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This preview shows selected pages that are representative of the entire course book. The pages shown are not consecutive. The page numbers as they appear in the actual course material are shown at the bottom of each page. All table-of-contents pages are included to illustrate all of the topics covered by a course.

TDWI Business Intelligence Fundamentals

from Data Warehousing to Business Impact

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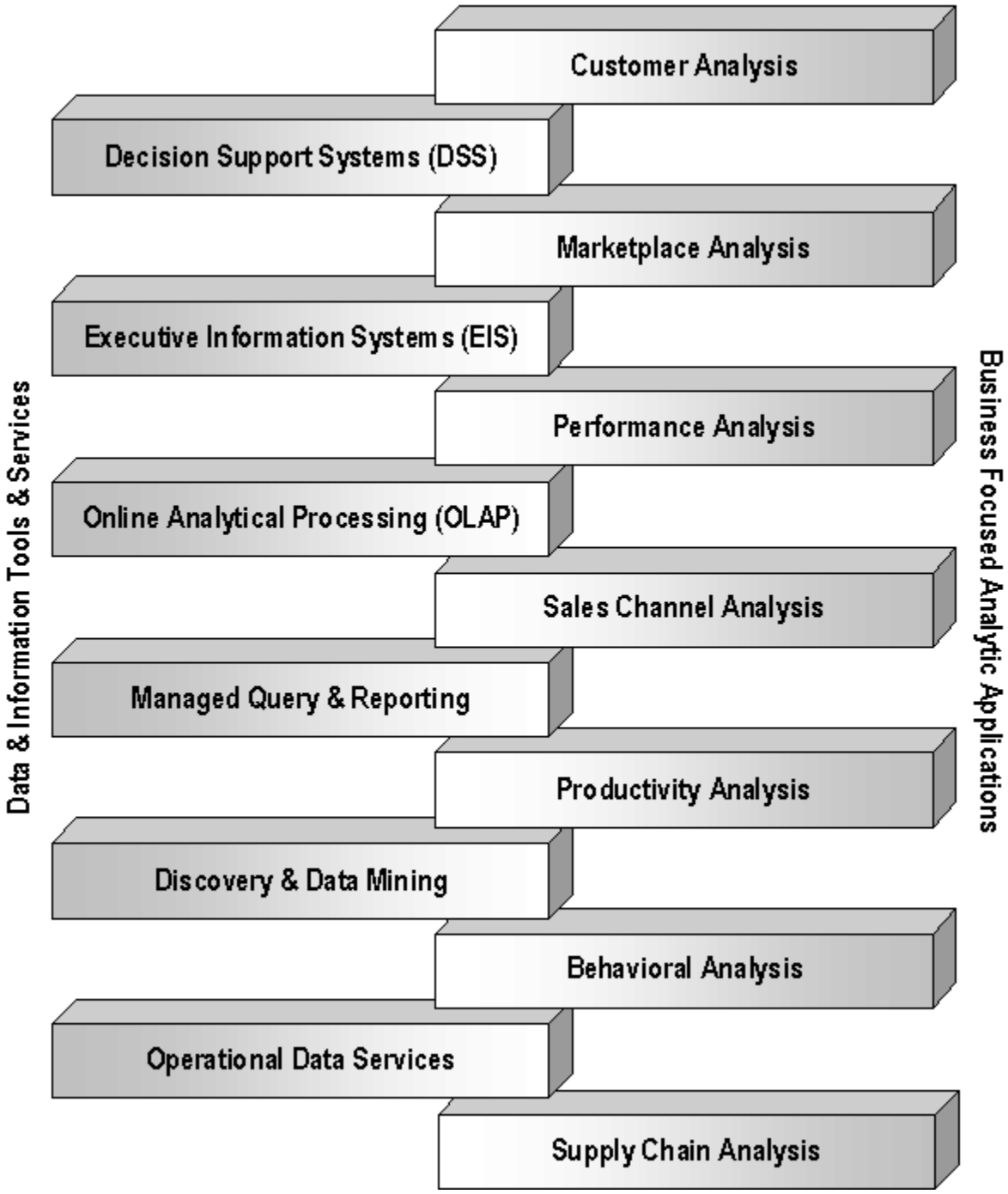
Module 1

Introduction to Business Intelligence

Definitions and Concepts

BI Applications



Definitions and Concepts

BI Applications

TECHNOLOGY SOLUTIONS

Technology solutions deliver information with business context, but without the strong process or application context of business solutions. Common examples include:

Decision Support Systems (DSS)	support managerial decision-making – usually day-to-day tactical
Executive Information Systems (EIS)	provide metrics-based performance information – consolidation, forecasting, analysis, etc. – to support decision making at the senior management level
Online Analytical Processing (OLAP)	tools to support business analysts with capability to perform multidimensional analysis of data (e.g., "what if" analysis of a business problem)
Managed Query & Reporting	provides quick and easy access to business data with such capabilities as predefined reporting applications, wizard driven data access, report formatting and templates, web-enabled query tools sets and end user report writers and publishers.
Data Mining	examines data to discover hidden facts in databases using techniques such as machine learning, statistical analysis, pattern/relationship recognition to the most atomic level data, mining tools infer predictive and descriptive information
Operational Data Services	close the loop of business value by enhancing operational processes and systems, and by providing operational services such as operational reporting that would otherwise require reconciling data from multiple operational databases.

