



NATIONAL INSTITUTES OF HEALTH
enterpriseARCHITECTURE

Information Governance Evaluation

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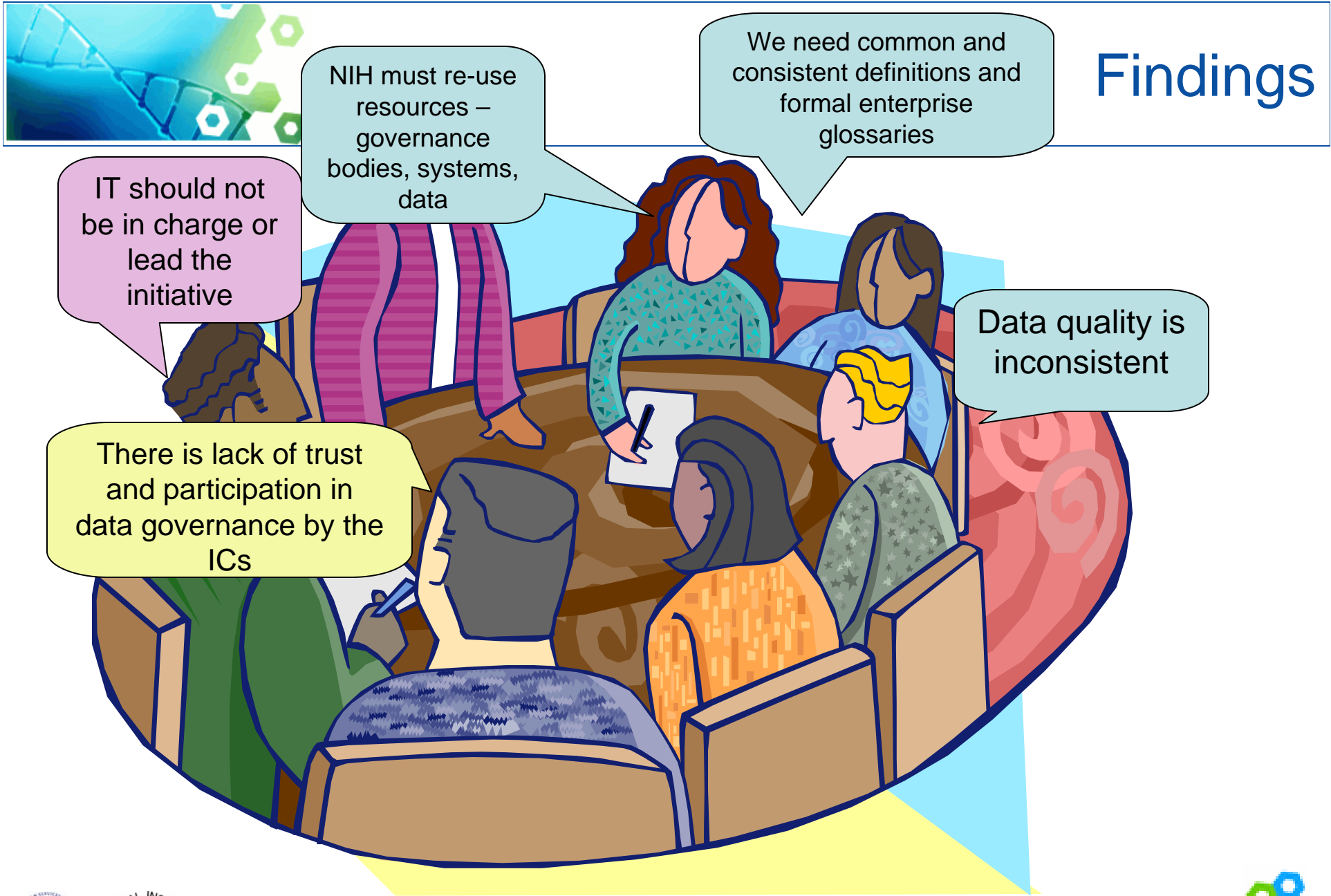


Background

- Originally we met with the Small Staff on March 7, 2008 to propose a scope and approach of Information Governance
- At the conclusion of the meeting we were asked to:
 - Talk to business stakeholders to get their views and document their needs
 - Secure Evaluation Funds to explore NIH Information Governance in more detail
- Today's brief has four purposes
 - Present our findings of our talk with the business
 - Provide you with a report on our progress
 - Introduce to you our proposed approach for going forward
 - Solicit input on the above and acceptance of the approach



Findings



NIH must re-use resources – governance bodies, systems, data

We need common and consistent definitions and formal enterprise glossaries

IT should not be in charge or lead the initiative

Data quality is inconsistent

There is lack of trust and participation in data governance by the ICs





Our Reflections

IT Won't Lead Information Governance

- Business will lead the information governance execution and administration with the help of the Enterprise Architect
- Enterprise Architecture will coordinate the information governance design
- Business will actively participate in the information governance design
- OMB has assigned information architecture to the Enterprise Architect

IT will be an enabler and a catalyst of Information Governance

Data Quality and Usability must be Improved

- Business process is the source of the definitions
- Therefore, you must know the business process to improve the data quality
- Business will establish common definitions
- Business needs to define the data rules and relationships
- IT will translate these into formal models and business rules
- Configuration management will be established

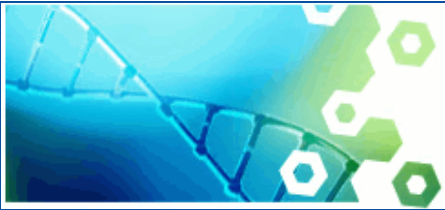
There is more to common definitions than data dictionary





NIH Assessment





Governance Goals

- **Data and Information Goals**
 - Data is well defined in a consistent and controlled manner
 - Defined authoritative data sources exist within NIH
 - Data is provided in a format that is useable to the recipient
 - Information access and reporting is conducted in an accountable, secure, and consistent manner across NIH
- **Operational Goals**
 - Transparent data responsibilities are established to provide clear and distinct roles and responsibilities for governance bodies
 - Systems and other efforts are prioritized based on their long-term implications
 - A well defined and comprehensive decision-making framework is instituted that outlines the priorities, criteria and processes that will be used in the selection of alternatives and solutions in support of NIH's mission





