Detailed reports</b>	Project or functional teams which use them to monitor and fix data. Detailed reports are not normally viewed by management, but should be available if questions arise.	Detailed measurements and actual records from which the metrics are summarized.  Actual records with exceptions to the data quality test so teams can correct the data.  Input for root cause and continuous improvement.

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25

## Full-circle Communications

- Communications take a “full-circle” approach by ensuring *relevant* communications and interaction with *appropriate* audiences
- Consider:
  - Upward to management to your direct reporting chain and their peers
  - Downward to those in the direct reporting chain and their peers
  - Out to colleagues
  - Within the internal data organization



Full-circle Communications

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26

## Communication Plan

Audience	Message and Desired Action	Trigger	Communication Vehicle	Development	Delivery	Other Action	Target Date	Complete Date

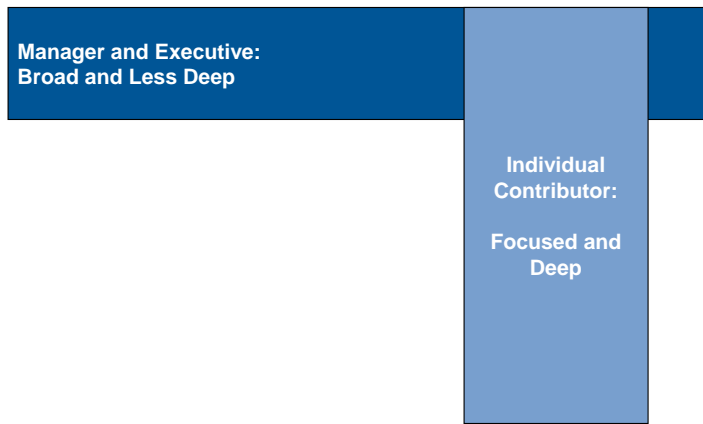
- Build your plan early in your project or initiative
- Start with what you know. For example, start by listing:
  - Communication vehicles in your organization OR
  - All your audiences OR
  - Specific messages and desired action
- Modify the template to meet your needs
- Use, update, and refer to your plan to remind you to communicate
- Capture results, feedback and action items from your communications – and follow-up

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## Communication Differences

- How can understanding these differences help you communicate more effectively?



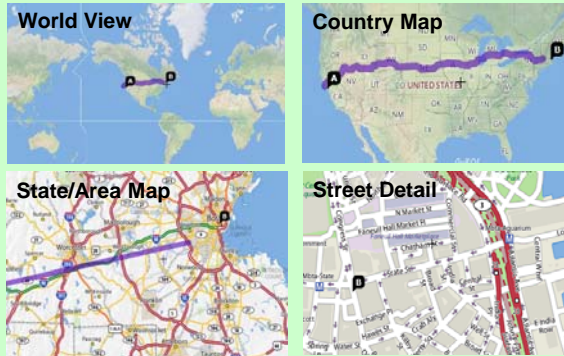
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28

## Best Practice



- Key decision - choose the right level of detail for each step chosen and your various communications. What is the right level of detail?
  - It depends ... on where you are, where you want to go, your concerns, your audience. Sometimes you need:



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- Foundational Concepts
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- Summary and Next Steps

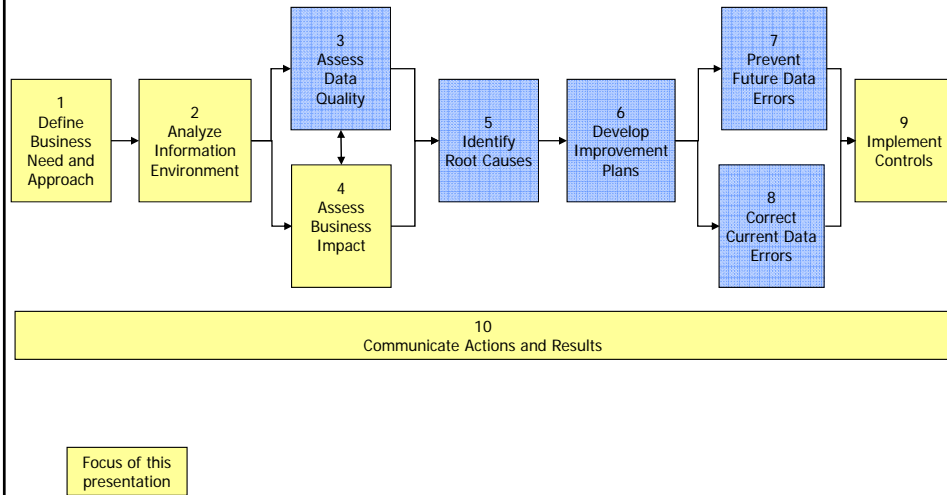
## CASE STUDY – SALLIE MAE



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## The Ten Steps™ Used in the Case Study