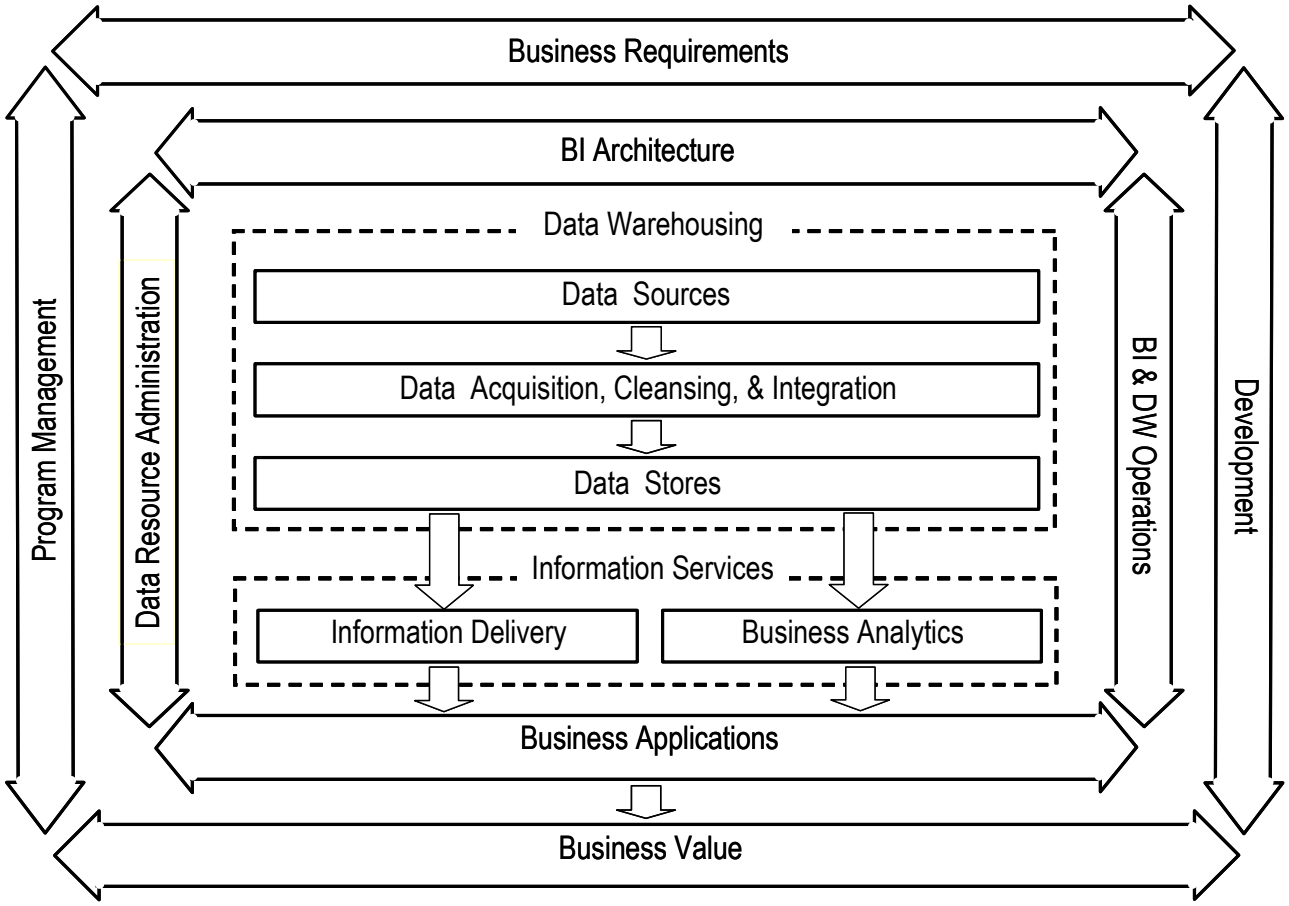
BUSINESS SOLUTIONS

BI business solutions go beyond delivery of information to fill a key role in business outcomes. Common examples include:

Customer Analysis	knowing the customer, maximizing customer value, measuring customer satisfaction and loyalty, etc.
Marketplace Analysis	evaluating the market space – customers, products, competitors, targeted marketing, etc.
Performance Analysis	to optimize and streamline the ways that a business uses its resources – human, financial, equipment, etc.
Sales Channel Analysis	to devise, implement and evaluate sales and marketing strategies, then use feedback to continuously enhance the sales process
Productivity Analysis	business metrics and analysis for activities such as quality improvement, defect analysis, capacity planning, asset management, etc.
Behavioral Analysis	understanding and predicting trends and patterns that provide business advantage, such as: purchasing trends, e-commerce on-line behavior, etc.
Supply Chain Analysis	benchmark, monitor and enhance supply chain activities from materials ordering through product/service delivery

Business Intelligence Frameworks

BI Components Framework



Business Intelligence Frameworks

BI Components Framework

A STRUCTURE FOR BI COMPONENTS

The BI components framework identifies the parts of a BI program and the relationships among them. The framework consists of three layers:

Layer	description
Business Layer	The components needed for BI to fit seamlessly into business organizations, processes, and activities.
Administration & Operation Layer	The components that connect technical components with business components.
Implementation Layer	The technical components needed to capture data, turn data into information, and deliver that information to the business.

BUSINESS LAYER

The business layer is made up of:

Component	description
Business Requirements	The reasons to implement BI, and the kinds of results needed including information needs, essential business metrics, etc.
Business Value	The benefits anticipated from or achieved by BI including such things as increased revenue, improved profit margins, risks mitigated or avoided, reduced costs, etc.
Program Management	The ongoing activities of managing the BI program for maximum business value including establishing enterprise structures and standards, synchronizing multiple and parallel projects, realigning with changing business needs, etc.
Development	The project activities that create and deploy BI and DW products including methodology, project decomposition, project success measures, etc.

ADMINISTRATION & OPERATION LAYER

The administration & operation layer is composed of:

Component	description
BI Architecture	Frameworks, standards, and conventions that describe BI environment components and the relationships among them including business, data, technology, organizational, and project architectures.
Business Applications	Business processes and procedures that access and/or receive information and employ that information to achieve business results.
Data Resource Administration	Policies, procedures, and processes for data governance including data owner, steward, and custodial responsibilities.
BI & DW Operations	Execution, monitoring, and maintaining acceptable quality, availability, and performance of the DW and BI functions and services.

IMPLEMENTATION LAYER

The implementation layer consists of:

Component	description
Data Warehousing	Systems, processes, and procedures to integrate data and prepare it to become information.
Information Services	Systems, processes, and procedures that turn data into information and deliver that information to the business.

Module 2

Business Application Fundamentals

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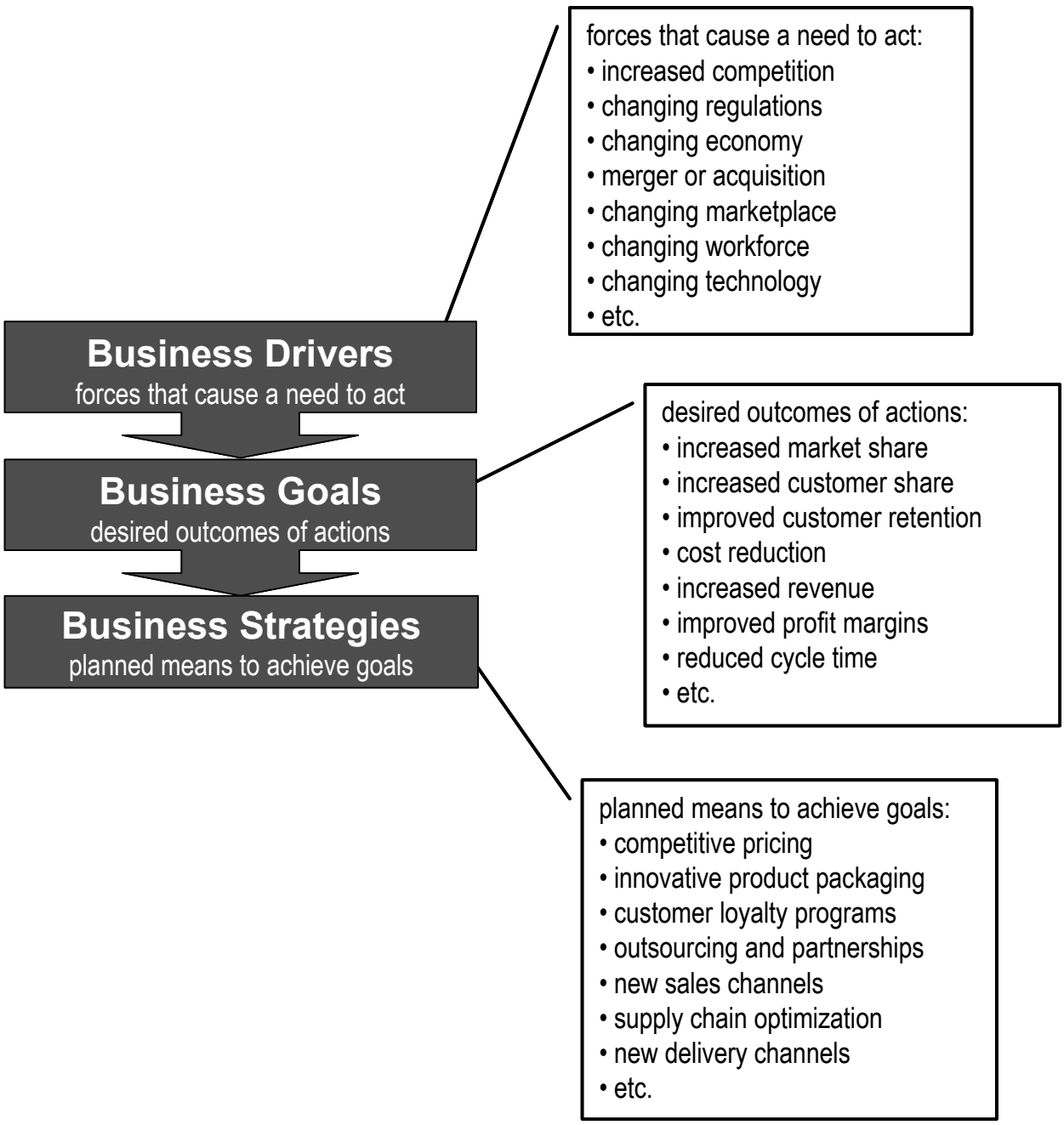
Business Requirements for BI

Business Context - Drivers, Goals, and Strategies



Business Requirements for BI

Business Context – Drivers, Goals, and Strategies

IMPORTANCE OF BUSINESS CONTEXT

Business context determines the nature of the BI program – the business processes to be affected, the kinds of business applications to be implemented, and the information services to provide. Business context provides the means to align BI results with business goals.

