Business Oriented Information Architecture

Immediate Solutions and Framework for the Future
INTRODUCTION

Creating a sustainable Information Technology (IT) environment continues to be one of the most significant organizational challenges especially when addressing enterprise information needs. Improving IT alignment and responsiveness to the business is a common complaint. Attempts to address this challenge have included methodologies and processes such as case tools, UML, JAD, as well as technology driven solutions such as Enterprise Resource Planning (ERP), Services-Oriented Architecture (SOA) and Master Data Management (MDM). Yet in spite of these methodologies and technology solutions, the core problems remain unsolved. Enterprise architecture (EA) provides a model and framework to help address some of these challenges but the EA methodology still remains technology-driven. However there is one facet of EA that can help bridge the gap between IT and business to provide a business oriented sustainable architecture: Information Architecture.

Information Architecture (IA) delivers a holistic understanding of the current business environment and is used to help solve immediate business challenges while providing a framework for the design of new business oriented solutions. Information architecture helps minimize the risk and provide ample planning for any information technology project.

An information architecture considers the various contexts in which information is used such as lines of business and functions areas such as finance, sales and marketing, or business intelligence, and comprises not only a data model but the metadata required to support all operational systems and internal services such as a data warehouse. An information architecture considers the data and the uses in order to transform the data into useful information, and ensures that an integrated solution is flexible, extensible and is responsive to changing business needs.

An information architecture is used to assess the robustness of IT projects and to validate the completeness of the design to ensure it satisfies both current needs as well as future expectations. An information architecture is used to test business process scenarios and to determine if they satisfy the broader needs of the business such as analytics and reporting. This paper reviews the value proposition for starting an information architecture program and guides the reader as to how to begin development of a business-oriented IA.

Developing an information architecture requires tactics, tools, and techniques for capturing and sharing knowledge. This involves establishing a dialogue between the business and IT in a less technical manner that levels the playing field in making sense of ways to map business challenges to information sharing and utilization needs. Enterprise architecture tools and techniques can be used for information architecture serving a critical need as a knowledge repository.

THE BENEFITS OF BUSINESS-DRIVEN INFORMATION

Information architecture provides a set of guidelines intended to establish that dialogue between business partners and their Information Technology professionals. IA facilitates the solicitation and capture of business needs and expectations. Discussions encompassing information requirements in support of business processes and activities, and IT-business interactions revolving around core information entities (such as customer, order, product, or invoice) as well as the cross-functional sharing and use of information act as the catalyst for dialogue. The processes provided by IA provide a systemic view of information, incorporates tools, notations, and models to engage business and IT in simplifying the use of a complex web of data.
IA provides a framework by which the business and IT can explore various solutions for reasonableness, and the simplification and clarity emerge as business needs, data descriptions, models, and process maps are created as part of the IA process, creating opportunities to:

- Ensure continuing alignment to business needs,
- Provide business oriented solutions,
- Improve information quality and usability.

This in turn supports technology solutions to:

- Ensure simplicity in application design,
- Reduce replicated functionality,
- Support Services-Oriented Architectures,
- Identify quick win solutions, and generally
- Provide Systemic Sustainability.

From a technology perspective, information architecture helps to identify opportunities to reduce data duplication and to reduce information inconsistencies. Identifying the desired cohesiveness of data will help to evaluate the suitability of various solutions such as ERP, SOA, MDM, Knowledge Management, Data Warehouse and Business Intelligence and how they are used to meet business needs.

**INFORMATION ARCHITECTURE: BASICS**

Although some aspects of business information concepts may be captured using system development life cycle (SDLC) processes, these techniques do not reasonably model, let alone maintain the complex relationships that exist between business processes and the numerous information objects. This is where information architecture comes in. Information architecture provides tactics, models, and a methodology for designing and managing information assets so that they are directly linked to business drivers and adequately satisfy business concerns. Information Architecture incorporates these fundamental areas of focus:

- A **Business Model**, consisting of various views of the organization, stakeholders, their concerns and motivations as well as a description of the business processes and functions performed.
- An **Information Model**, consisting of information objects (“entities”), metadata describing those objects, taxonomies for classification of objects, and ontologies for relating information objects;
- A **Methodology** for extracting, analyzing, and capturing the characteristics of business and information objects; and
- **Tools**, such as a repository in which all the artifacts and knowledge created during this process are captured, including the descriptions of the business objects, data objects, metadata, taxonomies, and ontologies. Tools that also support enterprise architecture are preferable, facilitating the alignment of business, information, application and technology architectures into a holistic enterprise architecture.

