SAP Technology

Creating a Business-Oriented Information Architecture

Immediate Solutions and a Framework for the Future

The Best-Run Businesses Run SAP™

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About the Author
Richard Ordowich of Knowledge Integrity Inc. is a business and 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 that includes government, financial services, insurance, media, and information providers, and he has also held positions in global product management and sales and marketing. For the past nine years, Richard has focused on data quality, data governance, data standards, data warehouse, and master data management.

Build a Business-Oriented Information Architecture

This paper reviews the value proposition for starting an information architecture program and shows how to develop a business-oriented information architecture. The initiative requires tactics, tools, and techniques for capturing and sharing knowledge and establishing a dialogue between the business and IT, so you can map business challenges to information sharing and utilization needs. SAP® Sybase® PowerDesigner® software can help you in your information architecture initiative.

ALIGNING IT WITH THE BUSINESS

Creating a sustainable IT environment continues to be one of the most significant organizational challenges, especially when addressing enterprise information needs. Improving IT alignment and IT responsiveness to the business is a common complaint.

Find the Right Model

Attempts to address this challenge have included using methodologies and processes such as computer-aided software design tools, unified modeling language, and joint application design, as well as technology-driven solutions such as enterprise resource planning (ERP), service-oriented architecture (SOA), and master data management (MDM). Yet in spite of these methodologies and technology solutions, the core problems of creating sustainability and improving alignment between IT and the business remain unsolved.

Enterprise architecture provides a model and framework to help address some of these challenges but this methodology still remains technology driven. There is, however, one facet of enterprise architecture that can help bridge the gap between IT and business to provide a business-oriented sustainable architecture: information architecture.

Bridge the Gap with Your Information Architecture

Information architecture helps to provide a holistic understanding of your current business environment. You can use it to help solve your immediate business challenges while accessing a framework for the design of new business-oriented solutions. Information architecture helps minimize risk and provide ample planning for any IT project.

Information architecture considers the various contexts in which your information is used; for example, lines of business and functional areas such as finance, sales, marketing, and business intelligence (BI). It comprises a data model and also the metadata you need to support all operational systems and internal services such as a data warehouse. Information architecture considers the data and its uses in order to transform the data into useful information, and it helps ensure that an integrated solution is flexible, extensible, and responsive to changing business needs.

Assess and Validate Project Designs and Business Processes

You can use information architecture to assess the robustness of your IT projects and validate the completeness of their design, so you can be sure that they satisfy both current needs as well as future expectations. You also can use information architecture to test business process scenarios to determine if they satisfy the broader needs of the business, such as your analytics and reporting requirements.

Get a Dialogue Going Between Business and IT

Developing your 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 helps all participants make sense of ways to map business challenges to your information sharing and utilization needs. Your enterprise architecture tools and techniques can be used for creating your information architecture, which can serve a critical need as a knowledge repository.

THE BENEFITS OF BUSINESS-DRIVEN INFORMATION

Information architecture comprises a set of guidelines intended to establish that dialogue between your business and IT professionals. Information architecture makes it easier for people to solicit and capture business needs and expectations. The catalyst for dialogue lies in your organization's discussions: the ones that encompass information requirements in support of your business processes and activities; the interactions between IT and business revolving around core information entities (such as customer, order, product, or invoice); and the cross-functional sharing and use of information. The processes provided by information architecture provide a systemic view of information and incorporate tools, notations, and models to engage business and IT in simplifying the use of a complex web of data.

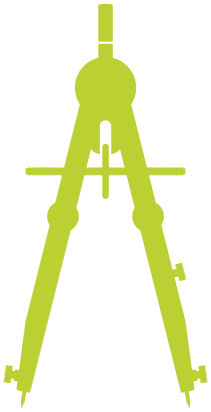
Information architecture provides a framework by which the business and IT can explore various solutions for reasonableness. Simplification and clarity emerge as business needs, data descriptions, models, and process maps are created as part of the information architecture process, creating opportunities 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 service-oriented architectures
- Identify quick-win solutions
- Provide sustainable systems

From a technology perspective, information architecture helps to identify opportunities to reduce data duplication and to reduce information inconsistencies. Knowing how cohesive your data needs to be will help you in evaluating the suitability of various solutions such as ERP, SOA, MDM, knowledge management, data warehousing, and BI and how they can be used to meet your business needs.