BUSINESS DRIVERS

Business drivers are those things that are strategically important in positioning the business to achieve its short- and long-term goals. They are the external forces that have significant influence on operation and performance of a business. Drivers create need to take action, but they don't dictate the actions to be taken. Common business driver examples include changing economy, changing marketplace, and changing regulations.

Business drivers are the foundation of the business case for BI. They are the reasons that intelligence and information are needed. Note that a common element of most business drivers is change. It follows, then, that the drivers themselves will change leading to change in the business case and the information services that are needed.

BUSINESS GOALS

Business goals are the things that the business wants to accomplish to respond to business drivers. Drivers create the need to act. Goals describe the desired outcomes of taking action. Goals are commonly related to financial or operational performance (i.e., cost reduction, generation of revenue, increased market share, etc.) Goals are most effective in setting BI program direction when they are: (1) described by clear, concise, understandable statement, (2) specific enough that level of achievement can be measured, and (3) of high business priority.

BUSINESS STRATEGIES

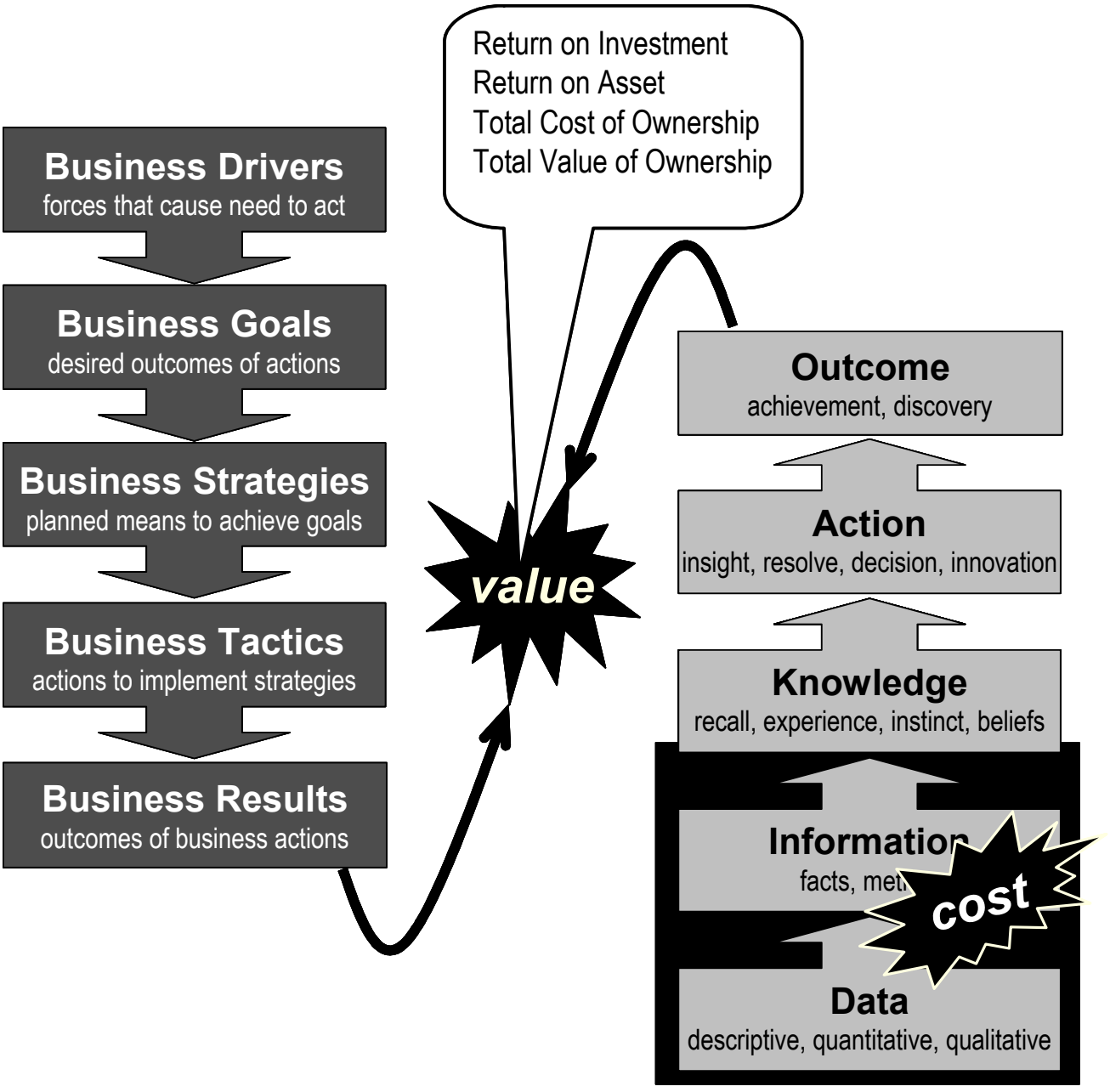
Business strategies are action plans for the business. They describe how the business plans to accomplish its goals. The range of strategies is broad – introducing new products, exploiting new sales channels, pricing competitively, optimizing business processes, etc. Strategies help to determine which business processes are to be information enabled.

USING BUSINESS CONTEXT

Business drivers, goals, and strategies collectively establish context for BI. The drivers describe reasons; they help to define the business case. Goals describe measurable business results; they help to determine metrics and information needs. Strategies describe kinds of actions; they help to identify targeted business processes. Together, from a metrics perspective, they describe why to measure, what to measure, and where to measure.

