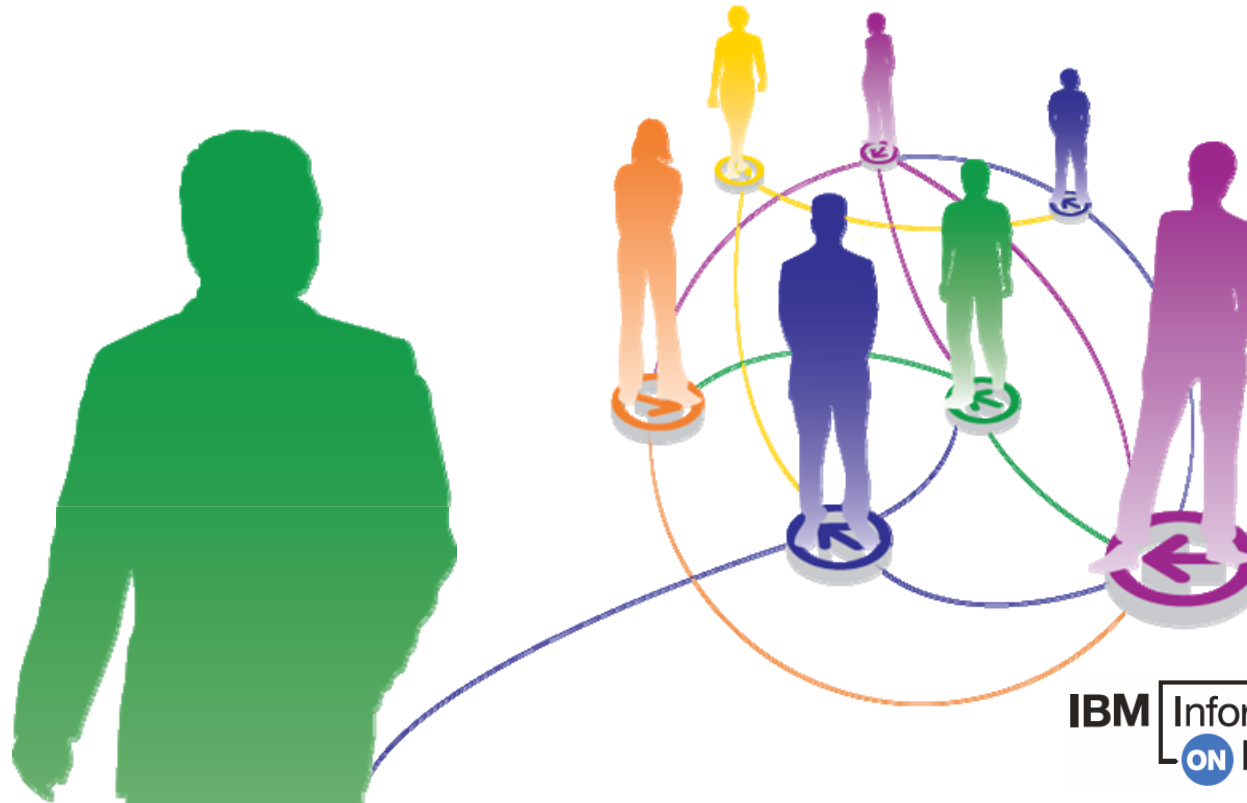


Data Governance

Richard Wozniak
IBM Data Governance Solutions



IBM Information
ON Demand 2010



INFORMATION-LED
TRANSFORMATION



LEAD
THE WAY



January 21 - SINGAPORE • January 26 – MALAYSIA • January 28 - THAILAND

Agenda

- IBM Data Governance POV
 - Making Data an Asset
 - Calculating Risk (Use Case: Global Credit Crisis)
 - Good Governance
- The Way Forward: Some Recommendations
 - Things we've done
 - Things we're working on
 - Cool Things anyway

Data, Information, Knowledge

- Data is unorganized information
 - The format of the data is somewhat relevant
- Information is organized Data
 - The structure of the organization is irrelevant
- Knowledge is interpreted Information
 - Until it becomes recorded in a computer
 - Then it is information
- Due to the variation of interpretation, decisions and outcomes will always be variable
 - People are not always rational
- This is why only systemic governance structures can produce more consistent outcomes

Data Governance

- Goals:
 - Make Data a Recognized Asset
 - Calculate Risks and Improve Compliance
- Enablers:
 - Councils and Stewards
 - Policy & Audit
 - Communication & Education
- Core Disciplines:
 - DQ, ILM, Security & Privacy, Risk Management, Records Management
- Supporting Disciplines:
 - DA, Metadata, Reporting

Business Perception of Data



No Value or Negative Value

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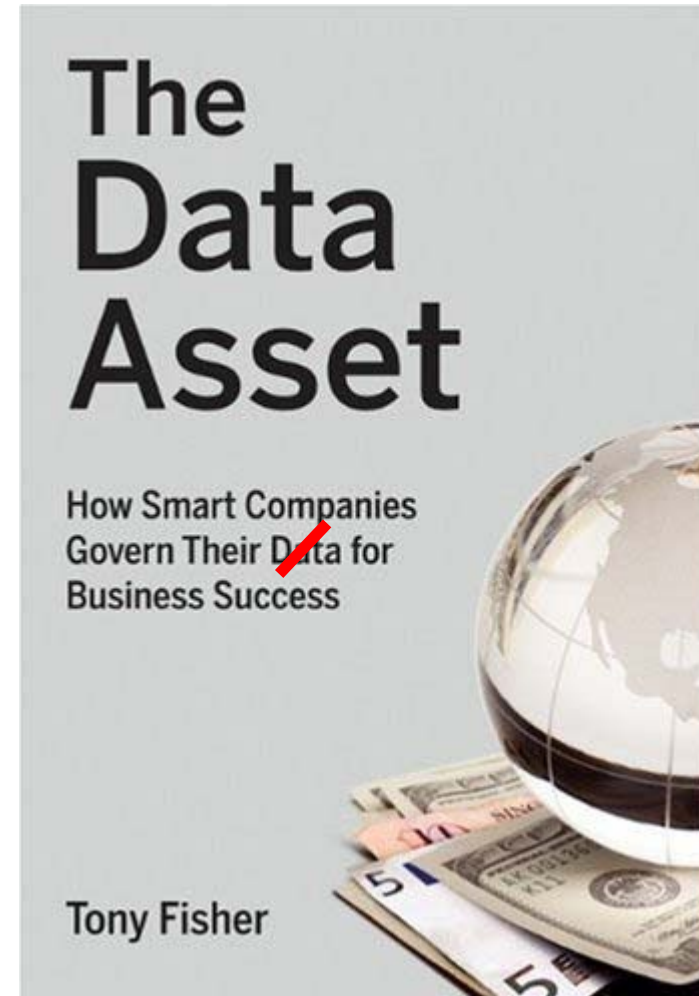


In the Perfect World...

- **IT would buy hardware, software, and services from other vendors at cost, mark them up, and resell those products to the business.**
- **The business would negotiate prices with IT and each division would pay new project, operational, and maintenance prices on all IT services.**
- **IT would only have an investment budget based on business needs.**
- **This would create an internal market for IT services similar to the real-world external market.**
- **The Value of IT would therefore be based on the utility of IT services.**
- **The value of data could also be measured using Utility Theory, because data management costs would be factored into IT prices.**

There is only one solution: Make Data an Asset

- An Asset produces Revenue or it is not an asset
- Getting Data Clean with MDM Hubs does not make it an asset
 - The competence argument
- You need to work directly with business to discover new ways to leverage customer, product, and financial data to generate revenue
- The day your information stops producing new revenue is the day the perceptual value of data declines
- **The Value of Data is Purely Perceptual**





The Competence Argument - 1988

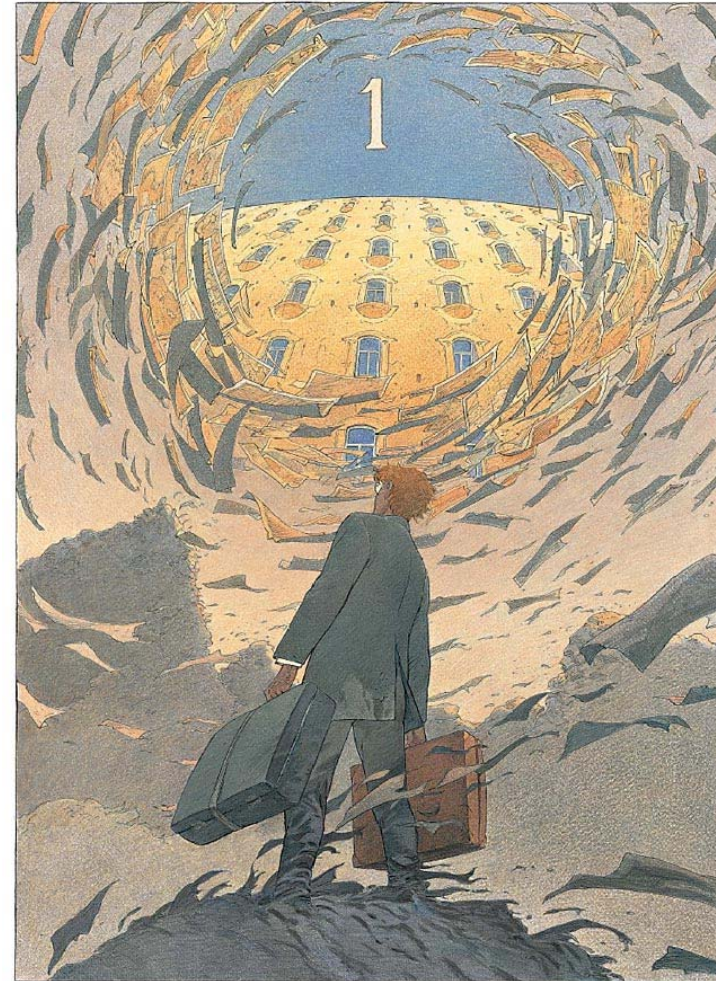
- Clean Data is not enough – it is a minimum business expectation of IT
- Meeting this goal is not Data Governance – Data is inert and can't be governed
- You need to do more than this to win!