Factors Contributing to the Current Situation

- Federated nature of NIH
- Drivers for standardization have been external requirements





Key Success Factors

- A well-understood benefit proposition that is attractive and relevant to all stakeholders
- A strong leadership to ensure progress and promote change management
- Clear communications in business terminology to ensure understanding by the business
- Business commitment for creating the necessary conditions to achieve the benefits
- Agreement from all stakeholders towards the information governance goals





Risks

	Description	Probability	Impact
IT Threat	NIH resists adoption or collaboration on Information Governance due to the perceived leadership role of IT in its execution	High	High
Information Not Viewed as an Enterprise Asset	Lack of commitment/lack of agreement to treat information as a valued asset with enterprise-wide use that must accordingly be designed and protected at the enterprise level rather than at a specific IC or project asset level	High	High
Expensive to Implement and Execute	Implementing a comprehensive governance structure with formal processes may be expensive, especially in market conditions of budget reductions	High	High
Right Personnel to Manage and Execute	Finding the appropriate personnel with the right mix of skills (understand business and data), personality traits and knowledge of NIH may be difficult	High	Medium
Lack of Commitment	The senior executive management is not committed to endorse or mandate the changes that must be brought about to make the governance structure effective	Medium	High
Culture Shock	The organization cannot support the required culture changes toward the structured approaches necessitated by Information Governance	Medium	High
Change of Leadership	The new NIH Director does not support the Information Governance Structure	Low	Medium
	NIH cannot deliver successes justifying the Information Governance effort	Low	Medium





Information and Information Governance



Governance Structure Framework

Issue Identification

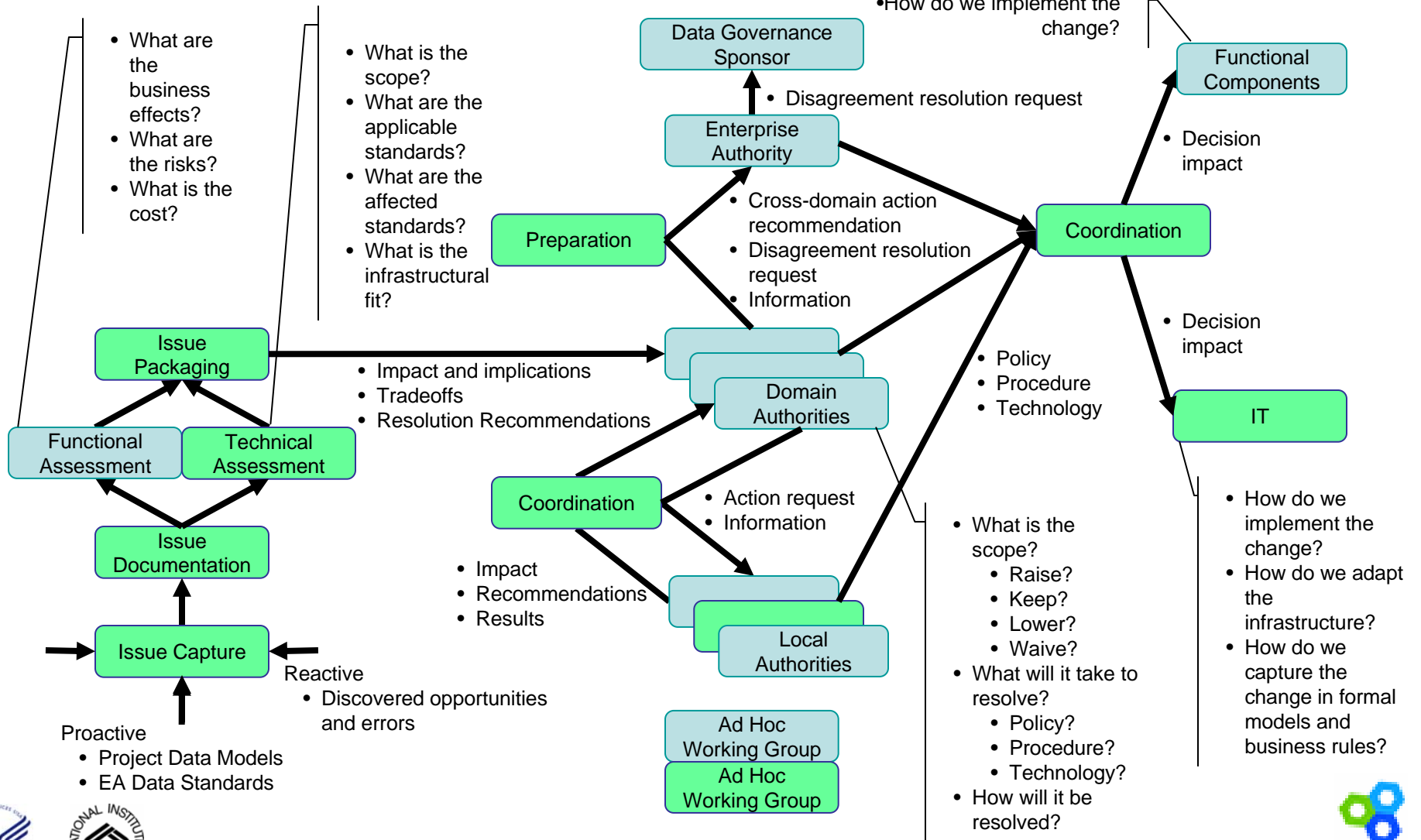
- What are the business effects?
- What are the risks?
- What is the cost?

Issue Resolution

- What is the scope?
- What are the applicable standards?
- What are the affected standards?
- What is the infrastructural fit?

Implementation

• How do we implement the change?