Business Value

Business Valuation Models



Business Value

Business Valuation Models

THE BUSINESS CASE FOR BI

The minimum business case for BI demands: (1) evidence that benefits are achievable, showing that investment will create a positive return), (2) a foundation to assess results and measure their value, and (3) a means to quantify and allocate costs. Both cost and value can be elusive. Some aspects of each are readily measurable. Others – indirect costs and intangible benefits – may be difficult to identify, and once known may be challenging to quantify. Cost and value assessments need to be performed at the start of a BI program, and continuously throughout the life of that program. Valuation models and metrics include:

Return on Investment (ROI)	ROI is the most common and readily understood of BI program valuation models. Measuring ROI throughout the life of a BI program provides basic metrics to assess BI effectiveness but little information to take corrective action or make improvements. In its simplest form, ROI can be expressed as comparison of value received (revenues generated and costs avoided) with costs incurred within a designated time period. ROI measures for BI programs include many challenges – first in identifying the impact of information, then in determining the value of those impacts. Cost determination may also be elusive, in particular identifying and quantifying indirect costs.
Return on Assets (ROA)	ROA complements ROI for valuation of a BI program. Where ROI measures value relative to expenses, ROI compares value received from BI (revenue generated, costs and risks avoided) with the value of assets essential to BI deployment. Assets to be considered go beyond the obvious technical infrastructure – hardware, software, storage, etc. – to include the data used to provide BI information. Many companies have tremendous, but dreadfully underutilized, operational data assets. BI offers opportunities to increase the value realized from data assets.
Total Cost of Ownership (TCO)	TCO models provide a structure to capture all costs associated with a BI program. Cost categories include hardware, software, staffing, and services. All costs including development, deployment, operation, support, and enhancement are included. TCO is *total cost* of the program from inception to the present. Measuring TCO for multiple time periods (program-to-date, year-to-date, current fiscal period, etc.) provides complete and substantial cost measures to be used in ROI and ROA calculations.
Total Value of Ownership (TVO)	TVO models provide a structure to capture value of all benefits derived from a BI program. Value categories include revenue received, costs avoided, and cost of risks avoided. All Measuring TVO for multiple time periods (matching those for TCO measures.) provides complete and substantial value measures to be used in ROI and ROA calculations.
Time to Payback	Time to payback is a predictive measure that estimates the point in time when TVO will be equal to TCO for a BI program. Regularly estimating time to payback, and monitoring changes in the estimate is useful when managing the BI program.
Dupont Value Realization Method (DVRM)	DVRM is an extension of the common ROA model that shows relationships of profit, sales, and total assets. DVRM focuses on how the business generates returns and how well assets are used to generate sales and revenue. In some BI programs, particularly when goals are sales-oriented, this method may be especially useful in quantifying the value of information impact. For more about DVRM see www.optimizemagazine.com/issue/003/roi.htm.

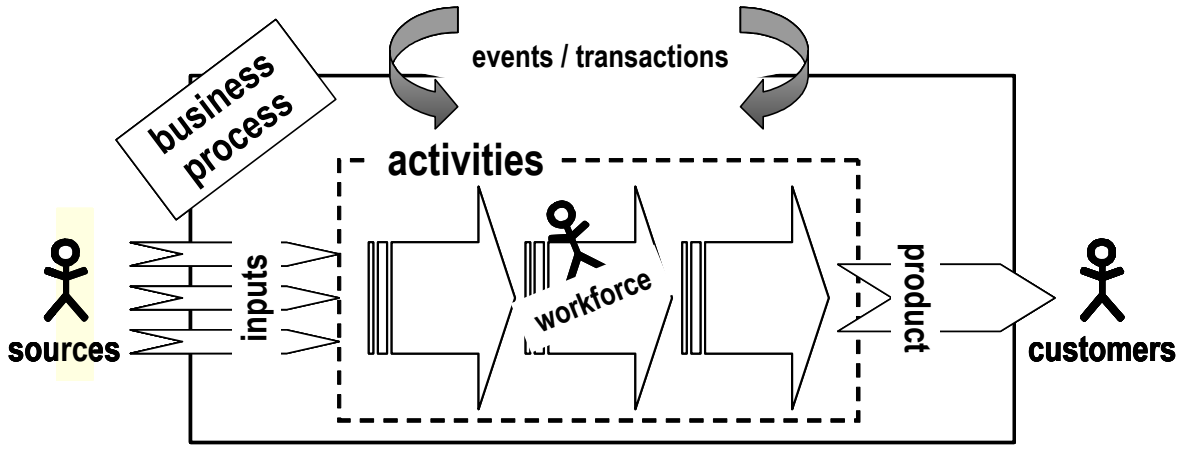
Business Analytics

Business Metrics and Business Management

Metric:
A system of measures based upon standard units.

Business Metrics:
Applied measures that can help a business to identify and monitor key trends in economics, geo-politics, science, technology, and other key factors that are important to its unique objectives.

- **Metrics are standards-based.**
- **A metric is a system. Business metrics are business systems.**
- **Business metrics are used to identify & monitor trends.**
- **Business metrics are tied to business objectives.**



Business Process Management (BPM): [focus on one business process]
source/supplier performance, customer loyalty/retention, product performance, activity cycle time, event frequency, materials defect rate, workforce performance, etc.

Business Performance Management (BPM): [metrics across multiple business processes]
source/supplier performance, product performance, workforce performance, organization performance, financial performance, etc.

Business Activity Management/Monitoring (BAM): [measurment of an activity within a business process]
customer contacts, sales calls, marketing campaign responses, activity costs & accounting, call center responses, waste & rework, interrputions of service, etc.

Customer Relationship Management (CRM): [metrics outside process specific to customers]
customer satisfaction, customer value, customer loyalty, customer behavior, customer retention/attrition, customer preferences, etc.

Supply Chain Management (SCM): [metrics inside & outside process including sources and customers]
fill rates (case, line …), quality (material, product ….), asset utilization, demand forecast accuracy, delivery rate, return rate, etc.

Business Analytics

Business Metrics and Business Management

METRICS-BASED MANAGEMENT

Business metrics are specific, defined, quantifiable indicators of performance or behavior in some aspect of a business. Metrics that are aligned with business goals and defined as standard measures of those goals are most useful for business management. A higher education institution, for example, may set a goal of having all undergraduate students complete a degree in four years. Time-to-degree metrics – measuring by academic discipline, student demographics, financial aid availability, etc. – help to measure achievement of the goal and identify actions that will help to improve time-to-degree performance. Periodic measures over time supply information about trends, provide feedback about effectiveness of previous actions, and help to plan future actions.

Three general business management disciplines are common. BPM has two distinct meanings. It has been used for both *Business Process Management* and *Business Performance Management*. The two are similar in their use of metrics as part of business management discipline. They differ in goals, scope, and kinds of metrics. BAM – *Business Activity Management (or Monitoring)* is yet another metrics-based discipline unique goals, scope, and kinds of metrics.

Customer Relationship Management (CRM) is a customer-focused approach to meeting business goals. *Supply Chain Management* (SCM) focuses on product/service delivery sequences to meet business goals.

Business Process Management	This BPM discipline applies metrics to a single business process to maximize its contributions to overall business goals. The internal workings of the process are invisible, so the metrics are about things external to the "black box" – the product, customers, suppliers, inputs, events, etc.
Business Performance Management	This BPM approach applies similar metrics across multiple business processes to maximize goal-oriented performance across the enterprise. This version of BPM also employs metrics for products, customers, etc. but with an enterprise perspective. It recognizes dependencies among processes, and acknowledges that many processes may have overlapping suppliers, events, and inputs.
Business Activity Management	BAM applies metrics within a single business processes to optimize that process to best achieve business goals. Where BPM treats the process as a "black box," BAM looks inside the box. BAM metrics measure activities and the workforce that performs those activities.
Customer Relationship Management	CRM applies metrics to maximize customer value, enhance customer satisfaction, and increase customer retention. It focuses on measures of customers and business interactions with those customers – customer value, customer loyalty, customer satisfaction, customer behavior, etc.
Supply Chain Management	SCM applies metrics across multiple business processes to optimize the entire sequence of activities that supply a product or service to a customer. The sequence from materials ordering, through manufacturing, to product delivery involves a complex set of activities and dependencies among those activities. Metrics related to demand, materials, inventory, warehousing, resources, and delivery all have a role in SCM.

Module 3

BI & DW Architectures & Processes

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Warehousing Definitions

Data Warehousing Defined

A data warehouse is a subject-oriented, integrated, non-volatile, time-variant collection of data organized to support management needs.