What we Want: The information intensive organization

→ They are:

- Create value by transforming information
- Integrated along several value chains
- Transparent and accountable
- Agile and Risk tolerant
- High performance
- Operate across any perturbation
- Able to influence the future
 - Of the organization
 - The community
 - The marketplaces



And now let's look at the Credit Crisis

Global Crisis News

[HOME](#)[ABOUT](#)[CONTACT](#)[Asia](#)[Business](#)[Europe](#)[General](#)[Politics](#)[Real Estate](#)[Russia](#)

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IMF: Economic crisis to cost \$4 trillion

April 22, 2009 by [GlobalCrisisNews.com](#)



The IMF has calculated that global losses from the financial crisis could rise to \$4 trillion. While some are already talking about recovery and others promoting “glimmers of hope”, the IMF

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Some Key Causes of Credit Crisis

- **Low interest rates from 2002 to 2005**
 - -"Go Shopping" - George W. Bush
- **Government Policies that promoted mortgage market risk taking***
 - Political pressure on Fannie Mae and Freddie Mac
 - Lending subsidies via FHLB that promoted high leverage
- **2006 changes in loan origination underwriting guidelines that allowed income declarations instead of income documentation.**
 - Dramatic drop in loan quality and huge rise in fraud
- **2006 legislation that encouraged rating agencies to relax standards for measuring risk in subprime securitization.***
- **Government regulations limiting who can buy stock in banks***
- **Prudential Regulation (Basel II) of banks has proven inadequate***
- **Asymmetrical Mortgage Market that freezes homeowners in down markets**

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*Source: *Financial Innovation, regulation, and reform*, Charles Calomiris

GSE's and Toxic Content

- The GSE's had historic data quality challenges
- They restated earnings by \$billions in 2003,4, and 5 because of poor data quality in the securitization process
- But they made huge fees in MBS securitization and the documentation mods increased securitization volume – and thus fees -in 2005, 6, and 7.
- Through no-doc and low-doc loans, vast amounts of opaque risk entered the mortgage supply chain.
- This Toxic Content was especially rife in speculative markets such as Stockton, Phoenix, Las Vegas, and Miami
- Securitization passed this Toxic Content into the global financial system

Six Data Governance Questions

- 1. Do we have a Government?**
 1. Who is responsible for governing?
 2. How do we share accountability across the enterprise?
- 2. How do we assess our situation?**
 1. What Data do we monitor?
 2. How do we measure the quality of our Decisions?
- 3. What is our Strategy?**
 1. How do we share information?
 2. What organizational obstacles stand in our way?
- 4. What is our data worth?**
 1. How much revenue is it producing?
 2. How much does low quality data cost?
- 5. What are our vulnerabilities?**
 1. How do we calculate risk?
 2. Which risks do we accept, mitigate, transfer?
- 6. How do we measure progress?**
 1. What do audits tell us?
 2. How do we report results that matter?



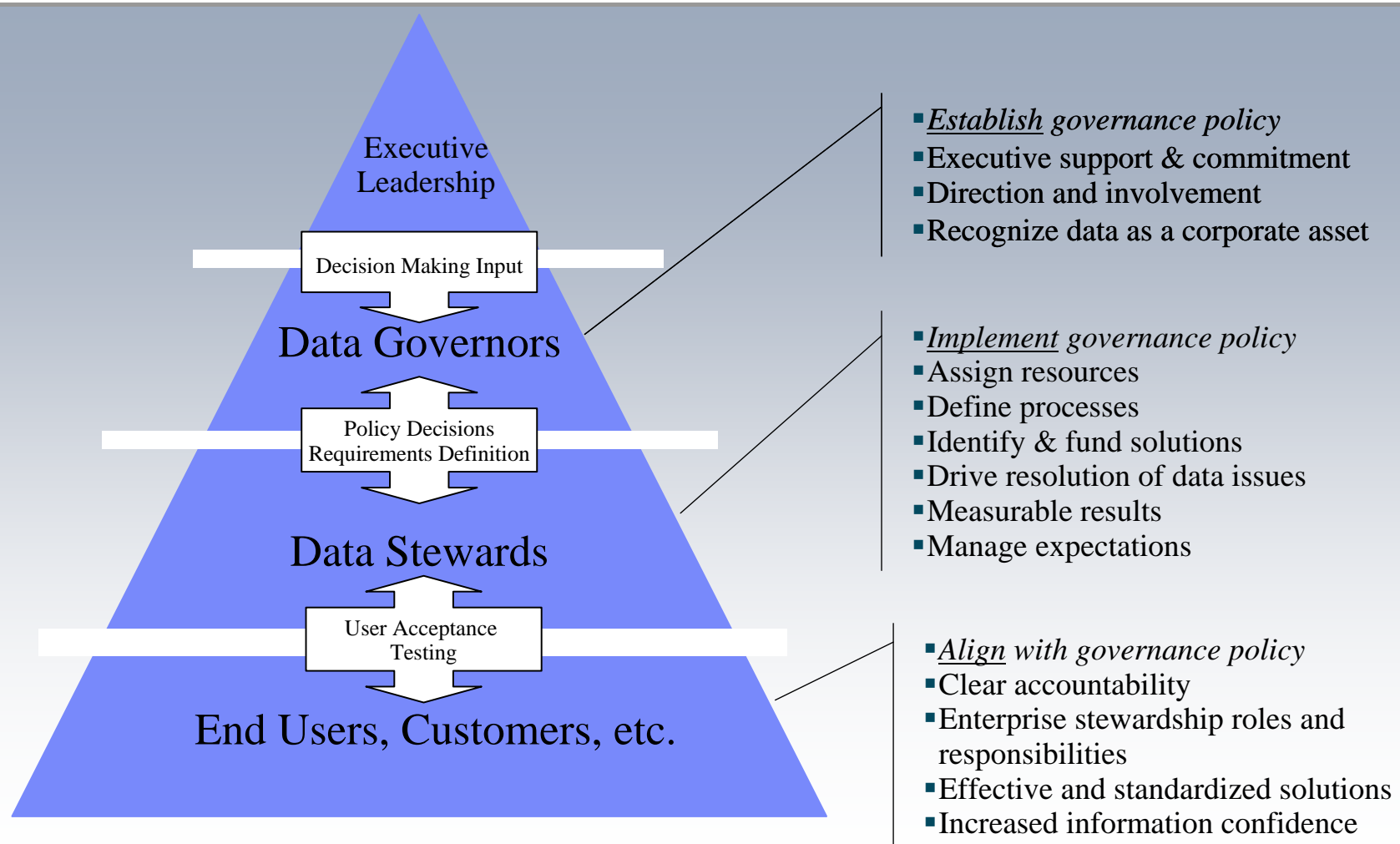
1. Do we have a Government?

- Who are the leaders?
- What does the DG Committee look like?
- What power centers should be at the table?
- How many business representatives are in the Council?
- What is the charter of the group?
- How are issues raised, discussed, and resolved?
- How are requirements gathered?
- How are policies communicated?
- What are our legislative powers?
- How do we govern?