Representative Governance Issues

- What business processes generate the data?
- What is the purpose of the data?
 - How will it be used?
- What are the data standards?
 - What are the common definitions?
 - What is appropriate level of data quality?
- Who are the owners of data?
 - What is centrally or IC owned?
 - What is a cross-functional issue?
 - Who is responsible for reporting what?
- Who creates or generates the requirements for information?
- Who can access and view the data?
 - How can IT ensure proper access to data?
- What are the common and accepted data tools?
- What infrastructure and systems must be in place?
 - How do we match the infrastructure to the data needs?
- What is the assigned physical authoritative data source for the data?
- How can information be formally captured, stored and communicated?

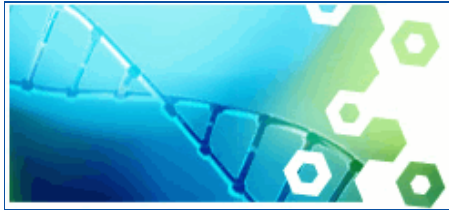
Note: IT activities are in green





Approach





Recommended Implementation Evaluation Approach

- A phased approach to building an Information Governance program
 - Phase 1: Preliminary needs assessment
 - Phase 2: Detailed needs assessment and design of Information Governance program
 - Determine the details
 - Identify a pilot
 - Phase 3: Conduct pilot
 - Phase 4: NIH-wide implementation

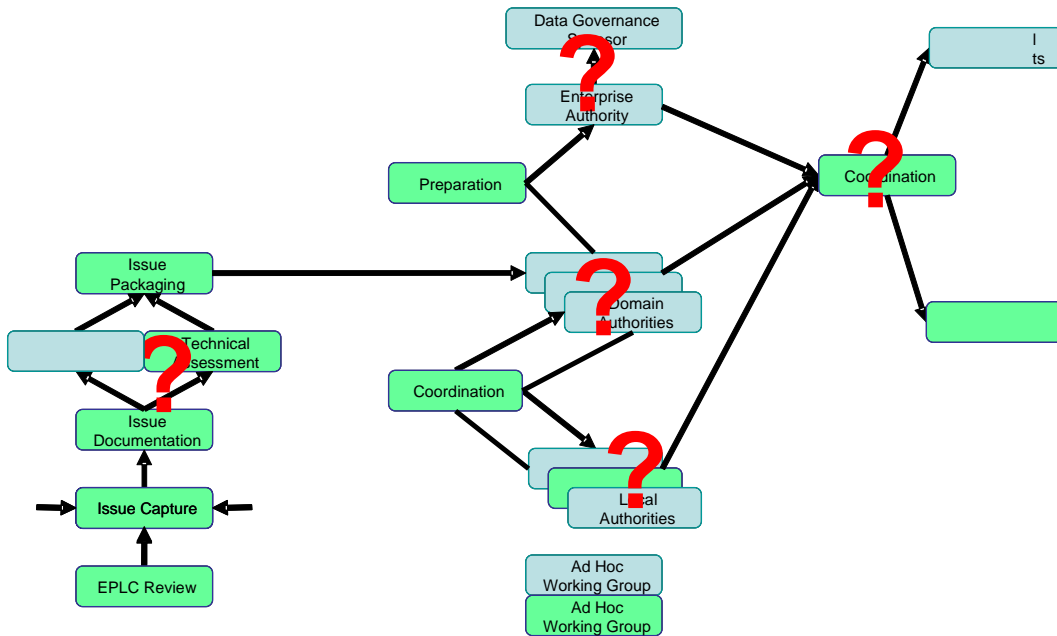




Phase 2

Design the Information Governance Program

- Determine the details
 - Designate Bodies
 - Roles and Responsibilities
 - Charters and Functional Statements
 - Formulate Processes (Cross-Domain and Domain-Specific)
 - Process Models
 - Deliverables
 - Handoffs
 - Metrics
 - Define Structure
 - Covered Issues
 - Decision factors and frameworks
 - Estimate Resource Requirements
 - Staff
 - Budget
- Identify a pilot