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31

## Sallie Mae Background

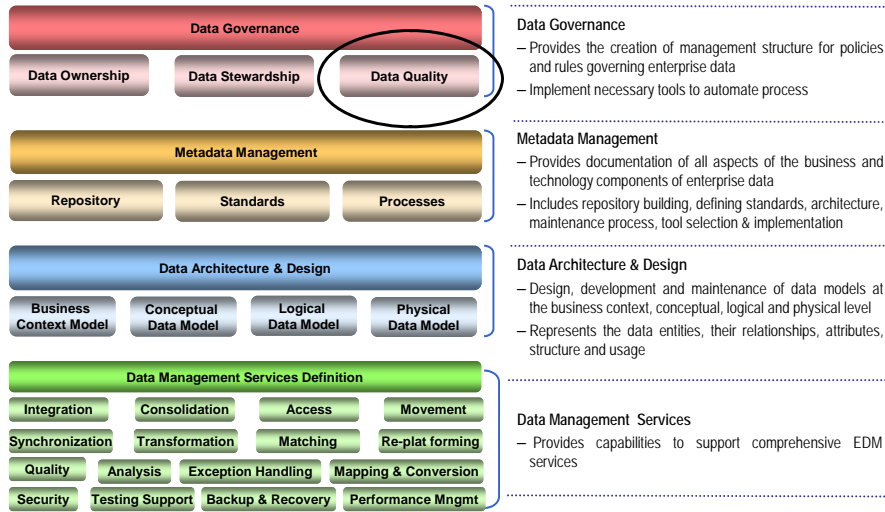
- Sallie Mae is the nation's leading provider of saving, planning and paying for education programs. Since its founding more than 35 years ago, the company has invested in more than 31 million people to help them realize their dreams of higher education.
- Sallie Mae manages \$188 billion in education loans and serves 10 million student and parent customers. Through its Upromise affiliates, the company also manages more than \$19 billion in 529 college-savings plans, and is a major, private source of college funding contributions in America with 11 million members and more than \$500 million in member rewards.

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32



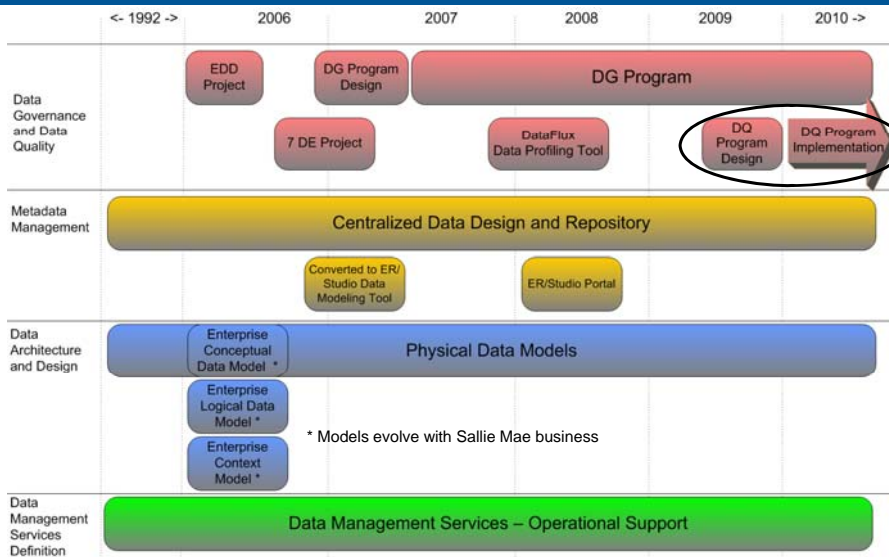
# How DQ Fits into the Enterprise Data Management Strategy