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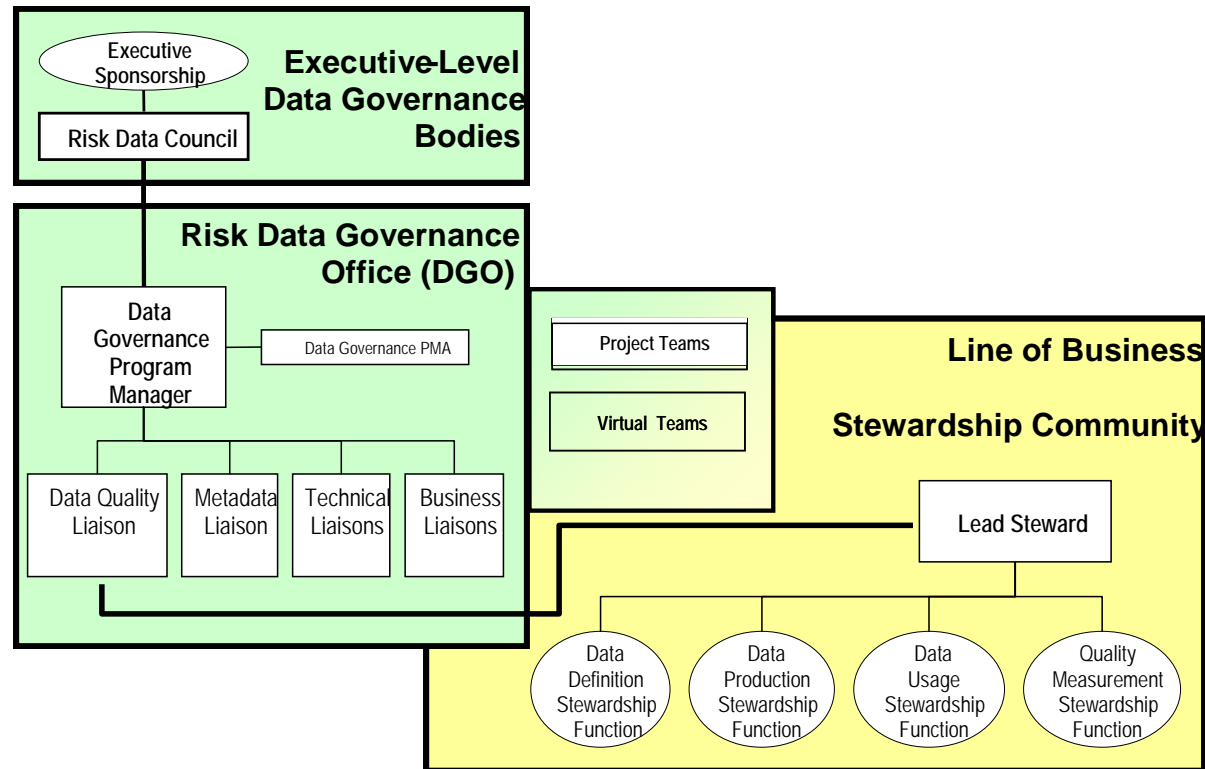


One Data Governance Structural Options



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Data Governance Operating Model

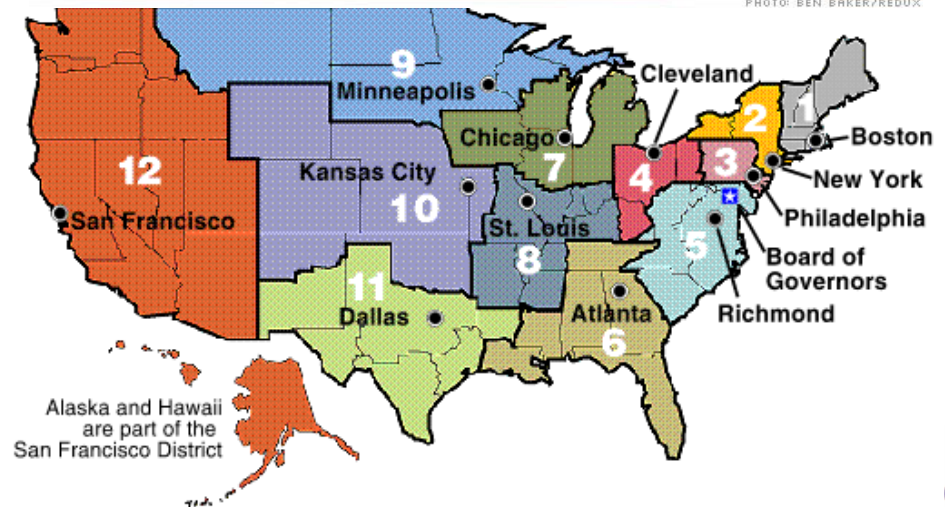


- **Risk Data Council: Decisioning body.**
- **Risk Data Governance Office: Operating entity**
- **Stewardship Community: Distributed data accountability**

Use Case: Fed Board of Governors



PHOTO: BEN BAKER/REDOX



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2. How do we assess our situation?

- Few organizations consciously record:
 - Data
 - Information
 - Interpretations
 - Decisions
 - Outcomes
- In a decision supply chain...
- And without a governance process to do this systemically, progress is inconsistent at best...

Systemic Risk

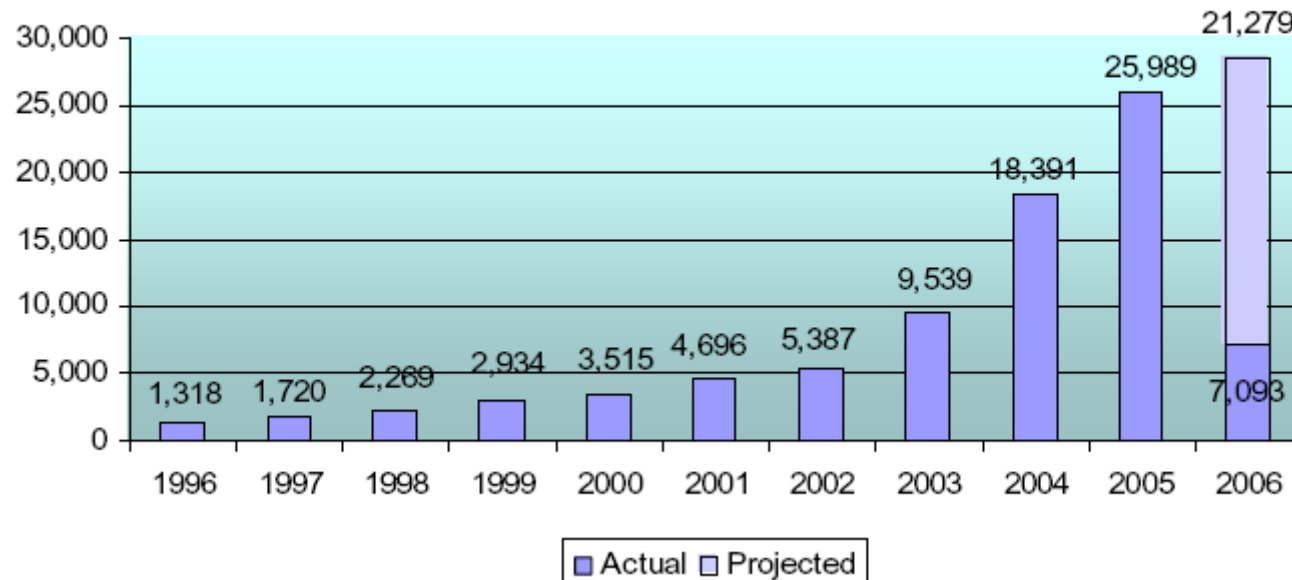
- The Fed monitors many key risk indicators
 - Bond Yields
 - CDS Spreads
 - Market Volatility
 - FHA Data
 - Regional Economic Trends
- Interpreting this information is the job of hundreds of economists on staff
- Each governor brings their interpretations and knowledge to the meetings
- If the data is not trusted, the results can be toxic!

Table 1: Loan Characteristics at Origination for Different Vintages

Descriptive statistics for the first-lien subprime loans in the LoanPerformance database. We do not report other mortgage types, which amount to less than 0.1%.