SAP Sybase PowerDesigner software can help you in developing a business-oriented information architecture. It helps with tactics, tools, and techniques for capturing and sharing knowledge and establishing a dialogue between the business and IT.

Information Architecture: Basics

LINK INFORMATION ASSETS TO BUSINESS DRIVERS

Although some aspects of business information concepts may be captured using system development lifecycle processes, these techniques do not reasonably model, let alone maintain, the complex relationships that exist between business processes and their numerous information objects. This is where information architecture comes in.

DEFINE YOUR MODELS

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:

- **Business model** – consisting of various views of the organization, stakeholders, and their concerns and motivations as well as a description of the business processes and functions performed
- **Information model** – consisting of information objects ("entities"), metadata describing those objects, taxonomies for classification of objects, and ontologies for relating information objects
- **Methodology** – for extracting, analyzing, and capturing the characteristics of business and information objects
- **Tools** – such as a repository in which all the artifacts and knowledge created during this process are captured, including the descriptions of 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 your business needs and expectations, process requirements, and underlying information for use in ways that help align the business silos and organizational layers in your enterprise. Modeled in a way that is independent of line of business, application, business process, function, or department, information concepts 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.

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Establish Your Success Criteria

ADOPT A PHASED APPROACH TO DESIGN

In addition to the required success criteria of executive sponsorship, funding, and resources for any project, comprehensive business understanding and identification of business drivers are key to a successful information architecture program. This program suggests a phased approach, as shown in the figure.

Each phase adds to the body of knowledge and helps to evolve the organization's information architecture. The key considerations for an information architecture initiative incorporate these phases, described as follows.

Phase 1: 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 your 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 the Object Management Group's specification for the Business Motivation Model (BMM). Through a process of interviews and business engagements, key business drivers are used to define the success criteria and provide the primary goals for your information architecture initiative.

Phase 2: Ascertain the Scope
Because information architecture is an enterprise-wide initiative, it must include all departments and functions within your organization as well as external partners, such as your 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 your information architecture.

Figure: The Information Architecture Process

Phase 3: Align Your Enterprise-Wide Initiatives
Information architecture begins by examining other initiatives that are underway or planned within your organization. For example: Is your information architecture a component of your enterprise architecture program? Are other enterprise-wide programs under way, such as Six Sigma or balanced scorecard? You must consider alignment with and support of these initiatives within your information architecture initiative.

Phase 4: Assess the Current State
Documenting the state of the inventory of existing information assets is an iterative process. The process begins by capturing 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 is sufficient for providing feedback and acting as a catalyst for dialogue between the business and IT.

From your business and IT discussions, a determination can be made as to what is lacking in the model and to prioritize additional current-state information-capture tasks. Capturing the current-state information can be a time-consuming and challenging process, since numerous variances in data as well as the realities of business volatility may impact this process. Your plans for this phase must be realistic so that you can secure the necessary resources to support this effort and maintain continuity of tasks. The business model is used to develop an initial enterprise conceptual data model.

Phase 5 : Define the Future State
A view of the future for information provides the opportunity to identify new information needs. Given the specifications of your needs and expectations and an 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 you are also considering solutions such as ERP, BI, data warehousing, and SOA, their future-state information needs should also be captured. You can now develop a final enterprise conceptual data model.

Information architecture helps to provide a holistic understanding of your current business environment. You can use it to help solve your immediate business challenges while accessing a framework for the design of new business-oriented solutions.