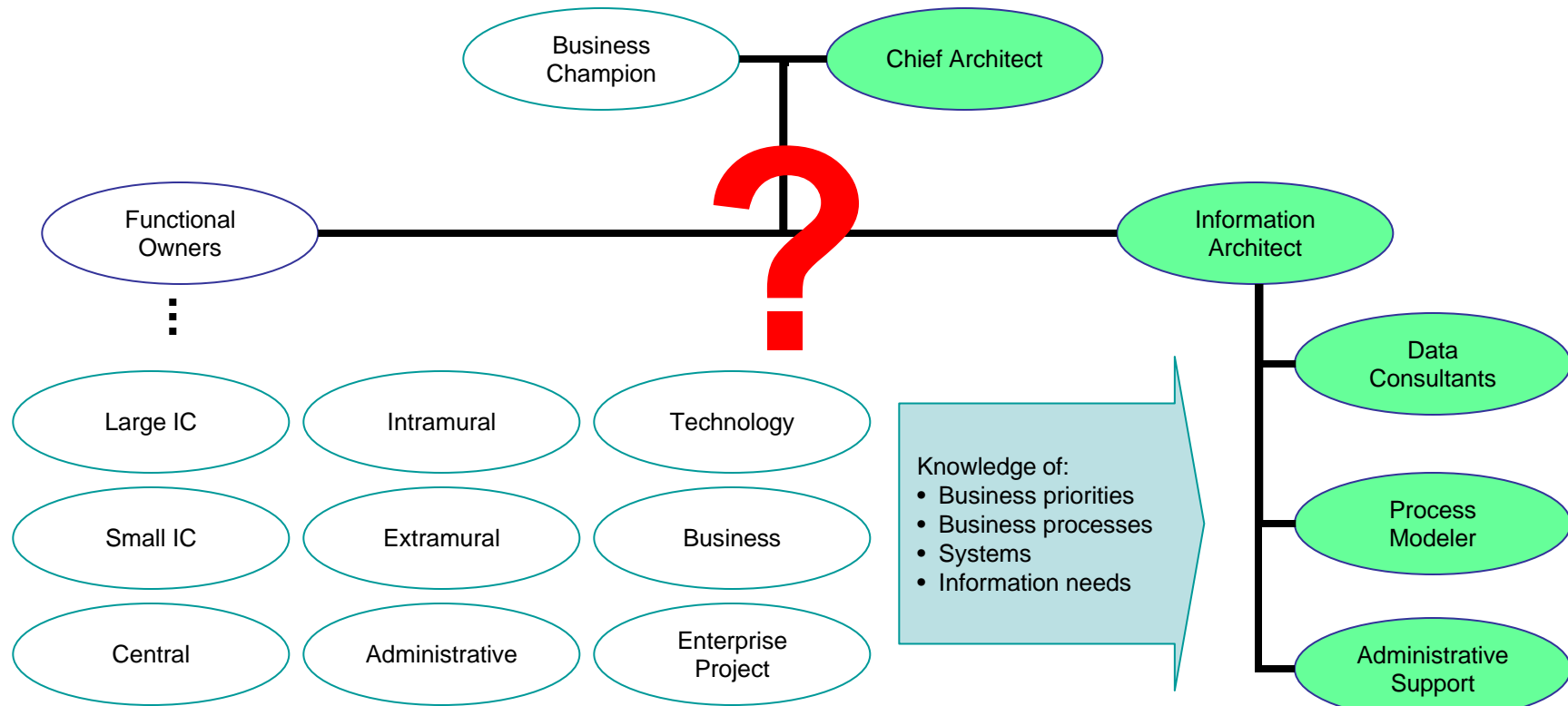


Way Forward for Phase 2





Governance Process Design Team





Key Decisions

- Where we are today?
 - We all agree that we have a need for Information Governance
- What do we need to decide today?
 - Can you support the proposed approach?
 - Can you support the proposed team structure?
 - Data Governance Sponsor - Raynard
 - Business Champion
 - Functional Owners
- What do we need from you to be successful?
 - Provide suggestions and personnel to collaborate with the team
 - Propose people to interview and bodies to examine
 - Identify information issues to use as scenarios for information governance design
 - Select a pilot program to test the information governance design





Contact Information

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The NIH Enterprise Architecture Community

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Email: EnterpriseArchitecture@mail.nih.gov





Back Up Slides





Interviewee List

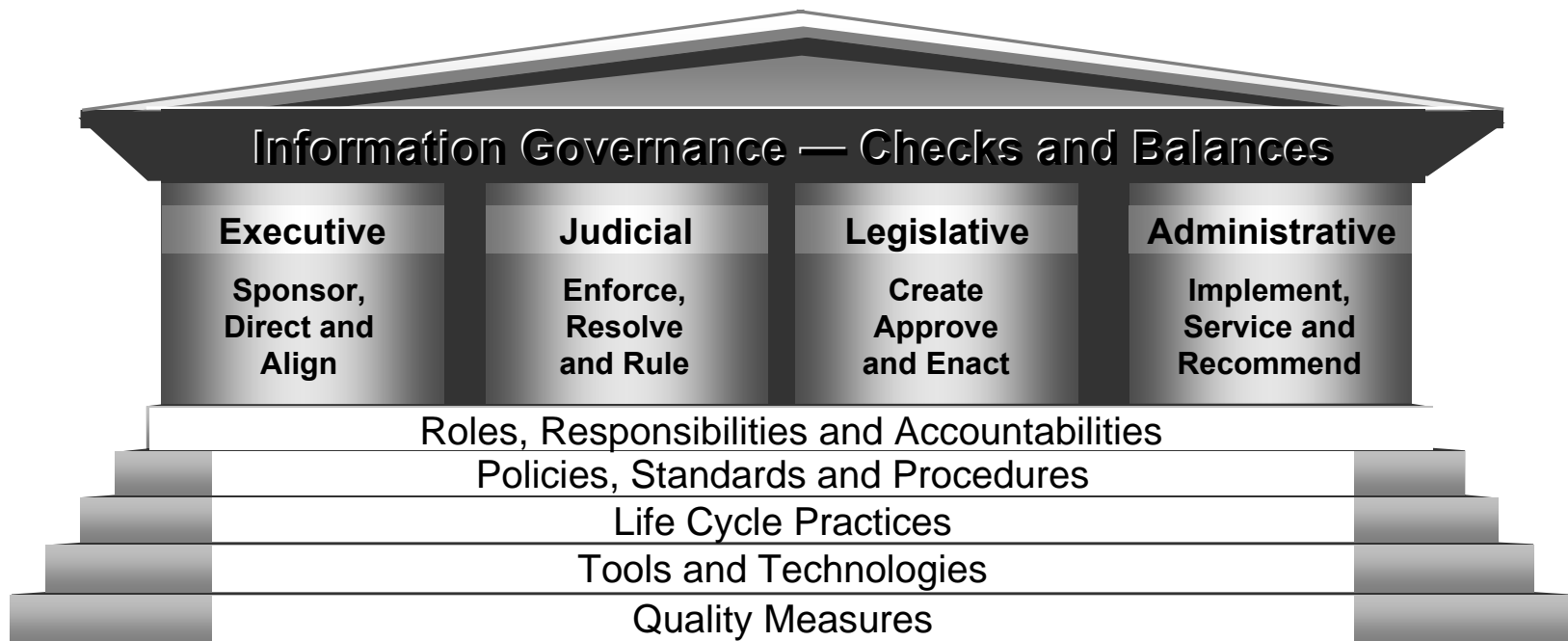
Name	Title	Organization	Date
Richard G. Wyatt, PhD	Executive Director	Office of Intramural Research	April 11, 2008
Timothy Hayes	Chief	Portfolio Analysis and Scientific Opportunities Branch, Office of Portfolio Analysis and Strategic Initiatives (OPASI)	April 14, 2008
Ms. Colleen Barros	Deputy Director and Chief Financial Officer	Office of Management	April 15, 2008
John "Jack" F. Jones, PhD	Chief Information Officer	Office of Director	April 16, 2008
Jeremy Berg, PhD	Director	National Institute of General Medical Sciences (NIGMS)	April 24, 2008
Lana Skirboll, PhD	Director	Office of Science Policy (OSP), Office of Director	April 24, 2008
Norka Ruiz Bravo, PhD Sally Rockey	Deputy Director Acting Director	Office of Extramural Research	April 28, 2008
John J. McGowan	Director	Office of Science Management & Operations (OSMO), National Institute of Allergy and Infectious Diseases (NIAID)	April 29 2008
John Bartrum Michael Boyle Louis Mauney	Associate Director Branch Chief, Budget Analysis	Office of Budget	May 5, 2008
James J. Cimino, MD Elaine Ayers,	Chief Assistant Director	Laboratory of Informatics Development, NIH Clinical Center Ethics and Technology Development, NIH Clinical Center	June 10, 2008





Information Governance Framework

Information governance is the specification of decision rights and an accountability framework to encourage desirable behavior in the valuation, creation, storage, use, archival and deletion of information. It includes the processes, roles, standards and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals.