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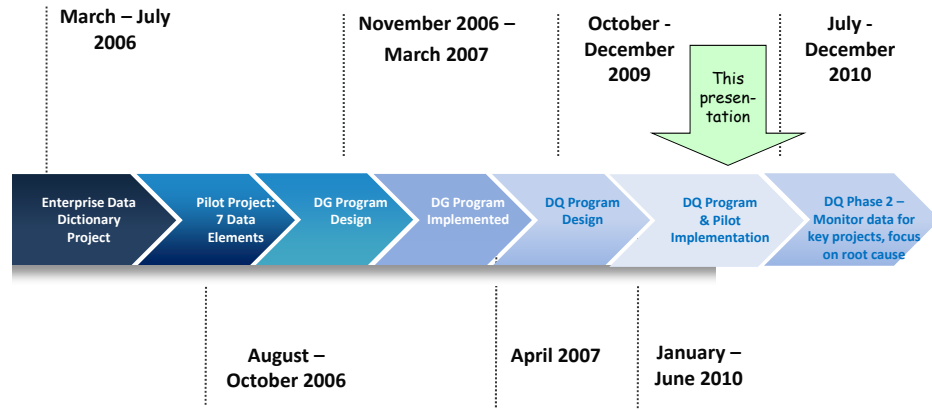
# Data Management Strategy Timeline



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## Data Quality – How We Got Here



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## Business Impact Techniques Used in Case Study

1	Anecdotes	Collect examples or stories of the impact of poor data quality.
2	Usage	Inventory the current and/or future uses of the data.
3	Five “Whys”	Ask “Why” five times to get to real business impact.
4	Benefit vs. Cost Matrix	Analyze and rate the relationship between benefits and costs of issues, recommendations, or improvements.
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Techniques used in the case study

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36

# Using Technique 1 - Anecdotes

## 1. Collected examples using Ten Steps™ Anecdote template

Title:	People:
Date:	Technology:
Process:	
Scenario:	
Impact: (Quantify wherever possible)	
Initial recommendations or next steps:	
Submitted by:	Date:
Submitter phone:	

## 2. Compiled and summarized examples

- **Increase Revenue**
  - Facilitate specific product lines speed to market
  - Improve servicing performance resulting in an increase of our volume percentage awarded under the contract
  - Increase volume available for the PUT process and Trusts
- **Manage Cost and Complexity**
  - Eliminate data reconciliation efforts and manual workarounds
  - Reduce operational servicing costs
  - Set the stage for Service Oriented Architecture (SOA)
  - Implement enterprise architectural improvements (e.g. person matching)
- **Reduce Risk and Support Corporate Compliance Initiatives**
  - Address the enterprise data elements, resulting in improved quality and assurance, risk management, and corporate compliance
  - Improve company-wide communications regarding data (increase consistency)
  - Improve identification and documentation of identity fraud

## 3. Further summarized for management presentation



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# Using Technique 3 – Five “Whys” for Business Impact

From asking the questions ...

- **Issue:** We have inconsistent benefit profiles
- **Why does that matter?**
  - It means there will be inaccurate benefits on the loans
- **Why does that matter?**
  - This means SLM has to spend time correcting the loans
- **What does that affect?**
  - It means that loans were delayed from going through the PUT process
- **What difference does that make?**
  - This decreased our revenue by increasing our funding costs

... to presenting results

## How Do Data Quality Issues Impact SLM?



**NOTE:** If there had been an emphasis on DQ and value placed on information resources these situations could have been avoided

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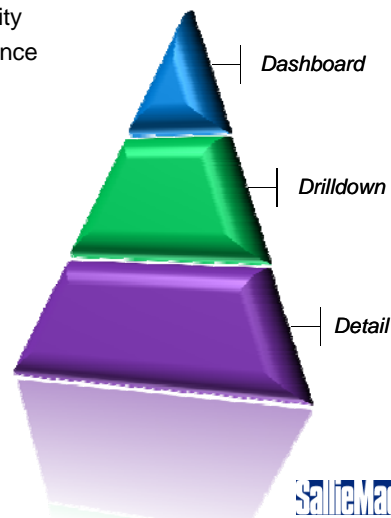
## Best Practice