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|-------------------------|------|------|------|------|------|------|
| <i>Size</i> | | | | | | |
| Number of Loans (*1000) | 624 | 974 | 1676 | 2743 | 3440 | 2646 |

MORTGAGE LOAN FRAUD REPORTING TREND



| | | | | | | |
|--|------|------|------|------|------|------|
| Investor Dummy (%) | 10.0 | 12.0 | 14.0 | 14.0 | 15.0 | 15.0 |
| Documentation Dummy (%) | 68.5 | 63.4 | 59.8 | 57.2 | 51.8 | 44.7 |
| Prepayment Penalty Dummy (%) | 66.5 | 63.8 | 61.4 | 60.1 | 60.6 | 61.6 |
| Mortgage Rate (%) | 9.4 | 8.3 | 7.3 | 6.7 | 6.6 | 7.2 |
| Margin for ARM and Hybrid Mortgage Loans (%) | 6.2 | 6.3 | 5.9 | 5.3 | 5.0 | 4.9 |



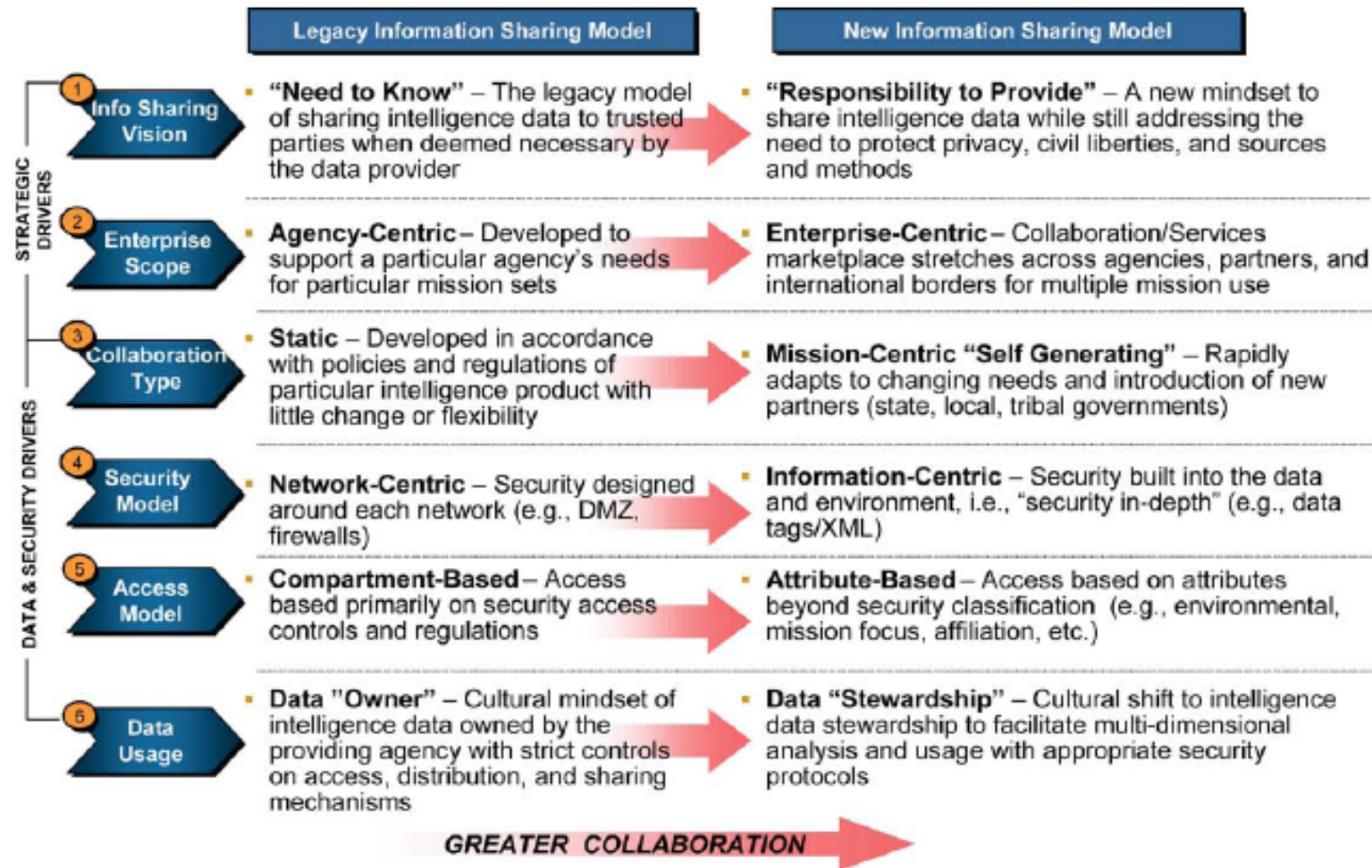
3. What is our Strategy?

- How do we share information?
- What is our metadata strategy?
- What is our culture and what organizational obstacles might we face?
- What is our decision-making process?
- How will we make and evaluate policy?
- How will fund and implement programs?

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After 9/11 the Government established information sharing architectures for security...



You can use the same Standard Data Governance Architecture in your firm

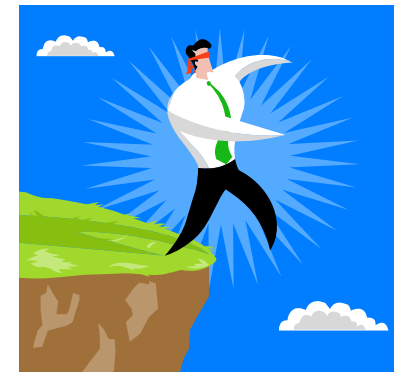
| | Description | Key Questions |
|--|--|---|
| Governance The "environment" influencing sharing | Oversight and leadership that help govern information sharing. How managers drive initiatives within organization and across agencies. Standards and guidelines to ensure a consistent approach. | <ul style="list-style-type: none"> Is there a clear value proposition for sharing among partners, i.e., quid pro quo or negotiated trade-offs? Are MOUs or service-level agreements required? Do people understand how to abide by the law and policies? How are information sharing disputes resolved? Who are the key stakeholders? |
| Policy The "rules" for sharing | National policies, internal policies, rules of engagement, standards, and role of players internal and external to the organization. | <ul style="list-style-type: none"> Are laws, regulations, policies, and procedures in place that authorize, mandate and/or enable the organization to share? Is the organization complying with these mandates? Do laws/regulations/policies/procedures impede or constrain the organization/people from sharing? Are privacy and civil liberties sufficiently protected? |
| Technology The "capability" to enable sharing | The technology, systems, and protocols that provide the platform for enabling the sharing of information and that address security and privacy issues. | <ul style="list-style-type: none"> Are there common data standards and systems for organizing, identifying, and searching? Can participants push and pull data across networks? How is information protected; is the system auditable? Are tools/mechanisms available to manage identities; authorize, authenticate, and audit users; and ensure confidentiality? |
| Culture The "will" to share | The organizational approach and philosophy around sharing information and its ability to realign and adapt as circumstances change. | <ul style="list-style-type: none"> How do we motivate people and create incentives to collaborate and share information across organizations? Does the organization communicate across all levels? How does the organization adapt to change, and how responsive is it to stresses and opportunities? How are decisions and conclusions reached? |
| Economics The "value" of sharing | Ability to obtain and provide resources for information sharing initiatives, and external pressures (e.g., budget) that influence how resources are allocated and managed. | <ul style="list-style-type: none"> Has sufficient funding been appropriated to support the initiative? Have incentive structures been developed? Is the funding reaching the appropriate level within the enterprise to fully implement the sharing program? How do we measure performance? |

Joii

Source: US Intelligence Community Information Sharing Strategy, 2008

5. What are our Risks?

- **Security Risks**
- **Regulatory Concerns**
 - . Different approaches in laws
 - . Related documentation and administration
 - . Bringing regulations and reality together
- **Reputation Risks**
 - . Data leakage
 - Protected data
 - “sensitive data”
 - . Misuse of data
 - . Loss of Data
 - . Risk of “bad” data





Business Problems

- Most companies can't measure risks and forecast losses
- Most organizations don't have x-functional risk organizations and loss repositories that disseminate loss information to every stakeholder
- No organization is able to:
 - Calculate exposure probabilities for operational and business decisions
 - Provide risk choices and model potential policy outcomes
 - Record decisions and compare them to results to improve business performance over time
- No regulatory authority has any visibility into any of these processes and that hurts our markets and economies