W. H. Inmon, Database Newsletter, July/August 1992

I look at Information Warehousing as something that provides two real business benefits: data integration and data access. It removes much unnecessary and unwanted data and processing from the classic operational environment

Susan Osterfelt, Executive Systems Journal, January 1993

The process whereby organizations extract value from their information assets through the use of special stores called data warehouses

Ramon Barquin, Planning & Designing the Data Warehouse, 1997

The Data Warehouse is nothing more than the union of all the constituent data marts.

Ralph Kimball, et al, , The Data Warehouse Life Cycle Toolkit , 1998

A data warehouse is a data structure that is optimized for distribution. It collects and stores integrated sets of historical data from multiple operational systems and feeds them to one or more data marts. It may also provide end-user access to support enterprise views of data."

TDWI

Warehousing Definitions

Data Warehousing Defined

CONSENSUS DEFINITIONS

Multiple, and sometimes conflicting, definitions of data warehousing terms do exist (many of the differences to be discussed later in this course). Still, there is some consensus of definitions – or at least intent – among the varied definitions. Common themes are: integrated, subject-oriented, non-volatile, time-variant, accessible, meets business information needs and process of turning data into information.

INTEGRATED

Warehousing provides a single comprehensive source of information for and about the business. Answering a business question does not require accessing multiple sources, across a variety of technology platforms with potentially inconsistent data.

SUBJECT-ORIENTED

Data and information is organized & presented as business subjects aligned with information needs, not as computer files designed for transactional processing needs.

TIME-VARIANT

The warehouse contains a history of the business, as well as relatively current business information. Structures and intervals are kept consistent across time, allowing time specific analytics such as trend analysis.

NON-VOLATILE

The warehouse provides stable information. Business data, once written to the warehouse is not overwritten. The body of data grows through regular addition of new data in a way that maintains accurate historical records.

ACCESSIBLE

The primary purpose of a data warehouse is to provide readily accessible information to business people. The data is organized for easy access.

MEETS BUSINESS INFORMATION NEEDS

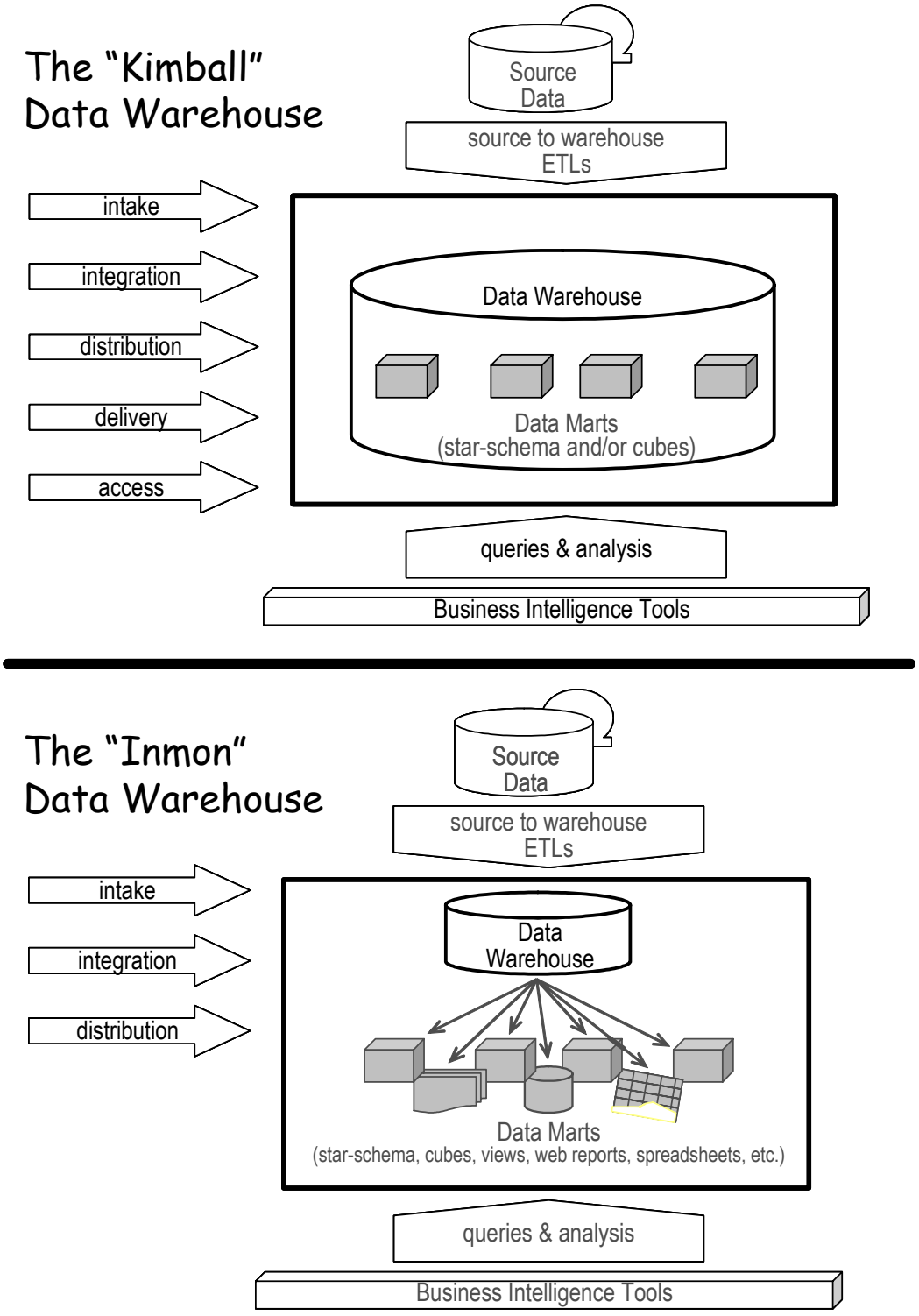
Warehousing provides an organized data resource, against which a variety of standard tools can be applied by business knowledge workers to manipulate, analyze and generate answers to business questions.

DATA-TO-INFORMATION PROCESS

David Loshin, in *Business Intelligence: The Savvy Manager's Guide*, describes data-to-information process as: "…the process of determining what data are to be collected and managed and in what context." Data is a collection of facts from which conclusions can be drawn. Through the process of interpretation by people or systems, data takes on meaning and becomes information. The warehouse is the primary source used specifically for analyzing business data and developing informational views of direct value to business people

Warehousing Data Stores

Data Warehouse



Warehousing Data Stores

Data Warehouse

CENTRAL DATA WAREHOUSE (HUB)

As previously discussed, Inmon defines a data warehouse "a subject-oriented, integrated, non-volatile, time-variant, collection of data organized to support management needs." (W. H. Inmon, Database Newsletter, July/August 1992) The intent of this definition is that the data warehouse serves as a single-source hub of integrated data upon which all downstream data stores are dependent. The Inmon data warehouse has roles of intake, integration, and distribution.