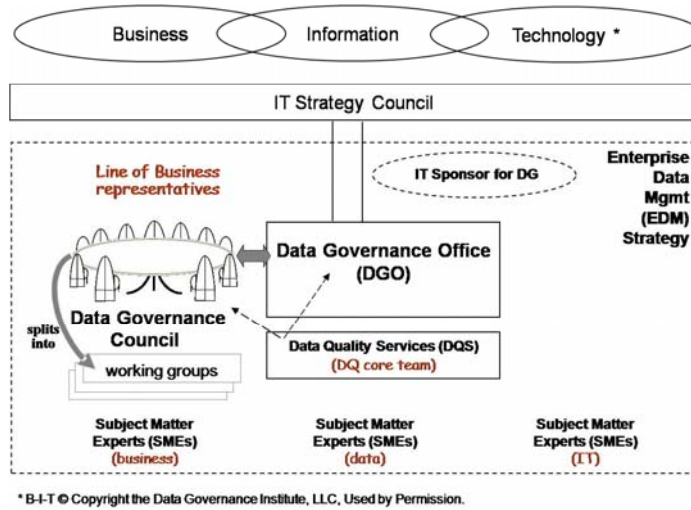
- Use the following fundamental techniques together with most of the other business impact techniques. Improve your ability to:
  - Collect and tell stories (Technique 1 – Anecdotes)
  - Ask the next deeper question (Technique 3 – Five “Whys” for Business Impact)

## Business Value and Metrics

- Three categories of metrics are being reported
  - State of Data Quality
  - Business Value from Data Quality
  - Data Quality Program Performance
- For each category, a dashboard level status is summarized from detailed reports
- Drilldown information is included as appropriate for the specific metric



## Working Together and Communications



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## Applying Business Value Techniques

2 – Usage, 5 - Ranking and Prioritization, 7 - Cost of Low-Quality Data

- The SLM Data Quality Pilot team worked with the Data Governance (DG) Council to
  - Prioritize the top data elements to be monitored for the State of Data Quality metrics
    - A Word document captured the Council's first set of elements to be considered for monitoring
    - Some could not be monitored because the data was not available
    - Result was a list of 10 data elements/metrics to be monitored
  - Complete an initial survey to understand which Lines of Business (LOB) were impacted by data issues
    - Put a check mark to indicate which Lines of Business are impacted by the data issue represented by the metric
- The initial 10 metrics became 22 business rules (BRs) to be monitored for data quality and to assess business value (BV)

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## Initial Survey - Compiled Results

		LOB 1	LOB 2	LOB 3	LOB 4	LOB 5	LOB 6	LOB 7	LOB 8
	Respondent Name								
Metric Number	Metric Definition								
1		X			X	X		X	x
2					X	X		X	x
3					X	X		X	
4			X			X	X		X
5			X			X			X
6			X			X			X
7			X			X			X
8			X			X			X
9			X			X			X
10			X	X	X	X	X	X	X

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43

## Interviewing for Business Value – Prep and Logistics

- Used lists of typical categories of impacts due to poor quality data (see next 2 slides) to develop a list of “Typical Costs Due to Poor Quality Data” using Sallie Mae wording and descriptions
- Developed BV categories and definitions which were based on Sallie Mae’s operating budget chart of accounts
  - Revenue Generated (e.g. decreased write-offs; funding impact)
  - Costs Avoided (e.g. staff costs)
  - Intangible Benefits (other benefits that cannot be quantified)
- Mapped the Sallie Mae typical costs lists to the BV list
- Used the typical costs list to develop a questionnaire used in interview
  - Phone interviews held over several weeks with the DG Council and others from the LOBs impacted by the business rules to be monitored
  - Notes captured in word docs using the questionnaire template
  - Results for each Business Rule compiled from individual interviews
- Prepared participants so *they* came prepared to participate

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44

## Cost of Low Quality Data (1)

### Process Failure Costs

- Irrecoverable costs
- Liability and exposure costs
- Recovery costs of unhappy customers

### Information Scrap and Rework Costs

- Redundant data handling and support costs
- Costs of hunting or chasing missing information
- Business rework costs
- Workaround costs and decreased productivity
- Data verification costs
- Software rewrite costs
- Data cleansing and correction costs
- Data cleansing software costs