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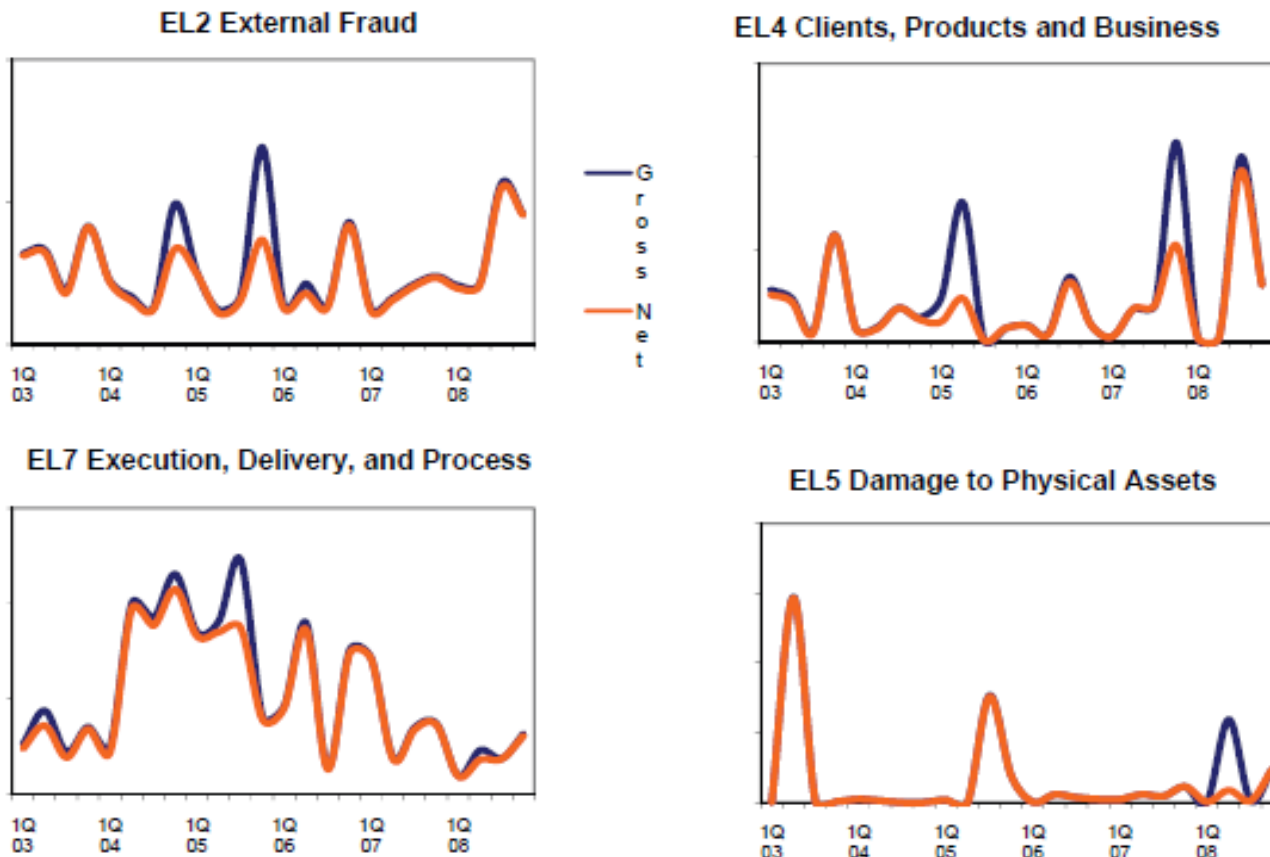


Some of the Right Questions...

- Could this type of event happen to me?
- If not, why not? Why are my controls better?
- If yes, how? What could the impact be?
- What can I learn from this event? Are there lessons that can help my business become more effective?
- Can we see any patterns and trends across different events that indicate a 'growing concern'?
- Were there any warning signs? Indicators? How can I bring these measures into my business?
- How did management respond to the event? How would our management respond if this event happened to us?

Historical Loss Trends

Benchmarking Reports: Loss Trends need to be integrated into DG Decision Making to learn from past mistakes and avoid future ones.



6. How to Measure Progress

- You have to look across the entire data supply chain
- Recognize the inter-dependence and inter-connectedness of information
- Leverage Governance Councils for x-organizational decision making
- Leverage Business Glossaries to define semantic standards
- Make use of common Metadata repositories to translate information into Knowledge with common meanings
- Audit, Audit, Audit all the time

Data Governance Council was formed in 2004 to define market requirements and enable members to succeed with DG

Data Governance Council Members

| Customers | Business Partners | Academia | |
|--------------------------|------------------------|----------------------|---------------------|
| Abbott | IBM CIO Office | Application Security | Nova Southeastern |
| American Express | Kasikornbank | Axentis | Bucerius Law School |
| Bank of America | Key Bank | Continuity Software | |
| Bank of Montreal | MasterCard | Guardium | |
| Bank of Tokyo/Mitsubishi | Merrill Lynch | Intellinx | |
| Bell Canada | Novartis | Involv | |
| BITS | Nordea Bank | OpenPages | |
| Cadence Design | PFG | Paisley | |
| Citigroup | TIAA-CREF | Perficient | |
| Danske Bank | TeliaSonera | RiskWatch | |
| Deutsche Bank | VP Securities Services | SecNap | |
| Discover Financial | Washington Mutual | Tizor | |
| Equifax | Wachovia | Veronis | |
| Fannie Mae | The World Bank | | |

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Data Governance - becoming a Regulatory Requirement

2008 Predictions :

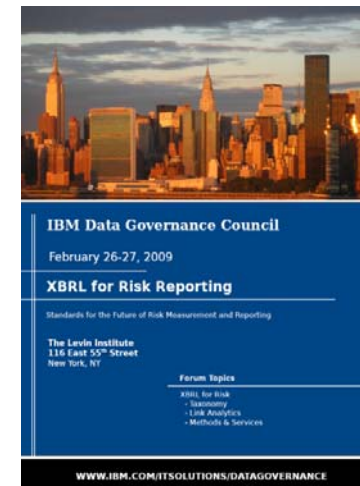
- ✓ Value of data will be treated as an asset on the balance sheet
- ✓ Data quality will become a key IT performance indicator
- ✓ Calculating risk will be used more pervasively across enterprises for small and large decision making
- ✓ Employees will be required to take more responsibility for recognizing problems & participating in the governance process
- ✓ Chief Information Officers will become responsible for reporting on data quality & risk

IBM Data Governance Council

Formed in 2004 with 50 Global Companies Including:

Abbott Labs, American Express, Bank of America, Bank of Tokyo-Mitsubishi UFJ, Ltd, Bank of Montreal, Bell Canada, BMO Financial Group, Citibank, Deutsche Bank, Discover Financial, Kasikornbank, MasterCard, Nordea Bank, Wachovia, Washington Mutual, the World Bank and others...

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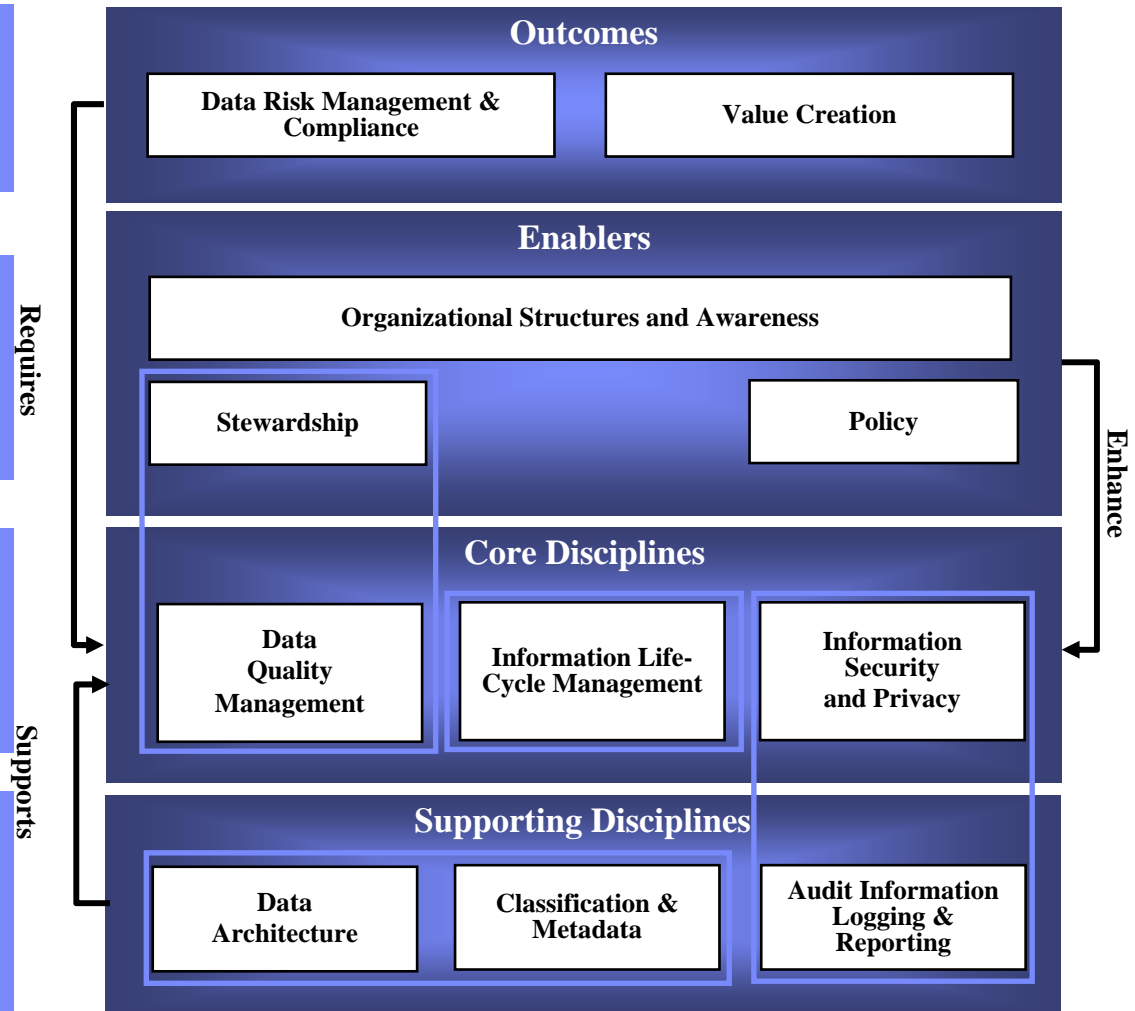
IBM Data Governance – A model for success

- Lower Risk and Cost
- Increased profitability
- Competitive differential

- IT / Business data responsibilities
- Custodial care of data
- Organizational behaviour

- Quality and integrity of **all** data
- Information collection, use, retention, and deletion
- Mitigate risk and protect data assets.