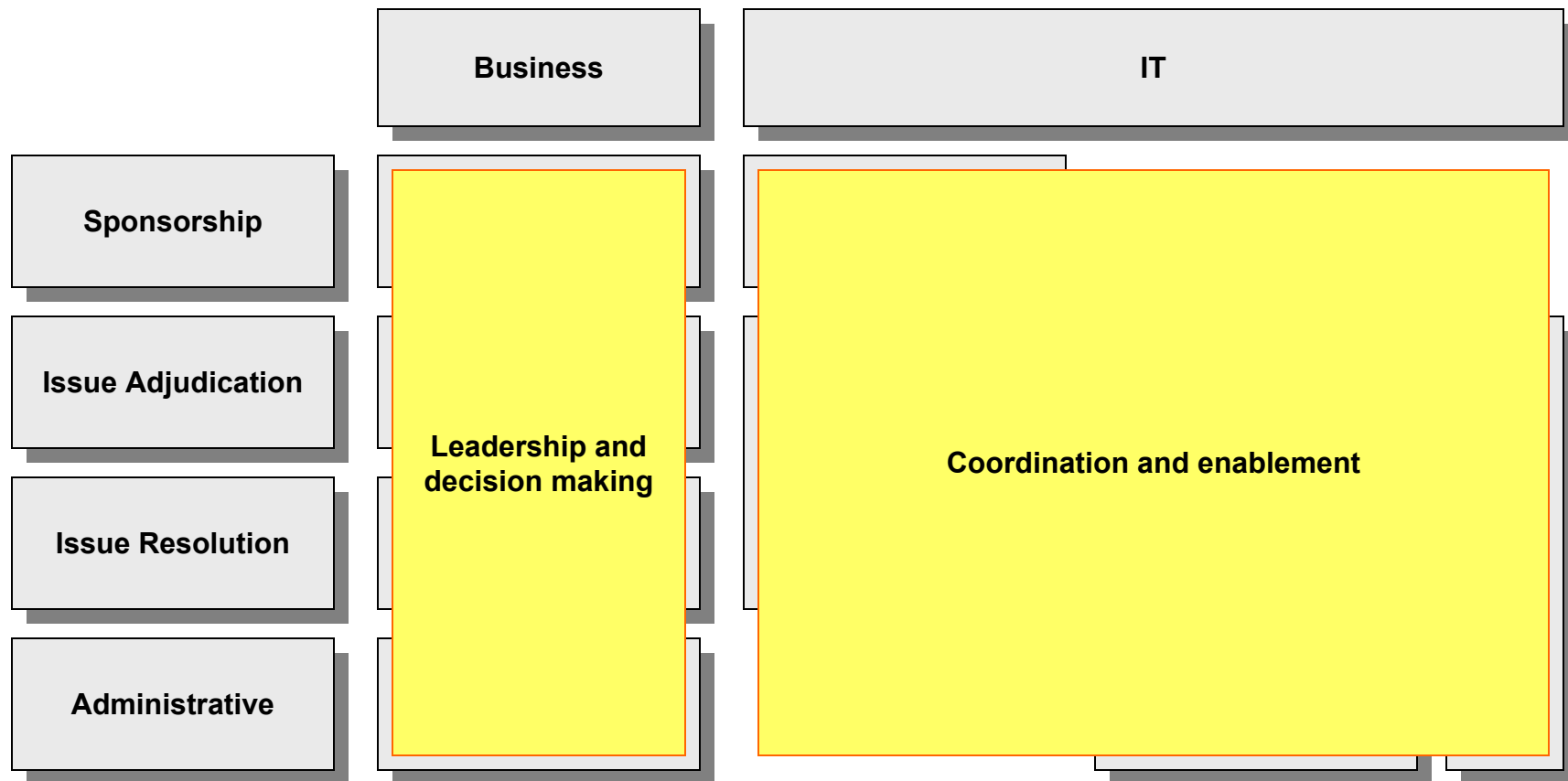
Skills

	Business	Technical
Understanding of functional issues	√	
Understanding of cross-functional issues	√	
Balancing priorities	√	
Understanding the role of information plays in achieving business objectives	√	
Fluency with systems and applications	√	√
Identifying impact on data and systems	√	√
Training users in governance use and application	√	√
Understanding implications on infrastructure		√
Understanding of how to access and manage data		√
Understanding of tools and technologies		√
Understanding of the design and access characteristics of data sources		√
Architecture and data management skills		√
Data administration and metadata management skills		√