### Lost and Missed Opportunity Costs

- Lost opportunity costs
- Missed opportunity costs
- Lost shareholder value

Source: Larry P. English,  
“Improving Data Warehouse  
and Information Quality”

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45

## Cost of Low Quality Data (2)

### Hard Impacts – effects can be estimated and/or measured:

- Customer attrition
- Costs attributed to error detection
- Costs attributed to error rework
- Costs attributed to prevention of errors
- Costs associated with customer service
- Costs associated with fixing customer problems
- Time delays in operation
- Costs attributable to delays in processing



### Soft Impacts – clearly evident and have an effect on productivity, but are difficult to measure

- Difficulty in decision making
- Costs associated with enterprise-wide data inconsistency
- Organizational mistrust
- Lowered ability to effectively compete
- Data ownership conflicts
- Lowered employee satisfaction

Source: David Loshin, “Enterprise  
Knowledge Management: The Data  
Quality Approach”

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46

## Sample - Typical Costs Due to Poor Quality Data and BV Categories

Typical Costs Due to Poor Data Quality	Typical Costs Short Description	Mapping to BV Categories
Lost or Missed Opportunities in the LOB	Lost or missed opportunities within Marketing, Collections, etc.	<ul style="list-style-type: none"> <li>•Funding Impact</li> <li>•Decreased Write-offs</li> <li>•Increased Loan Volume</li> <li>•Intangible</li> </ul>
Workaround Costs and Decreased Productivity	Poor data quality causes manual workarounds to correct the data or deal with the incorrect data.	<ul style="list-style-type: none"> <li>•Staff Costs</li> <li>•Personnel and Development</li> <li>•Office Operations</li> <li>•Computer Operations</li> </ul>
Etc.		

BV Category for the Dashboard	BV Category Short Description
<b>Revenue Generated</b>	Non-operating expense income statement impacts as a result of improvements in data quality due to the data quality program
Funding Impact	Lower interest expense due to more favorable funding facility
Etc.	
<b>Costs Avoided</b>	Costs avoided (operating expenses) as a result of improvements in data quality due to the data quality program.
Staff Costs	Salaries, overtime, benefits
Etc.	
<b>Intangible Benefits</b>	Other benefits that cannot be quantified (avoiding organizational mistrust, lower employee morale, customer dissatisfaction, regulatory or compliance risk, lower ability to effectively compete. Impact to shareholder value)

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47

## Interviewing for Business Value (BV) – The Interviews

- Interviews – multiple interviews and follow-up emails to
  - Determine typical costs due to poor quality data using questionnaire
  - Determine BV intangibles
  - Discuss BV calculations
  - Rank impact to processes:
    - High - complete failure of the process or unacceptable financial, compliance, legal, or other risk is highly likely
    - Medium – Process will be hampered and significant economic consequences will result
    - Low – Minor economic consequences will result
  - Review initial DQ results, if available
  - Set status criteria ranges. What percentage DQ results will equal
    - Green – Results met target
    - Amber – Results failed target or unfavorable trend
    - Red – Unacceptable results
- Add BV information to dashboard and documentation
- We will be able to combine meetings for the next set of data to be monitored because of the experience from this first time



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48



## Dashboard - Reporting the Metrics

From concept ...



... to reality



Each section has the ability to drilldown and select information based on business rules or line of business

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SallieMae 49

- Foundational Concepts
- Ten Steps™ Process Used in the Case Study
- Case Study – Sallie Mae
- ➔ Summary and Next Steps

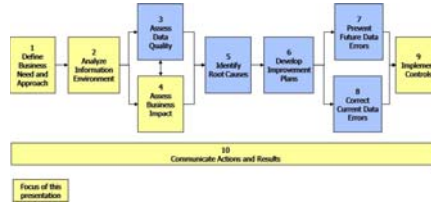
## SUMMARY

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50

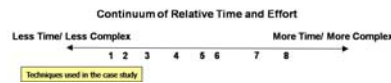
## What We Covered Today

### Ten Steps Used for Business Value



### Business Impact Techniques

Business Impact Techniques	
1. Anecdotes	5. Ranking and Prioritization
2. Usage	6. Process Impact
3. Five "Whys"	7. Cost of Low Quality Data
4. Benefit vs. Cost Matrix	8. Cost-Benefit Analysis and ROI



### Case Study - Ten Steps and Techniques Used to Assess and Report Business Value



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51

## Best Practice



What you learned today will apply to any:

#### Organization:

- For-profit businesses
- Government agencies
- Educational institutions
- Healthcare
- Non-profits and charities

#### Category of Data:

- Master data
- Transactional data
- Reference data
- Metadata

#### Data Subject Area:

- Customer
- Order Management
- Sales
- Marketing
- Finance
- Procurement
- Manufacturing
- Human Resources
- Etc.