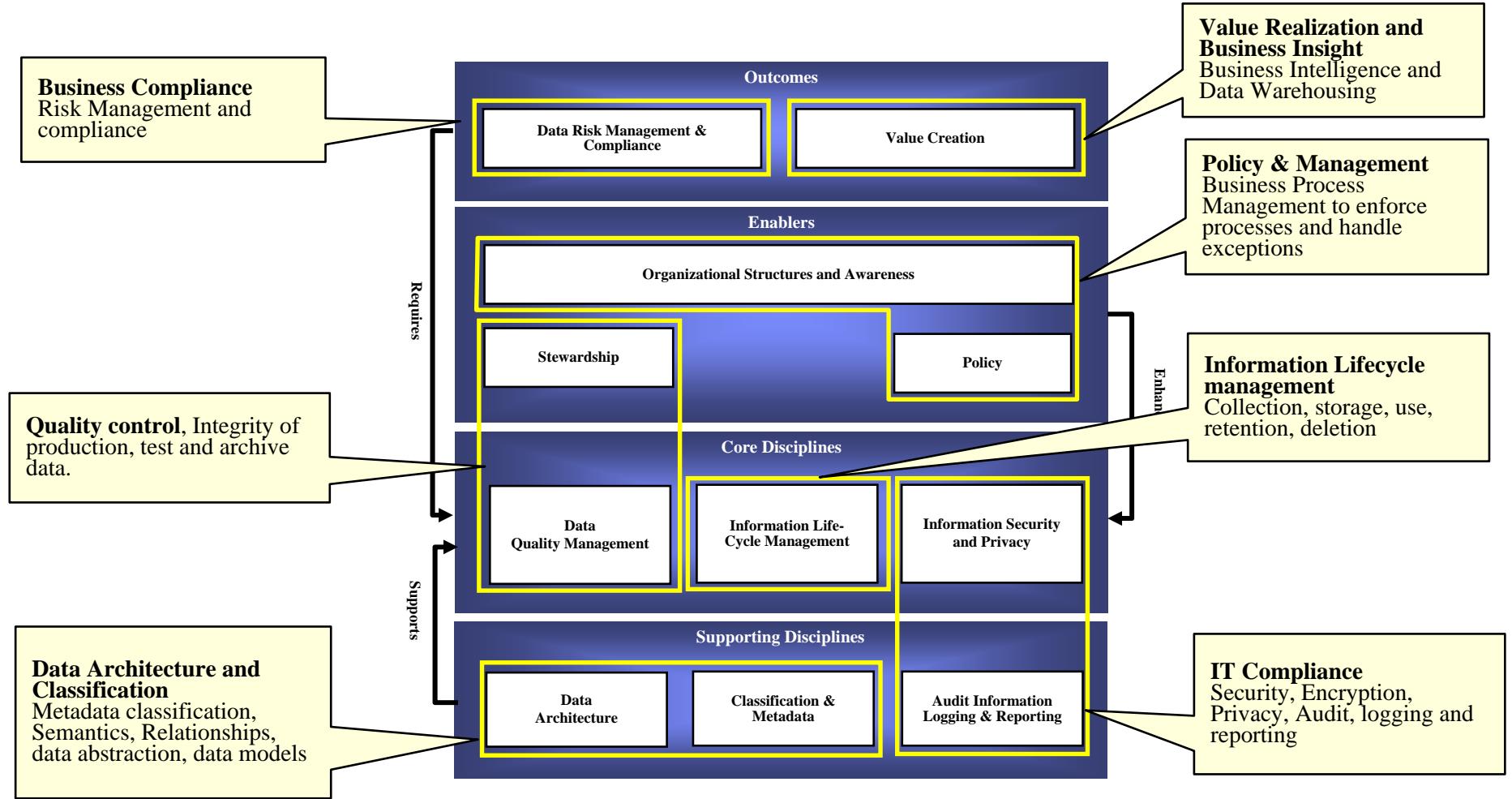
- Architected design for availability and distribution of data
- Common semantics
- Monitor / measure data value, risk



The IBM Data Governance Council's Capabilities Model

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IBM has the Expertise and Products to deliver on All aspects of Data Governance



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The Maturity Model Workshop benchmarks current practices against those of industry peers

The screenshot displays the 'Assessment & Roadmap Tool v4.5.36.0' interface. The main window shows a maturity model assessment for 'Data Governance' under the 'Data Risk Management (DRM) and Compliance' subdomain. The assessment is currently at level 2 on a scale of 0 to 5. The interface includes a progress bar, a table of maturity levels with descriptions, and various control elements like dropdown menus for priority and cost/complexity.

| Initial | Repeatable | Defined | Managed | Optimizing |
|---|---|--|--|--|
| <p>The Data Governance (DG) process is ad hoc, and occasionally even chaotic. Few processes are defined, and success is tied to individual effort.</p> <p>The Confidence Index in terms of Data Risk Mgmt effectiveness of any effort is LOW.</p> | <p>There are basic processes to identify data risks and track quality. Successes on earlier projects with like applications are being repeated.</p> <p>The Confidence Index in terms of Risk Mgmt effectiveness of any effort is LOW to MEDIUM.</p> | <p>The process for DG and stewardship is documented and integrated. All projects use an approved version of the organization's standard DG process.</p> <p>Confidence Index in terms of Risk Mgmt effectiveness of any effort is MEDIUM.</p> | <p>Detailed measures of the DG process are collected. Both the governance process and risk mgmt are quantitatively understood and controlled.</p> <p>Confidence Index in terms of Risk Management effectiveness of any effort is MEDIUM to HIGH.</p> | <p>On-going improvement is enabled by quantitative feedback from the process and from piloting innovative ideas and technologies.</p> <p>Confidence Index in terms of risk management effectiveness of any effort is HIGH.</p> |

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IBM Data Governance Maturity Model Workshop

Project Scope

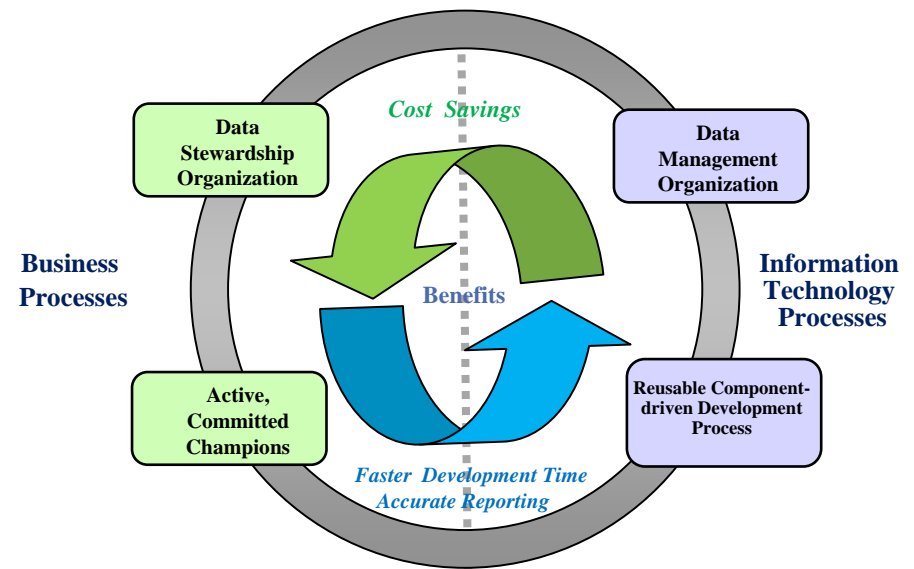
Project scope of the Data Governance Workshop will focus on key data governance areas and business value identification

11 Dimensions Assessed

- Audit and Reporting
- Data Architecture
- Data Quality
- Information Lifecycle Management
- Meta Data / Business Glossary
- Organizational Development
- Policy
- Risk Management
- Security / Privacy / Compliance
- Stewardship
- Value Creation

Maturity Model Scope

Data Governance



Value Creation defines how an organization realizes returns on investment that Data Governance provides in the collection, management and usage of information

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IBM Data Governance Maturity Model Workshop

Identify Areas of Greatest Benefit

Assessment Objectives

- ✓ Provide an informed, objective, documented assessment of “current state” data governance maturity
- ✓ Outline “future state” and roadmap for near-term data governance objectives
- ✓ Identify key business value areas and map ROI potential to “future state” objectives

Benefit

Assessment is designed to help:

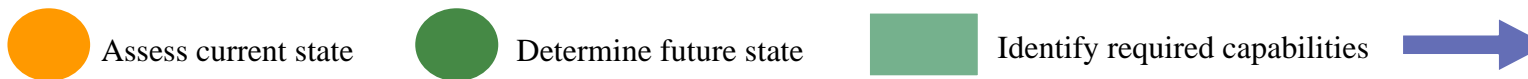
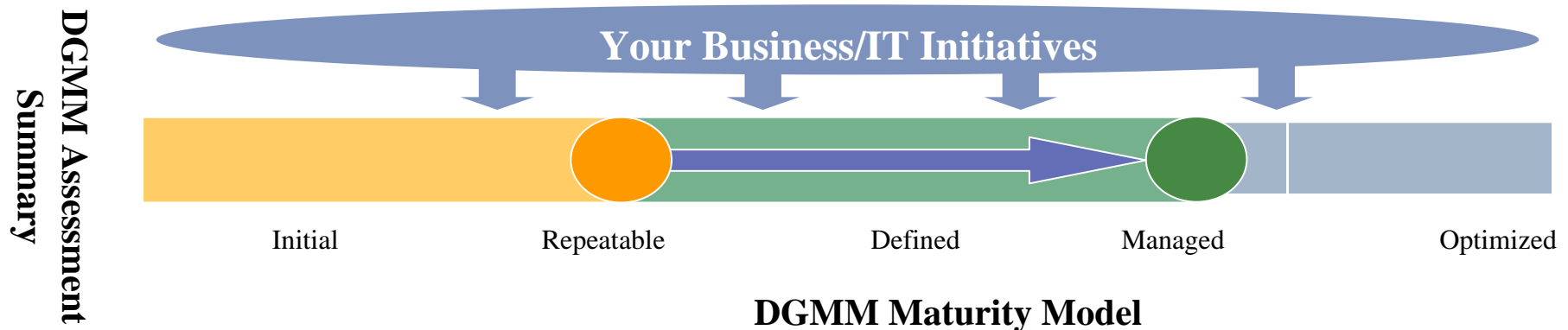
1. Define strengths and weakness in existing data governance organization, technologies, processes and activities
2. Build common understanding as to the various areas or disciplines supporting a high level of maturity regarding data governance
3. Build consensus across the enterprise regarding current and target level of maturity across the dimensions of data governance
4. Develop a roadmap to bridge the gap between current and target maturity state
5. Build a foundation for addressing these considerations to enhance level of data governance maturity

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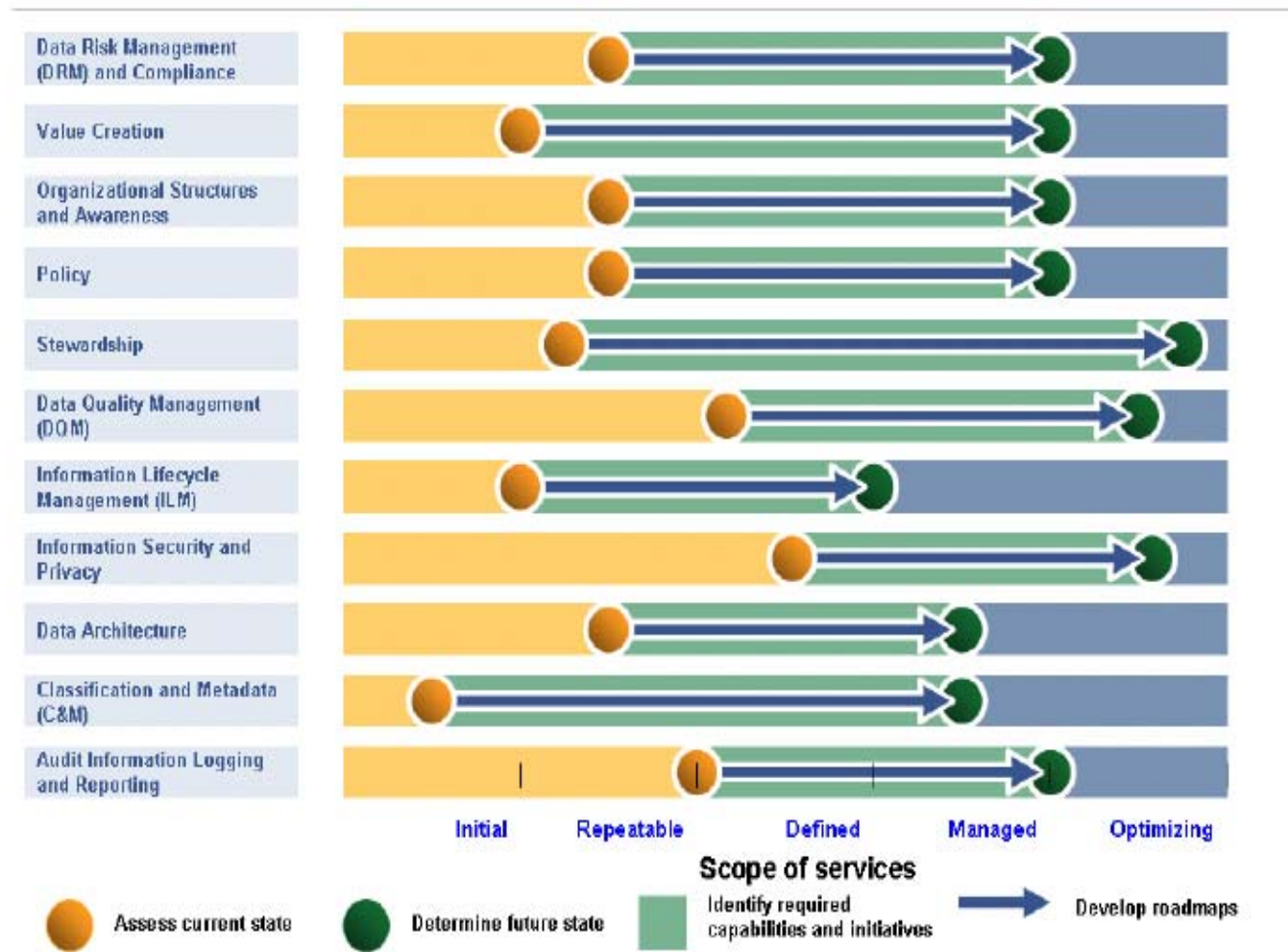
Deliverables from the DGMM Workshop

- Assessment of Current State
- Determined Future State
- Identify Required Capabilities (The Gap)
- Developed Roadmap (To Close the Gap)



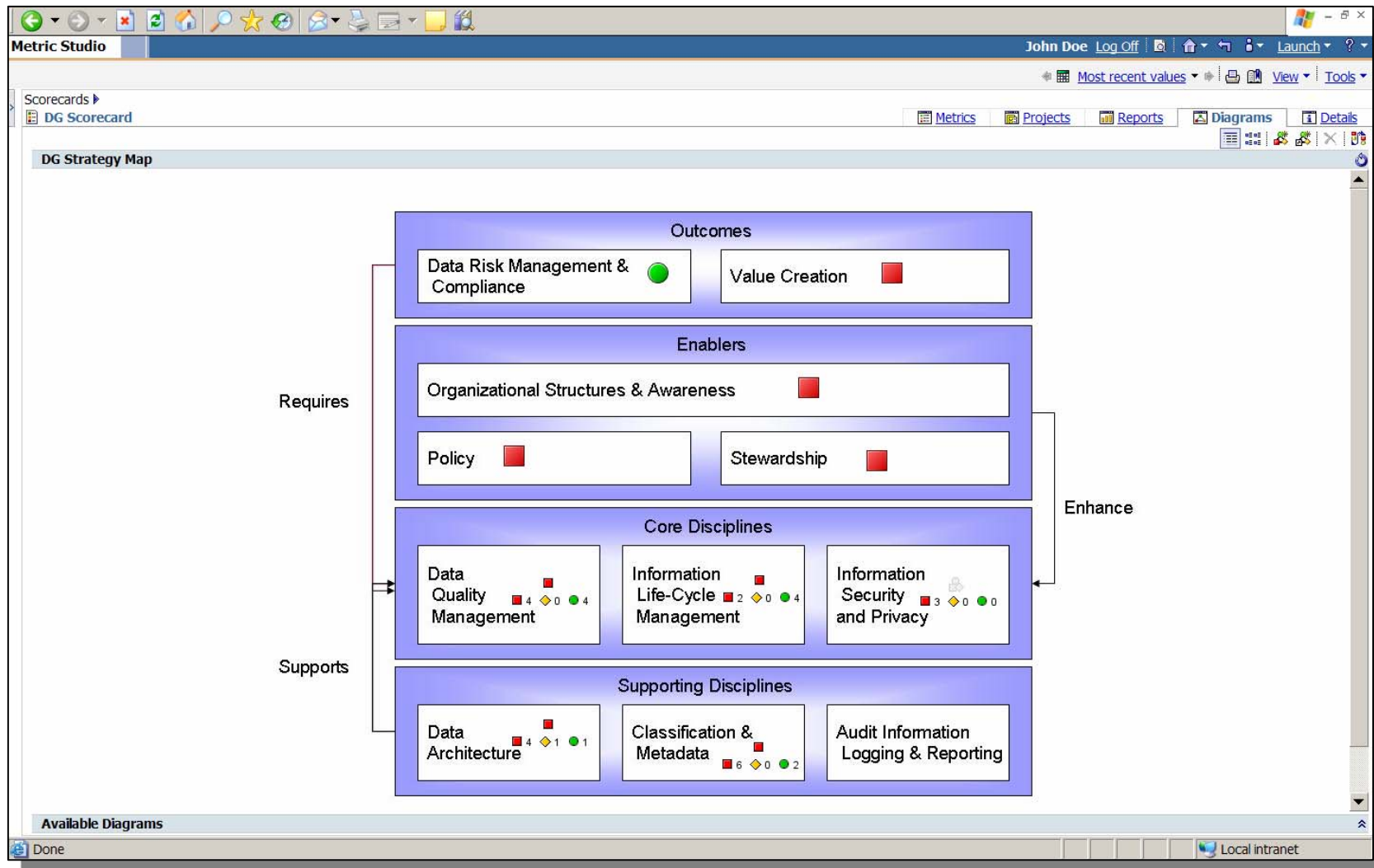
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It is a Tool that enables diverse customer groups to identify common organizational pains and build roadmaps to overcome them