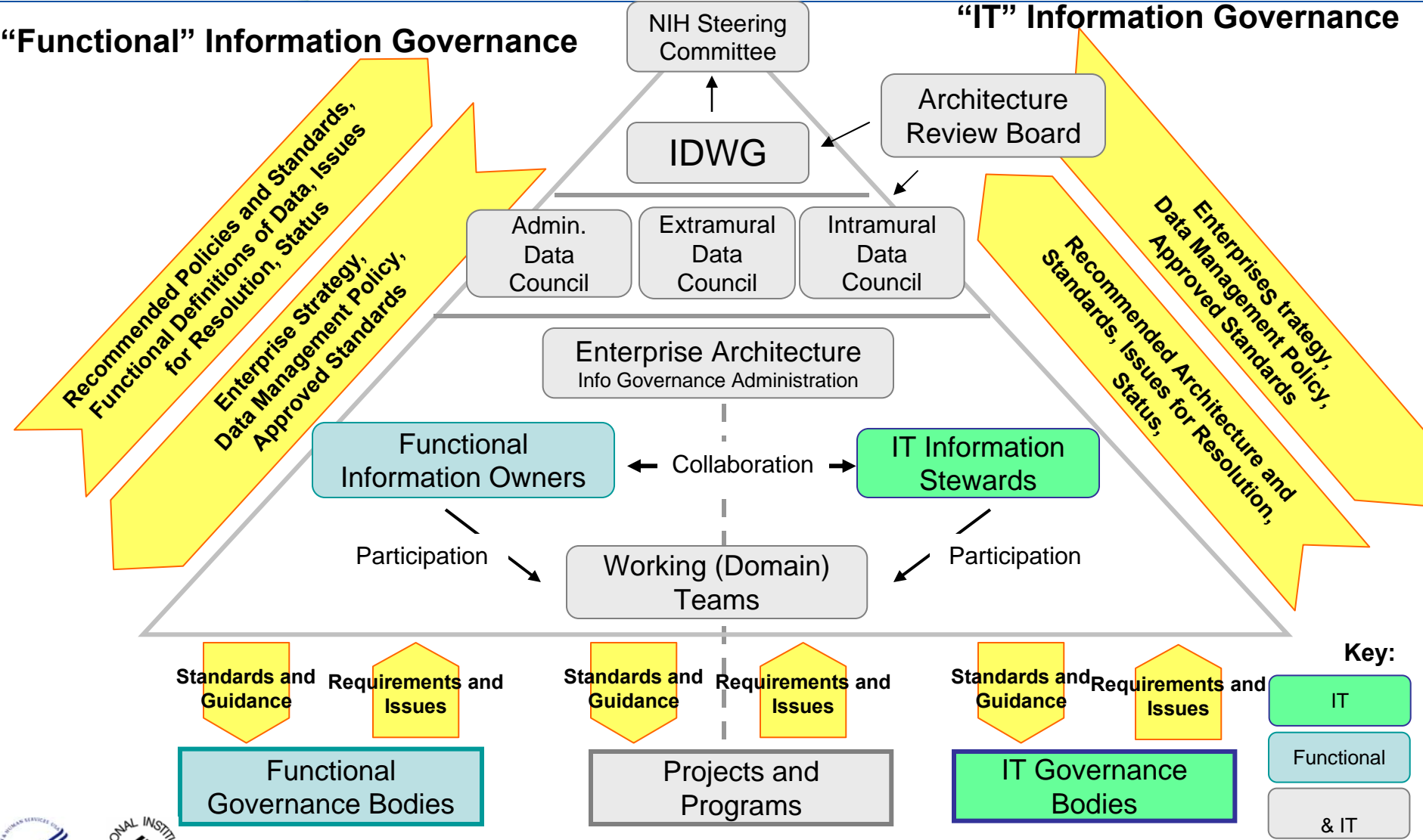


Roles





Conceptual Structure





Participants

- **NIH Steering Committee**
 - Ultimate decision authority in key policy matters
- **Information and Data Working Group**
 - Decides on resolution of policy issues that cross business area boundaries
- **Administrative Data Council**
 - Recommends resolution on policy issues impacting data within the administrative domain
- **Intramural Data Council**
 - Recommends resolution on policy issues impacting data within the intramural domain
- **Extramural Data Council**
 - Recommends resolution on policy issues impacting data within the extramural domain
- **Architecture Review Board**
 - Acts as mediator, consultant and advisor
- **ITMC and EA Subcommittee (IC CIOs)**
 - Provide review and recommendations for the ARB regarding the technical aspects of proposed data standards information management strategies
- **Enterprise Architecture (Governance Administration)**
 - Supports the definition of enterprisewide information management strategies and architecture for shared information assets
- **Working/Domain Teams**
 - Support specific activities in information management strategy and architecture definition
- **Business Owners**
 - Enforce information management within their ownership scope
- **IT Stewards**
 - Enforce information management within their stewardship scope





Strawmodel Information Governance

Governance Matrix

Decision Participant	IM Strategy	Business Policy Issues	Enterprise Information Standards	Enterprise Information Policy	Data Standards (Quality, Security, Retention)	Enforce/Implement Data Standards	Data Definition Changes	Governance Processes
NIH Steering Committee	Decide	Decide						
Information and Data Working Group (IDWG)	Decide	Decide?, Recommend?	Decide	Decide	Decide	Resolve Issues	Decide	Resolve issues
ARB			Decide					Define
Functional Data Committees (EDC, ADC, IDC)		Recommend	Recommend		Recommend	Execute	Recommend	Recommend
ITMC and EA Subcommittee			Recommend					
Enterprise Architecture (Governance Administration)	Define		Recommend, Define	Recommend, Define		Execute	Execute	Execute
Working/Domain Teams	Define		Define	Define				
Business Owners					Recommend	Execute	Recommend	
IT Stewards						Execute	Recommend	





Sample Scenarios for Pilot

- An approach to information management through the implementation of Enterprise Repository that integrates administrative and extramural information to address the need for integrated information across business areas
- The requirement for tracking “new investigators” within NIH
- Subprojects are tracked within the eRA system to allow components of larger grant funded research projects to be tracked individually
- Budgeting is categorized and done in multiple different and inconsistent ways by the ICs
- Checkbook or Enterprise Tracking and Analysis initiative is to provide the grant program managers with flexibility to manipulate their budgets. This identifies the need for reporting





Governance Scenario

Strategy and Alignment

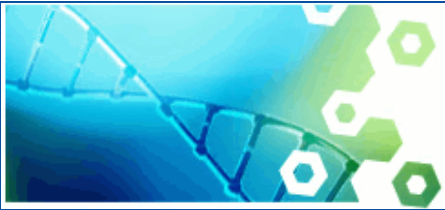
Situation

An enterprise approach to information management has been proposed that involves the implementation of Enterprise Repository that integrates administrative and extramural information to address the need for integrated information across business areas. How is this overarching strategy approved for further planning and eventual execution?