Information architecture provides a framework for mapping business needs and expectations, process requirements, and underlying information use in ways that help align the business silos and organizational layers in the enterprise. Information concepts, modeled in a way that is independent of line of business, application, business process, function, or department provide flexibility in linking organizational data, metadata, object use, and lineage. Modeling these information objects in reusable ways across functional business domains, enables the design and development of interoperable data-driven applications that function seamlessly with the underlying information models.
STARTING YOUR INFORMATION ARCHITECTURE PROGRAM

In addition to the required success criteria of executive sponsorship, funding and resources for any project, a comprehensive business understanding and identification of business drivers is the key to a successful IA program, which suggests a phased approach as shown in Figure 1.

![Figure 1: The Information Architecture Process](image)

Each phase adds to the body of knowledge, and help to evolve the organization’s information architecture. The key considerations for an information architecture initiative incorporate these phases:

- **Define Needs and Expectations:** This first step involves identifying the current challenges and capturing the future needs associated with information use and sharing, inherent in the individual, siloed, departmental, or functional perspectives and viewpoints on information usability drawn from across the organization. Each set of viewpoints is valid and provides critical insights into the way the business operates, especially when reflecting individual motivations and concerns. Fortunately, methodologies associated with enterprise architecture can help capture the high level requirements associated with these motivations and concerns, such as using OMG’s Business Motivation Model (BMM). Though a process of interviews and business engagement, key business drivers will be used to define the success criteria and provide the primary goals for the information architecture initiative.

- **Ascertain the Scope:** Because information architecture is an enterprise wide initiative, it must include all departments and functions within the organization as well as external partners such as suppliers and customers. Information acquired and published to external entities must be considered to be in scope as well. This step allows for an examination of information use and sharing both internally and externally to the organization in order to ascertain the scope of the information architecture.

- **Alignment:** Information architecture begins by examining other initiatives underway or planned within the organization. Is IA a component of an enterprise architecture program? Are other enterprise wide programs underway such as six sigma or balanced scorecard? Alignment with and support of these initiatives must be considered within the IA initiative.

- **Assess the Current State:** Documenting the state of the inventory of existing information assets is an iterative process that begins by capturing the primary data objects such as *customer* or *product*. At the same time, documenting critical metadata such as reference data and entity characteristics or attributes helps in the development of an initial business model. Although this model may not be comprehensive and all inclusive, it will be sufficient to be used to provide feedback and act as a catalyst for dialogue between the business and IT. From these discussions a determination can be made as to what is lacking in the model and to prioritize additional current state information capture tasks. Recognize that capturing the current state information can be a time consuming and challenging process. Numerous variances in data as well as the realities of business volatility may impact this process, so plans for this phase must be realistic so that resources to support this effort can be secured and continuity of the tasks can be maintained. The business model is used to develop an initial enterprise conceptual data model.
• Define the Future State: A view of the future for information provides the opportunity to identify new information needs. Given the specifications of the needs and expectations and as evaluation of the current state, gaps in the existing information architecture can be identified. Considerations such as the volume, depth, timelessness and use of external sources of data should be explored to construct a plan for the future state information architecture. If solutions such as Enterprise Resource Planning (ERP), business intelligence and data warehousing, or Services Oriented Architecture (SOA) are being considered, their future state information needs should also be captured. A final enterprise conceptual data model can now be developed.

DESIGN PRINCIPLES

These straightforward information design principles guide the information architect in applying good information management and oversight techniques within the context of the business environment.

Design Principle 1: Start with the Information Architecture

Once an information architecture is in place, it becomes the starting point for the data modeling, design, and development to support business process needs. Any opportunity to create or modify a data model whether driven by the definition of new information needs or due to changed needs for existing information must use the information architecture as the starting point. In turn, any new models or changes to existing models must be consistent with the definitions of existing information objects.

Design Principle 2: Enterprise Modeling

Design and development will target a broad deployment: enterprise in scope and global in perspective. Models must fit in to the context of the organization, and not be limited to a function or a business silo.

Design Principle 3: Business Driven

Information architecture will be guided by business value drivers. Business motivations, needs, and concerns provide the context for the definition of information objects.

Design Principle 4: Common Information

Information models will be designed to support maximum reusability, and support holistic usage scenarios so that it reflects the collective view of common concepts, entities, attributes, and relationships.

Design Principle 5: Quality

Ensuring the quality of information will be engineered into the architecture. Data quality will be measured both in quantitative and qualitative terms.

Design Principle 6: Standards

Data names, structures, sizes, and referenced value domains will conform to an agreed-to set of standards managed within a central reference repository that is accessible to all key stakeholders.