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IBM Cognos 8 BI Scorecarding: Strategy Map reflects the DG maturity model IP and represents status of key metrics.



Drilling down on a DG element, we can view underlying metrics and their status. Summation method, data source and metric relationships can be easily modeled.

Value Creation

| Name | Actual | Target | Variance | Variance % | Time Period |
|--|------------|-----------|------------|------------|-------------|
| Value of DG report issues | US\$76.81 | US\$98.00 | -US\$21.19 | 21.62% | Oct 2008 |
| Value of DG issues remediated | US\$102.74 | US\$98.00 | US\$4.74 | 4.84% | Oct 2008 |
| Value of DG issues outstanding | US\$90.69 | US\$98.00 | -US\$7.31 | 7.46% | Oct 2008 |
| Capital Impact of Outstanding DG Issues (Est.) | US\$88.51 | US\$98.00 | -US\$9.49 | 9.69% | Oct 2008 |
| Cost of DG program | US\$109.45 | US\$98.00 | US\$11.45 | 11.69% | Oct 2008 |
| Benefit of DG program | US\$89.57 | US\$98.00 | -US\$8.43 | 8.60% | Oct 2008 |
| DG projects funded | 102.72 | 98.00 | 4.72 | 4.82% | Oct 2008 |
| DG projects in progress | 92.52 | 98.00 | -5.48 | 5.59% | Oct 2008 |
| DG projects completed | 97.51 | 98.00 | -0.49 | 0.50% | Oct 2008 |

Risk Management

| Name | Actual | Target | Variance | Variance % | Time Period |
|---|-----------|-----------|------------|------------|-------------|
| No. of Reported ERM Issues | 346.09 | 450.00 | -103.91 | 23.09% | Oct 2008 |
| Remediated ERM issues | 97.44% | 5,000.00% | -4,902.56% | 98.05% | Oct 2008 |
| Outstanding ERM issues | 80.82 | 95.00 | -14.18 | 14.92% | Oct 2008 |
| No. of defered ERM issues | 90.06 | 92.00 | -1.94 | 2.11% | Oct 2008 |
| No. of ERM remediation projects | 58.62 | 50.00 | 8.62 | 17.24% | Oct 2008 |
| Value of Remediated ERM issues | US\$83.23 | US\$75.00 | US\$8.23 | 10.98% | Oct 2008 |
| Value of Outstanding ERM Issues | US\$79.29 | US\$98.00 | -US\$18.71 | 19.09% | Oct 2008 |
| Capital Impact of Outstanding ERM Issues (Est.) | US\$78.95 | US\$98.00 | -US\$19.05 | 19.44% | Oct 2008 |
| Hours spent on ERM Remediation | 93.36 | 90.00 | 3.36 | 3.73% | Oct 2008 |
| Cost of ERM Remediation | US\$76.54 | US\$80.00 | -US\$3.46 | 4.33% | Oct 2008 |

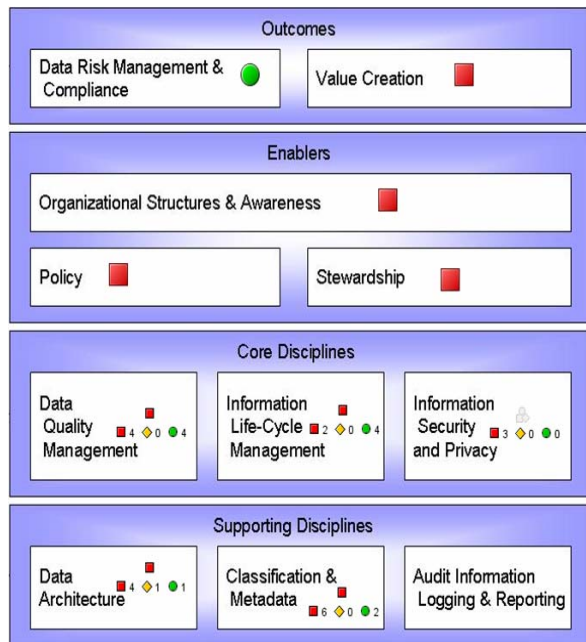
Organization & Awareness

| Name | Actual | Target | Variance | Variance % | Time Period |
|------------------------------|--------|--------|----------|------------|-------------|
| No. of DG Office Staff | 43.77 | 50.00 | -6.23 | 12.46% | Oct 2008 |
| DG Staff Turnover Ratio | 9.33 | 6.00 | 3.33 | 55.56% | Oct 2008 |
| Number of DG Issues Activity | 91.15 | 50.00 | 41.15 | 82.30% | Oct 2008 |

IBM DG Scorecard Report Card – integrated into your BI solutions (IBM Cognos Metric Studio)

- DGMM Strategy Map
- Measurement Identification
- Implementation Road map

Data Governance Scorecard



DG Scorecard

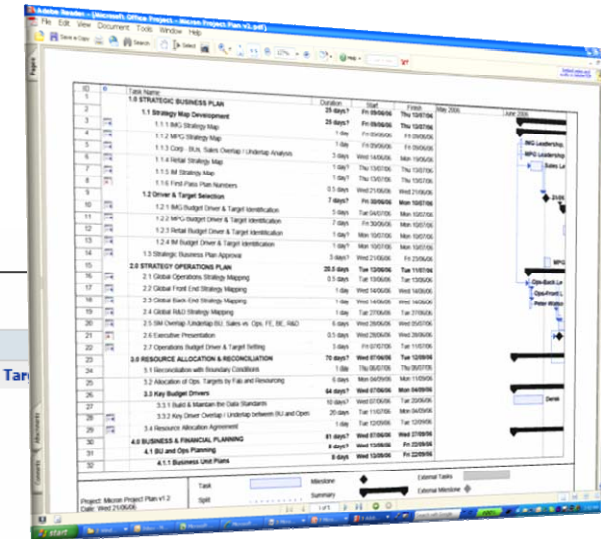
No filter Strategic Theme

Architecture

| | Name | Actual | Target | Variance |
|--------------------------------------|---------------------------------------|-----------|------------|----------|
| ■ | DG Architecture Issues | 110.23 | | |
| ■ | No. of Data Reconciliation Points | 105.62 | | |
| ● | Data Warehouse Availability Status | 115.41 | | |
| ■ | No. of Data Architecture Projects | 111.07 | | |
| ■ | Hours spent on Data Architecture Work | 111.62 | 101.60 | |
| ● | Cost of Data Architecture Work | US\$91.37 | US\$100.78 | -US\$ |

Audit & Reporting

| | Name | Actual | Target | Variance |
|--------------------------------------|--------------------------------|-----------|-----------|----------|
| ■ | No. of Audits | 82.94 | 99.09 | - |
| ■ | No. of Deficiencies | 102.63 | 98.06 | |
| ■ | No. of Deficiencies Remediated | 82.90 | 104.76 | - |
| ■ | Audit Hours | 105.48 | 96.87 | |
| ● | Cost of Audit Activity | US\$80.58 | US\$99.40 | -US\$ |



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Sources of Information from this presentation

- NASCIO Articles: <http://www.nascio.org/publications/>
- My Blog: <http://www.ibm.com/developerworks/blogs/page/adler>
- Principle of Balance Mortgages:
https://www.ibm.com/developerworks/blogs/resources/adler/20090325_3.pdf
- Understanding Subprime:
http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1020396
- IBM Data Governance Solutions: <http://www-01.ibm.com/software/tivoli/governance/servicemanagement/data-governance.html>
- Steven Adler: adler1@us.ibm.com