KIMBALL'S DEFINITION (BUS)

Kimball defines the warehouse as "nothing more than the union of all the constituent data marts." (Ralph Kimball, et. al, The Data Warehouse Life Cycle Toolkit, Wiley Computer Publishing, 1998) This definition contradicts the concept of the data warehouse as a single-source hub. The Kimball data warehouse assumes all data store roles – intake, integration, distribution, access, and delivery

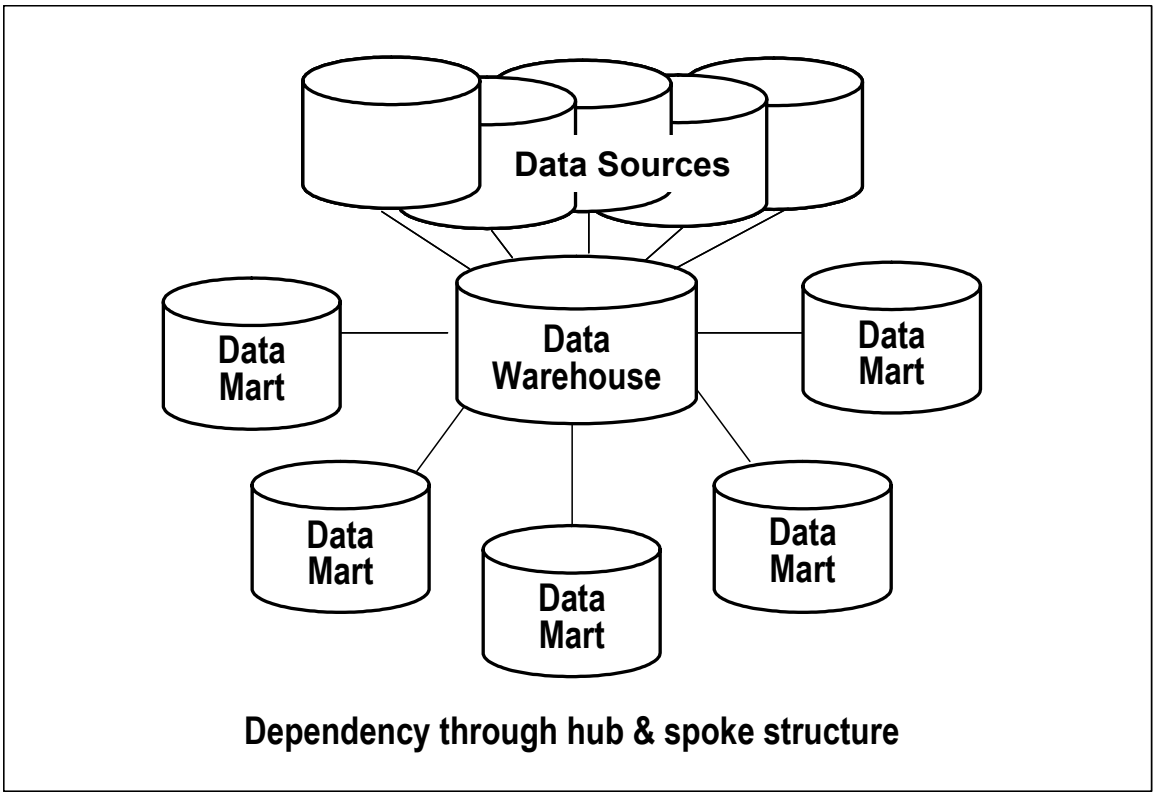
DIFFERENCES IN PRACTICE

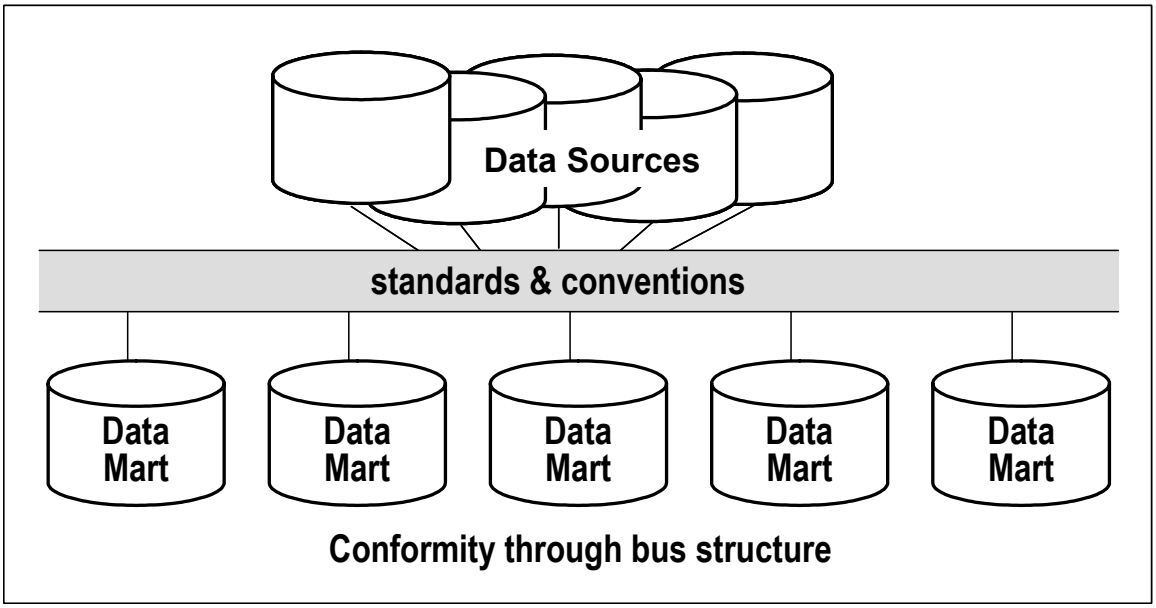
Given these two predominant definitions of the data warehouse - Inmon's (hub-and-spoke architecture) and Kimball's (bus architecture), what are the implications with regard to the five roles of a data store – intake, integration, distribution, access and delivery?

	Inmon Warehouse	Kimball Warehouse
intake	fills the intake role, but may be downstream from staging area	Fills the intake role – downstream from "backroom" transient staging
integration	Primary integrated data store with data at the atomic level	Integration through standards and conformity of data marts
distribution	Designed and optimized for distribution to data marts	Distribution is insignificant because data marts are a subset of the data warehouse
access	May provide limited data access to some "power" users	Specifically designed for business access and analysis
delivery	Not designed or intended for delivery	Supports delivery of information to the business

Data Warehousing Architectures

Hub vs. Bus Architecture





Data Warehousing Architectures

Hub vs. Bus Architecture

HUB & SPOKE ARCHITECTURE

The hub-and-spoke architecture provides a single integrated and consistent source of data from which data marts are populated. The warehouse structure is defined through enterprise modeling (top down methodology). The ETL processes acquire the data from the sources, transform the data in accordance with established *enterprise-wide* business rules, and load the hub data store (central data warehouse or PSA). The strength of this architecture is enforced integration of data.

Pros	Cons
Produces a flexible enterprise architecture	Requires considerable front end analysis – long start-up time
Retains detail data in relational form	Warehouse grows large quickly – high start-up costs and maintenance
Eliminates redundant extracts from operational data sources	Design to delivery time is too long
Integration is consistent and enforced across data marts	