Design Principles

ADOPTING GOOD MANAGEMENT TECHNIQUES

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

Design Principle 1: Start with Your Information Architecture
Once your information architecture is in place, it becomes the starting point for your data-modeling, design, and development people 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: Use Enterprise Modeling
Design and development target a broad deployment: enterprise in scope and global in perspective. Your models must fit into the context of the entire organization and not be limited to a function or a business silo.

Design Principle 3: Create a Business-Driven Architecture
Business-value drivers should guide your information architecture. Business motivations, needs, and concerns provide the context for the definition of information objects.

Design Principle 4: Share Common Information
Design your information model to support maximum reusability. Your information model must support holistic usage scenarios so that it reflects the collective view of common concepts, entities, attributes, and relationships.

Design Principle 5: Ensure Quality
Be sure to engineer data quality into your information architecture. Data quality is measured both in quantitative and qualitative terms.

Design Principle 6: Enforce Standards
Data names, structures, sizes, and referenced value domains must conform to an agreed-to set of standards. Standards are managed within a central reference repository that is accessible to all key stakeholders.

Design Principle 7: Align Information Needs with Data Model
All information requirements should directly map to components of the different models, ranging from high-level models and business models through conceptual, logical, and physical models. Definitions related to entities and data elements must be consistent from a logical standpoint and from a schema standpoint; and to the greatest extent possible, they should rely on items defined in the existing information architecture.

Design Principle 8: Allow for Information Governance
Oversee conformance to the information architecture using policies that govern the definition and use of information objects. Processes implementing these policies should be put into place to monitor for and report inconsistencies or variance from expectations.

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

Design Principle 10: Align with Enterprise Architecture
The information architecture is aligned with the horizontal processes as well as the vertical functions as described and managed within an enterprise architecture program. The information architecture leverages the methods used by the enterprise architects and uses 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 your organization.

A consensus architecture is not an optimized technology solution but an optimal business-oriented solution. Applying design principles to develop the consensus architecture results in an 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 primary business services such as sales and 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.

Information architecture is much more than an intellectual exercise or a time-boxed project. It is a program and philosophy; and to ensure continuing value, it must be firmly embedded within other organizational tasks and processes.

Considerations for a Sustainable Information Architecture

The benefits of the information architecture involve the conceptualization, design, and implementation of information and data models to support enterprise-wide business needs. However, the main challenge is making sure that all of your analysts, designers, and developers use the information architecture most effectively in maintaining open communication between business and IT. And since the information architecture provides that models and artifacts 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 to ensure continuing value, it must be firmly embedded within other organizational tasks and processes, such as the stages of your system development lifecycle and business process management.

Information architecture can help organizations make immediate improvements while developing a framework for the future. Take the following steps to get started with your information architecture effort:

1. **Review the methodologies** – Examine the various methodologies for information architecture and select one that is suitable for your organization.
2. **Enlist buy-in from your people** – Engage the business and IT in joint ownership of information architecture.
3. **Examine enabling technologies** – Consider how existing vendors have created flexible tools and processes for capturing all the knowledge and artifacts about organizational information.
4. **Start simple** – Identify quick wins using the knowledge gained during the information architecture process.
5. **Look to the future** – Develop the future information architecture environment.
6. **Make it sustainable** – Establish a sustainable information architecture program through training and process enhancement.
7. **Align with corporate initiatives** – Align the information architecture with the corporate enterprise architecture initiative.

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. The company has 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 SAP SYBASE POWERDESIGNER SOFTWARE

You can use SAP Sybase PowerDesigner software to establish cross-discipline business and technical definitions for a single version of accurate, key information assets. Incorporating all information architecture components, and integrating business and IT metadata, SAP Sybase PowerDesigner helps to streamline your organization's data governance, business intelligence, integration, and consolidation efforts.

FIND OUT MORE

To learn more about how SAP can help your organization develop an information architecture, call your SAP representative today or visit us on the Web at www.sap.com/solutions/technology/database/model-driven-architecture/index.epx.

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