Design Principle 7: Align information requirements with data model

All information requirements will directly map to components of the different models, ranging from the high level and business models through the conceptual, logical, and physical models. Definitions related to entities and data elements will be consistent from a logical standpoint and from a schema standpoint, and to the greatest extent possible rely on items defined in the existing information architecture.
Design Principle 8: Information governance
Policies governing the definition and use of information objects will be used to oversee conformance to the information architecture. Processes implementing these policies will be put into place to monitor for and report inconsistencies or variance from expectations.

Design Principle 9: Data Privacy and Security
The information architecture will incorporate policies and guidelines for the protection of personal or personally identifiable data at any point that data is shared or exchanged.

Design Principle 10: Alignment with Enterprise Architecture
The information architecture will be aligned with the horizontal processes as well as the vertical functions as described and managed within an enterprise architecture program. The information architecture will leverage the methods used by the enterprise architects and use complementary tools and technologies.

THE ENTERPRISE INFORMATION MODEL
Transitioning from a siloed environment and attempting to establish improved responsiveness to business demands while reducing costs is a challenging initiative, and must be grounded in what we can refer to as a consensus architecture for managing information. A consensus architecture is one that incorporates the various viewpoints within the organization. A consensus architecture is not an optimized technology solution but an optimal business-oriented solution. When applying the design principles to develop the consensus architecture, the result is and information architecture and information management framework that is the centerpiece of a holistic business environment.

A design for an architected product and services platform requires an enterprise conceptual business model supported by a conceptual data model. This conceptual data model can be used to determine the common business processes, data and services across all product lines and services, departments and functions. In turn the information architecture becomes the foundation for applications, systems, and databases, as well as the services supporting business operations that are organized around the conceptual data model. This includes the primary business services such as sales, customer support, as well as infrastructure services such as Human resources, Finance, and Business Intelligence. This architecture can be examined to determine if it meets the various needs of all the constituents in the business by mapping back to the business model. This is the first deliverable when considering an integrated solution.

CONSIDERATIONS FOR A SUSTAINABLE INFORMATION ARCHITECTURE
If the benefits of the information architecture involve the conceptualization, design, and implementation of information and data models to support enterprise-wide business needs, the main challenge is ensuring that all analysts, designers, and developers use the IA most effectively in maintaining open communication between business and IT. And since the information architecture provides that models and artifacts than can be used on a continuing basis to facilitate the dialogue between business and IT and to provide ongoing value, it must be maintained and evolved.

Information architecture is much more than an intellectual exercise or a time-boxed project. It is a program and philosophy, and at its core must be firmly embedded within other organizational tasks and process such as the stages of the system development life cycle and business process management to ensure continuing value.
Information architecture can help organizations make immediate improvements while developing a framework for the future and these steps can be taken to get started with your information architecture effort:

1. Examine the various methodologies for IA and select one that is suitable for your organization.
2. Engage the business and IT in joint ownership of IA.
3. Consider how existing vendors have created flexible tools and processes for capturing all the knowledge and artifacts about organizational information.
4. Identify quick wins using the knowledge gained during the IA process.
5. Develop the future IA environment.
6. Establish a sustainable IA program through training and process enhancement.
7. Align the Information Architecture with the corporate Enterprise Architecture initiative.

ABOUT THE AUTHOR
Richard Ordowich is a business/IT consultant with more than 30 years of experience in IT including hardware design and manufacturing, software development, testing and quality assurance, software development methodology and project office and organizational change. Richard has broad global industry experience including government, financial services, insurance, media and information providers, and has also held positions in global product management and sales and marketing. For the past 8 years Richard has focused on data quality, data governance, data standards, data warehouse and master data management.

ABOUT KNOWLEDGE INTEGRITY
Since 1999, Knowledge Integrity, Inc. (www.knowledge-integrity.com) has developed technical and management methodologies for instituting Data Quality, Master Data Management, Data Standards, and Data Governance programs within organizations to enable the analysis, assessment, and improvement of data quality for transactional systems, business intelligence, operational, and reporting purposes. We have provided services to many different organizations, both public and private sector, in many different industries, including Finance, Banking, Insurance, Health Care, Manufacturing, Pharmaceuticals, and Government agencies.

ABOUT SYBASE POWERDESIGNER®
PowerDesigner establishes cross-discipline business and technical definitions for a single version of accurate, key information assets. This capability to incorporate all Information Architecture components enables Sybase PowerDesigner to substantiate its claim to be the “World’s first information architecture tool”. Integrating business and IT metadata, managed by PowerDesigner streamlines an organization’s data governance, business intelligence, integration and consolidation efforts.