- EDC
- IDWG
- Enterprise Architecture
- ARB
- Working Team(s)

1. Need for an NIH-wide approach is recognized based on reporting challenges associated with reauthorization.
2. OCIO is charged with formulation of an approach.
3. Enterprise Architecture Team brings together a Working Team to develop an initial approach including technical and business stakeholders.
4. Working Team develops initial approach.
5. Approach is reviewed by EDC. EDC provides feedback on the alignment of the approach with business need and guidance on securing funding for further analysis/creation of a strategy.
6. Working Team develops more detailed strategy for enterprise information management and transition roadmap.
7. Strategy is reviewed and recommended for approval by EDC from business alignment perspective and the ARB from an architectural alignment perspective.
8. IDWG provides final approval for detailed strategy, cost, and transition roadmap.





Governance Scenario

Issue Resolution

Situation – NIH wide Impact

The requirement for tracking “new investigators” has become a priority within NIH. There is an interest in training and research funding of “new investigators” and who are need to be funded earliest in their research career. There is a need to leverage this information to report and understand how NIH-funded researchers are furthering NIH’s biomedical research.

This leads to a number of open questions:

- What are the standard definitions of new investigators, pre-doctoral and post-doctoral?
- What is the solution and what is the cost to implement? What are the potential impacts to the system?

Participants

- RCDC
- Enterprise Architecture
- eRA Team

Governance Step

1. EDC with RCDC identifies the need to define a “new investigator”
2. Enterprise Architecture works with the RCDC and the eRA team to develop a summary of the issues for presentation to the EDC, IDC and ADC.
3. The trios of data councils assess the issue and determines a course of action(s) that may include further investigation as impacts to the system and whether. (E.g., What are the processes that are impacted? Where might the data sources exists – eRA, IC extension systems? What is the ability to quantify/evaluate “people” qualifying as new investigators?)
4. The EDC, IDC and ADC task Enterprise Architecture and the eRA team to develop alternatives to address the issues presented.
5. Alternatives are evaluated and a recommendation for resolution is escalated to the EDC, ADC and IDC.
6. EDC, ADC and IDC recommend the selected and approved alternative to IDWG
7. The IDWG approves the recommended alternative.
8. The selected alternative is implemented by the eRA team with guidance from OCITA.

Outcome

A plan of action has been formulated to address the issues presented.





Governance Scenario

Issue Resolution

Situation – NIH wide impact

Subprojects are tracked within the eRA system to allow components of larger grant funded research projects to be tracked individually. There is a need to leverage this information more effectively for reporting. Currently, subproject budget information does not reconcile with overall grant amount. This leads to a number of open questions:

- What are the rules that should be used to reconcile subproject budgets with the overall grant?
- What, if anything, should be done to correct historical information about subproject budgets?

Participants

- RCDC
- Enterprise Architecture
- eRA Team

Governance Step

1. RCDC identifies a need to report on subproject information and discovers the inconsistencies in existing data. The issue is escalated to the data governance process.
2. Enterprise Architecture works with the RCDC and the eRA team to develop a summary of the issue for presentation to the EDC.
3. EDC assesses the issue and determines a course of action that may include further investigation as to the volume of the issue. (E.g., What percentage of grants have subprojects which do not sum to the total grant budget appropriately? What is the root cause of the issue?)
4. EDC tasks Enterprise Architecture and the eRA team to develop alternatives to address the issues presented.
5. Alternatives are evaluated by the EDC and a recommendation for resolution is escalated to the EDC.
6. The EDC approves the recommended alternative.
7. The selected alternative is implemented by the eRA team with guidance from OCITA.

Outcome

A plan of action has been formulated to address the issues presented.





Governance Scenario

Issue Resolution

Situation – Solution specific issue/Lower level issue

Budgeting is categorized and done in multiple different and inconsistent ways by the ICs. Some offices grouped the budgets by the science and then re-classified them by the different mechanisms. Other offices did their budgets first by mechanisms and then by science. This has an impact on reporting as the end results were not always consistent.

Participants

- NBS Program Team
- eRa team
- ICs

Governance Step

1. NBS team identifies the issues with the inconsistencies of classifying the budgets amongst ICs
2. NBS team works with each IC representative to identify the issue and provides a recommended solution that can provide consistency in the groupings and classifications
3. NBS team provides a recommendation to streamline and rationalize the budget classifications using the NBS software which would be to classify by mechanism used and then by a project classification code (which would include the area of science)
4. All ICs now use this consistent process to classify their budgets therefore streamlining the process

Outcome

A plan of action has been formulated and executed to address the issues presented an





Governance Scenario

Issue Resolution

Situation – NIH-wide impact

Checkbook or Enterprise Tracking and Analysis initiative is to provide the grant program managers with flexibility to manipulate their budgets. This identifies the need for reporting. This leads to a number of open questions:

- What are the rules that should be used to reconcile current and historic budget data?
- How should the impacts to NBS, eRA and any potential processes be addressed?

Participants

- Enterprise Architecture
- eRA Team
- IDWG
- EDC, IDC, ADC

Governance Step

1. EDC identifies a need to provide flexibility in budgets for grants processes. Understanding that the flexibility is required for all types of budgets than just for grants, necessitates the need to plan for rules, process changes, etc,
2. Enterprise Architecture works with the EDC, ADC and the eRA team to develop a summary of the issue for presentation to the EDC, IDC and ADC
3. EDC, IDC and ADC assess the issue and determine a course of action that may include further investigation as to the volume of the issue.
4. The trio of data councils task the eRA team, NBS team and the Enterprise Architecture team to develop alternatives to address the issues presented.
5. Alternatives are evaluated by the EDC, IDC and ADC and a recommendation for resolution is escalated to the IDWG.
6. The IDWG approves the recommended alternative.
7. The selected alternative is implemented by the collaborative effort of the eRA team and NBS team with guidance from OCITA.

Outcome

A plan of action has been formulated to address the issues presented.