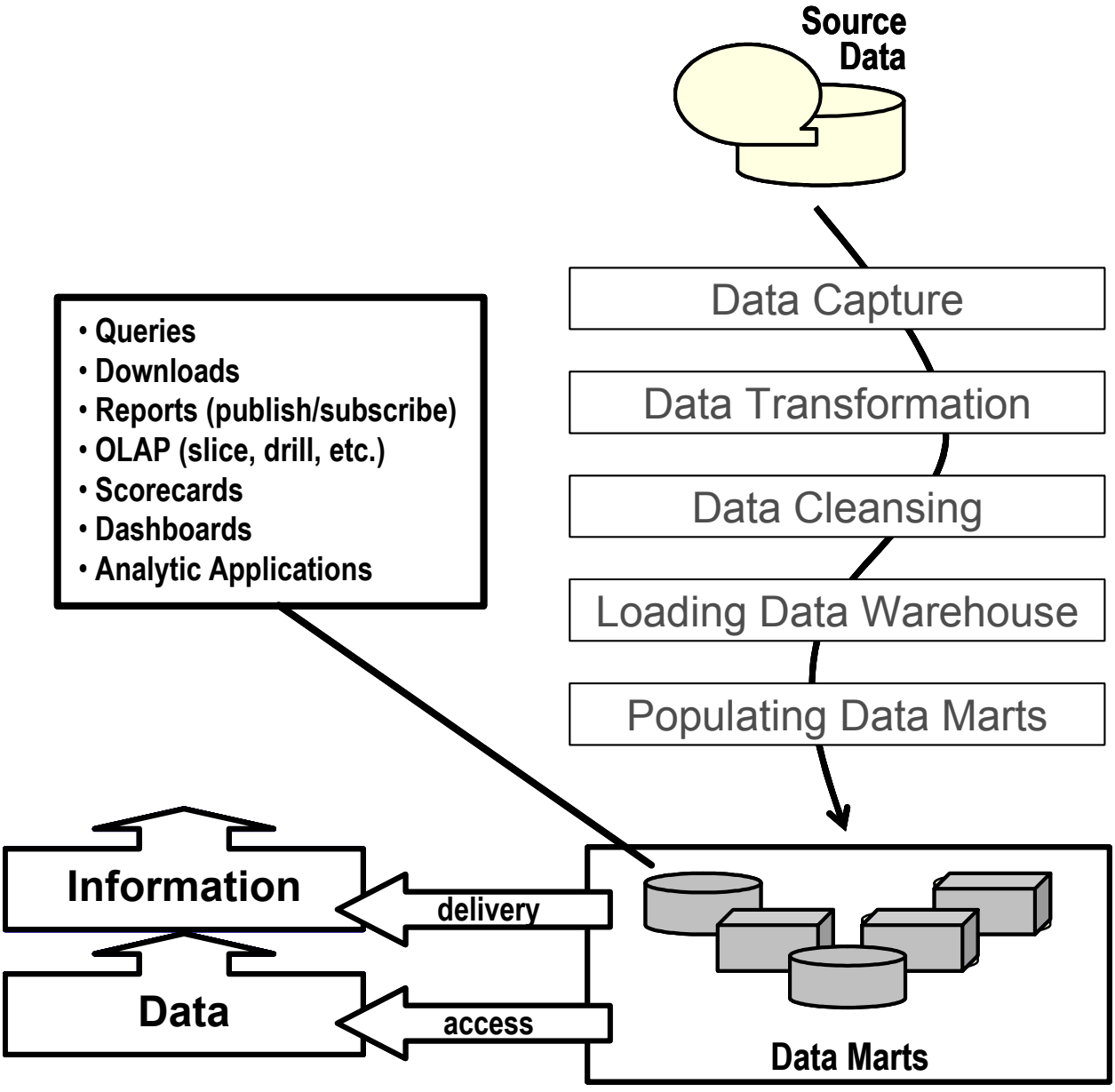
BUS ARCHITECTURE

The Bus Architecture relies on the development of conformed data marts populated directly from the operational sources or through a transient staging area. Data consistency from source-to-mart and mart-to-mart are achieved through applying conventions and standards (conformed facts and dimensions) as the data marts are populated. According to Kimball, the warehouse manager establishes, through a very short data architecture design phase, a focused and finite overall data architecture, which defines the scope of integration for the complete warehouse. The manager then oversees construction of each data mart. Over time, as enough data marts are developed "the promise of an integrated enterprise data warehouse" is realized. The strength of this architecture is consistency without the overhead of the central data warehouse.

Pros	Cons
Integration done where and when the business needs it	Higher risk of data inconsistency
Less up front modeling required	Standards don't have enterprise view
Start up costs are less	May have to rework existing data marts as operational sources change

Business Intelligence Processes

Data Access and Information Delivery



Business Intelligence Processes

Data Access and Information Delivery

DATA ACCESS PROCESSES

Data access processes are those activities performed by business people who want to receive data that they will analyze, interpret, or use locally and individually. These processes are usually performed by people who have some skill in working directly with data. They are generally not strategic processes, but tactical or operational in nature. Data access processes are supported by tools with ad hoc query, report generation, and data retrieval capabilities. A single data access process may use several of these features. For example, a process to send a customer survey:

- Perform an ad hoc query to determine the number of customers who meet particular selection criteria.
- Repeat queries while refining selection criteria until the number of customers matches the desired size of the survey population.
- Use a report generator to create and format a report of customers to receive the survey that includes name, address, etc.
- Use data retrieval features to download the report in a digital format.
- Merge the digital report with the survey to format and print personalized surveys to be mailed to each customer.

This example describes a *business* process. The purpose is to produce a survey – not simply to retrieve data. From determining the survey population to producing the survey document, the process is facilitated by data access capabilities.

INFORMATION DELIVERY PROCESSES

Information delivery processes differ from data access processes in two very significant ways: (1) They provide information – not just data; and (2) They are initiated by automated systems – not by individuals. Further, information delivery processes are likely to participate in strategic and tactical activities, where data access processes work in the range of tactical to operational. Information delivery technologies include:

- OLAP, which delivers metric information for interactive analytical,
- report publish & subscribe capabilities,
- dashboards and scorecards that present performance indicators, business metrics, alerts, trends, and forecasts in visual formats,
- analytic applications that package many information delivery capabilities for specific business purposes.

Information delivery processes enable business activities such as fraud detection, supply chain optimization, performance management, etc.

Module 4

BI Infrastructure

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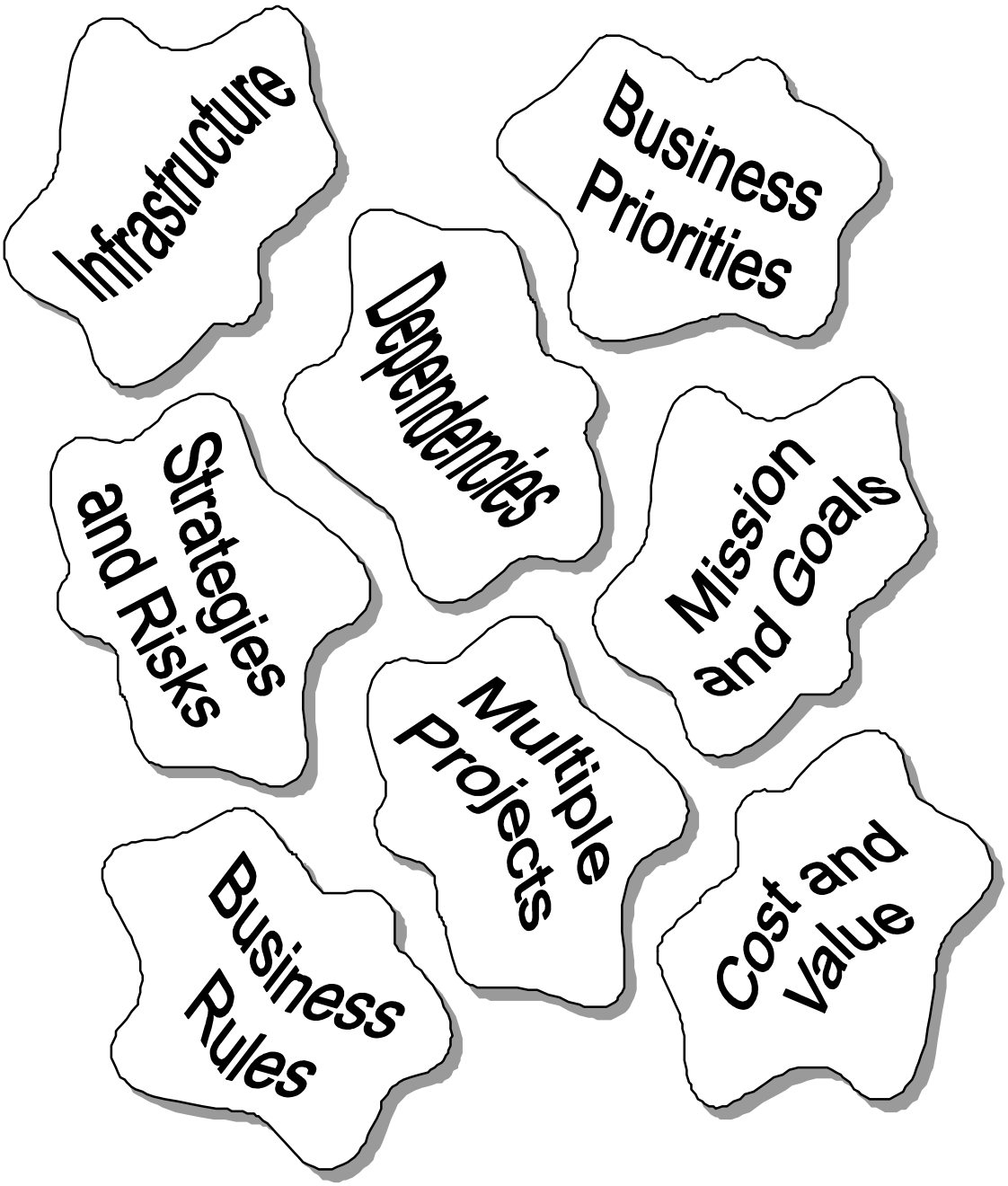
BI Processes