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52

## Guidelines for Applying the Methodology

- **Relevant.** Ensure your work is associated with the business issue to be resolved
- **Pick-and-choose.** Select only those steps applicable to your project
- **Level of detail.** Start at a high level and go to more detail only if needed
- **Scale.** Use for one-person few week project to a several-month project with project team. Use in your individual work
- **Reuse (80/20 rule).** Bring together existing knowledge in such a way that you can understand it better. Supplement existing material with original research only as needed
- **Tool independent.** Make better use of the tools you have



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53

## Taking Action



- Apply what you have learned
  - Indicate the Ten Steps and business impact techniques most useful for your situation – and why
  - How can you include them in your program, projects or individual activities?
  
- What are *your* next steps?
  - This week
  - Next Monday
  - Next month

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54

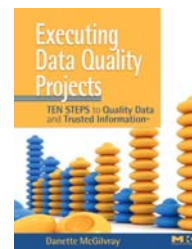
## Your Next Steps

Start where you are  
Use what you have  
Do what you can

--Arthur Ashe

## Additional Resources

- Contact Danette McGilvray ([danette@gfalls.com](mailto:danette@gfalls.com)) for consulting, presentations, training, and focused workshops to solve specific issues related to data quality and governance. See [www.gfalls.com](http://www.gfalls.com)
- *Executing Data Quality Projects: Ten Steps to Quality Data and Trusted Information™* by Danette McGilvray (Morgan Kaufman Publishers, Copyright 2008 Elsevier Inc.) Available at Amazon.com or your favorite bookseller. E-book also available at: <https://elsevierdirect.vitalsource.com/elsevierdirect>
- See <http://tensteps.gfalls.com> for:
  - Downloadable pdfs of the Framework for Information Quality, data quality dimensions, business impact techniques, The Ten Steps process and more
  - Templates described in the book
  - Additional web resources



Feel free to contact me if you have comments or  
questions: [danette@gfalls.com](mailto:danette@gfalls.com)

**THANK YOU!**

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57

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**SallieMae** 58

## Abstract

Awareness of any data quality issue immediately leads to questions such as "What impact does information quality have on the business?" and "Why does data quality matter?" Historically it has been difficult to answer these and demonstrate the value of information quality.

This presentation provides an overview of business impact techniques which are qualitative and quantitative methods for determining the effects of information quality on any organization. These approaches can be used in many situations – whether you are beginning an information quality program, implementing a data-quality focused project, including data quality in another project or methodology, or are an individual tasked with responsibilities in these areas. Techniques are applied based on need, time and resources available.

A case study shows how a variety of the techniques were used to develop and present the "Business Value from Data Quality" at Sallie Mae, a Fortune 500 company and the United State's leading provider of saving, planning, and paying for education programs.

## Your Presenter

Danette McGilvray is president and principal of Granite Falls Consulting, Inc., a firm that helps organizations increase their success by addressing the information quality and data governance aspects of their business efforts. Focusing on bottom-line results, Danette helps organizations enhance the value of their information assets by naturally integrating information quality management into the business. She also emphasizes communication and the human aspect of information quality and governance.

Danette is the author of *Executing Data Quality Projects: Ten Steps to Quality Data and Trusted Information™* (Morgan Kaufmann, 2008). Her Ten Steps™ approach to information quality has been embraced as a proven method for both understanding and creating information and data quality in the enterprise. Her book is used as a textbook in UALR's Information Quality graduate programs . The Chinese-language edition will be available June 2011

In 2009, she received the Professional Achievement Award from the Jon M. Huntsman School of Business at Utah State University in Logan, Utah. She has contributed articles to various industry journals and newsletters and has been profiled in PC Week and HP Measure Magazine. She was an invited delegate to the People's Republic of China to discuss roles and opportunities for women in the computer field. See more at [www.gfalls.com](http://www.gfalls.com).