Examples of Business Benefit

Organization	Challenge	Solution	Results
British Telecom (BT)	<ul style="list-style-type: none"> New services must be delivered to address reduction in revenues due to intense competition and change. Accurate data for rapidly analyzing business performance and assessing new business opportunities is mission critical. Transparency of operations and business performance to BT management and external stakeholders is mandatory Improve customer satisfaction achieved only if data used to drive customer interactions is of the highest possible quality 	<ul style="list-style-type: none"> Initial attempt was to establish an enterprise wide program but soon realized that it had to be more focused due to the lack of awareness, cultural maturity and buy-in across the businesses. Small, tactical pilot projects were initially executed to address problems where the impact of poor data quality was clear and improvements provided direct bottom-line benefits An audit of data cleansing projects enterprise wide and identified the costs of these uncoordinated efforts. By rolling up these costs, a compelling financial argument was made to consolidate and standardize data quality projects. As a result, BT established a data quality center of excellence (COE) by centralizing many of the fragmented data quality skills Approximately 50 dedicated people in the COE, which allocates resources to business-driven IT projects to ensure that data quality controls and monitoring are included from initial design. The COE also selected and deployed standard tools for data quality improvement. It also developed a methodology for data quality projects. A data quality management forum, with a representative from each line of business who are the data quality champions, prioritize data quality projects and control the allocation of resources from the COE. Business managers have data stewardship responsibility, and engage with the COE to help identify new areas for data quality improvement and to determine acceptable levels of data quality. A standard set of data quality metrics derived from experience on many data reconciliation projects was established. These metrics are reported on a weekly basis via a common, generic infrastructure that BT has built using a combination of packaged tools. These reporting capabilities can be readily plugged into new and established applications, with the goal of eventually achieving consistent and pervasive data quality monitoring and to help facilitate correction activities. 	<ul style="list-style-type: none"> Tangible Benefits <ul style="list-style-type: none"> – <i>Capital cost avoidance.</i> As a result of improved accuracy of inventory data, BT can optimize equipment inventory and minimize inventory costs – <i>Productivity gains from successful implementation of business-to-business processes.</i> By resolving data quality issues, BT has gained acceptance of automated interactions with its suppliers and customers, thereby reducing cycle times and removing manual effort. – <i>Improved revenue assurance (in its Global Services line of business).</i> By reducing revenue loss due to inaccurate billing from more than 15 percent to less than 1 percent, BT delivered significant direct increases in revenue Intangible Benefits <ul style="list-style-type: none"> – Customer experience and customer satisfaction have improved via greater accuracy of information used by customer-facing processes – Staff morale has improved due to greater trust of data and productivity benefits from increases in data quality



Examples of Business Benefit

Organization	Challenge	Solution	Results
Chicago Mercantile Exchange (CME)	<ul style="list-style-type: none"> • Strategy to broaden product range in right area and this strategy required better insight into how its customers used the exchange, relative to other exchanges. • Lack of confidence in IT-driven business intelligence projects permeated the business units due to prior series of bloated business intelligence projects that that never delivered business value • Consequently, most lines of business did their own thing, which resulted in a series of independent marts that lacked data quality and consistency 	<ul style="list-style-type: none"> • The project established confidence in business sponsors by initiating a team to gather requirements focused on cross-functional projects with a high level of importance. • The business intelligence initiative was able to eliminate redundant reporting efforts and information inconsistency by establishing a single foundation for data defined in the data warehouse 	<ul style="list-style-type: none"> • InfoSource provides a single source of consistent and reliable information, and performance metrics for all CME stakeholders • The company leveraged existing data warehouses, but focused on identifying highest value subject areas for front-end reporting and analysis projects
Hartford Life Insurance	<ul style="list-style-type: none"> • The Business Intelligence Group's biggest challenge was that Hartford Life had an explosion of data and there was no easy way for business users to assess and leverage the value of that data to help run the business. <ul style="list-style-type: none"> – Product and organizational silos that led to information silos which made it difficult to perform cross-product and organization analysis – Lack of business intelligence skills (including data management/quality skills) available to business managers 	<ul style="list-style-type: none"> • A business intelligence competency center (BICC) with shared business support services, such as BIG at Hartford, can make business users handle information and analysis more effectively, and become better managers of their business operations as a result. • Starting small and demonstrating success are good approaches to credibly tackling • larger organizational challenges such as "silos" of information and skills, and skeptical users. But be positioned to manage the expanded demand and challenges with more direct senior-management sponsorship and expanded funding models. • Work with IT departments to scale up and support larger deployments beyond initial project implementations by the BICC 	<ul style="list-style-type: none"> • Improved reporting and metrics for customer retention initiatives across several lines of business



Examples of Business Benefit

Organization	Challenge	Solution	Results
Aera Energy	<ul style="list-style-type: none"> • Non integrated and redundant systems • Inconsistent business and information management processes • Governance by differing standards and data definitions, which led to pervasive data quality problems • Aera estimated that, as a result of these issues, on average 40% of the time of its most critical personnel was spent looking for data, correcting errors, resolving inconsistencies and compensating for quality issues in the data. In addition, poor-quality data led to long analysis cycles and increased decision risk. 	<ul style="list-style-type: none"> • Positioned data quality a critical goal • Establish comprehensive governance structure and stewardship program • Relentlessly striving to change culture • Building reusable infrastructure for monitoring data quality 	<ul style="list-style-type: none"> • Improved productivity: • Increased decision quality and improved analysis • Significant reuse of data assets
Euro Disney	<ul style="list-style-type: none"> • Reduce customer waiting time wherever possible • The business requirements put the burden on technology to predict and quickly detect unacceptably long queues. <ul style="list-style-type: none"> – The technical solutions needed to generate alerts, help analysts recommend corrective actions, help managers make decisions and alert the staff to their new assignments 	<ul style="list-style-type: none"> • A multilevel approach to provide operationally focused BI to its employees. <ul style="list-style-type: none"> – A central control center was built to provide an operational view into the multiple lines of business at the park. – Staffed with analysts from each line of business. – A portal was built for employees, to provide a view of their operational performance metrics against the goals of their own department and others. 	<ul style="list-style-type: none"> • Customer satisfaction is the primary performance indicator that measures success of the operational BI project • In 3Q06, Euro Disney published a customer survey on its Web site, showing that 81% of its guests were satisfied or completely satisfied, 94% intended to come back and 98% intended to recommend the resort