Program Management - Aligning Multiple Projects and Activities



BI Processes

Program Management - Aligning Multiple Projects and Activities

WHAT IS BI PROGRAM MANAGEMENT?

Program management encompasses the disciplines and activities necessary to coordinate multiple simultaneous, overlapping, and interdependent efforts. Program management addresses both project efforts such as building a data mart or deploying an analytic tool, and ongoing efforts such as data warehouse operations or training and support. A BI program includes a governance structure and guiding principles, delineated architecture and methodologies, established standards, quality expectations, and measures of cost and value. The program's primary focus is on the strategic, long-term goals – building an information infrastructure that will serve current business needs and evolve with the changing needs.

PROGRAM vs. PROJECT

A BI program is a large and complex undertaking with a broad strategic perspective and long-term focus. It is the structure that ensures cohesion among multiple projects. The program has long duration (for the life of BI within the enterprise) and measures success by business impact and ROI.

BI/DW projects are one-time, time boxed activities with a specific business and/or technical objectives. Projects have start and finish dates, and are chartered to produce explicit deliverables. Projects are relatively short in duration, and measure success by on-time, within-budget delivery of products.

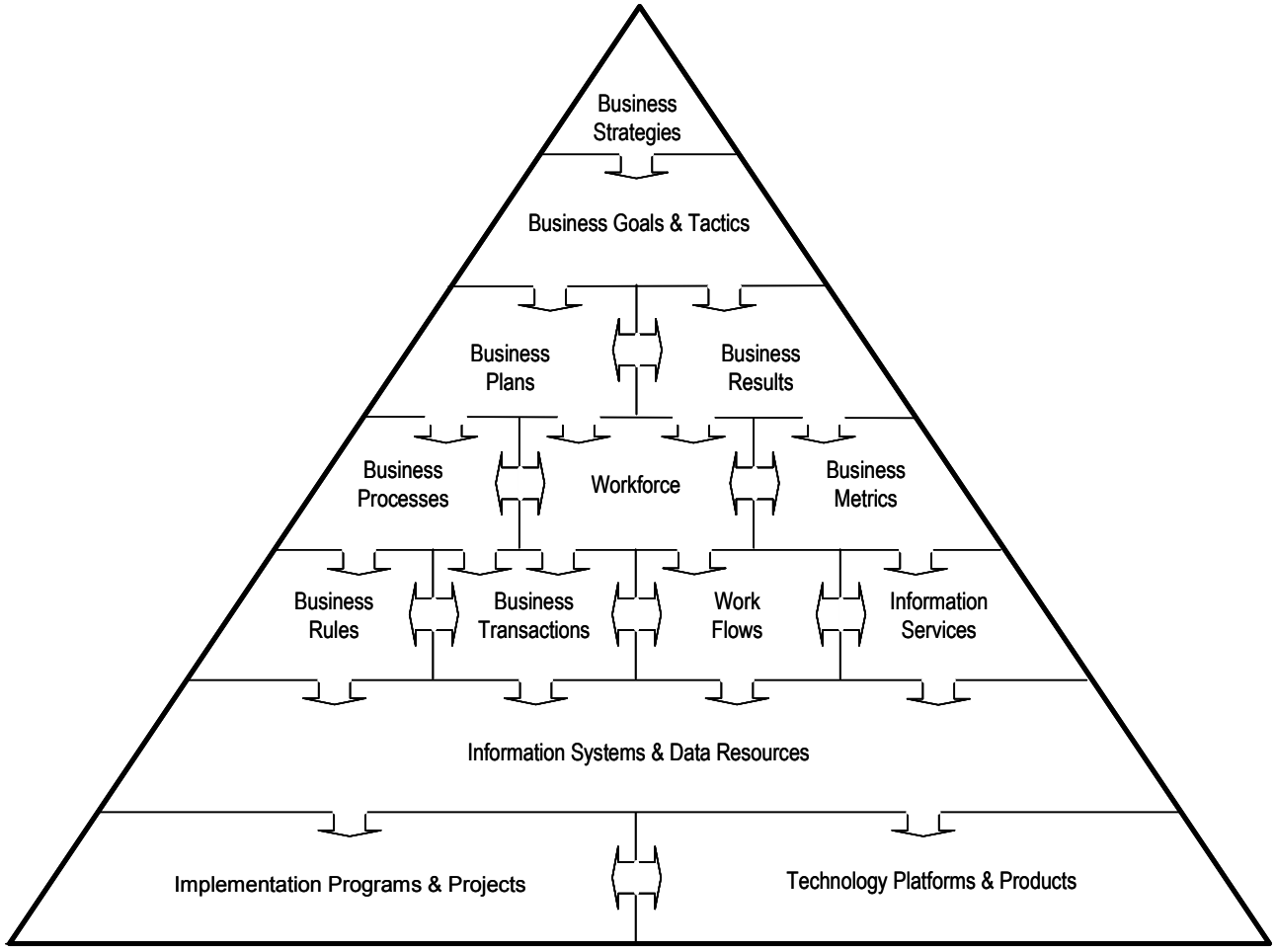
ALIGNING PEOPLE, PROJECTS, AND PRIORITIES

The key to successful program management is alignment of people, projects, and priorities to do the best possible job of fulfilling the program's mission, enabling business strategies and tactics, and creating business value. Program management must attend to each of:

Business Priorities	Aligned with business priorities and quickly adapting to changing priorities.
Mission & Goals	Program mission & goals are stated and designed to support business mission & goals.
Strategies & Risks	Risks are known and mitigated by active business participation & incremental projects.
Multiple Projects	BI is deployed through many small projects, each with specific, defined deliverables.
Dependencies	Relationships among projects, roles, and teams are known and actively managed.
Cost & Value	Cost and value are regularly measured and program ROI is published or communicated.
Business Rules	Business rules are captured, documented, & communicated. Rule changes are tracked.
Infrastructure	Scalable technical and non-technical infrastructure is actively managed and evolved.

BI Processes

Program Management - Business Alignment



BI Processes

Program Management - Business Alignment

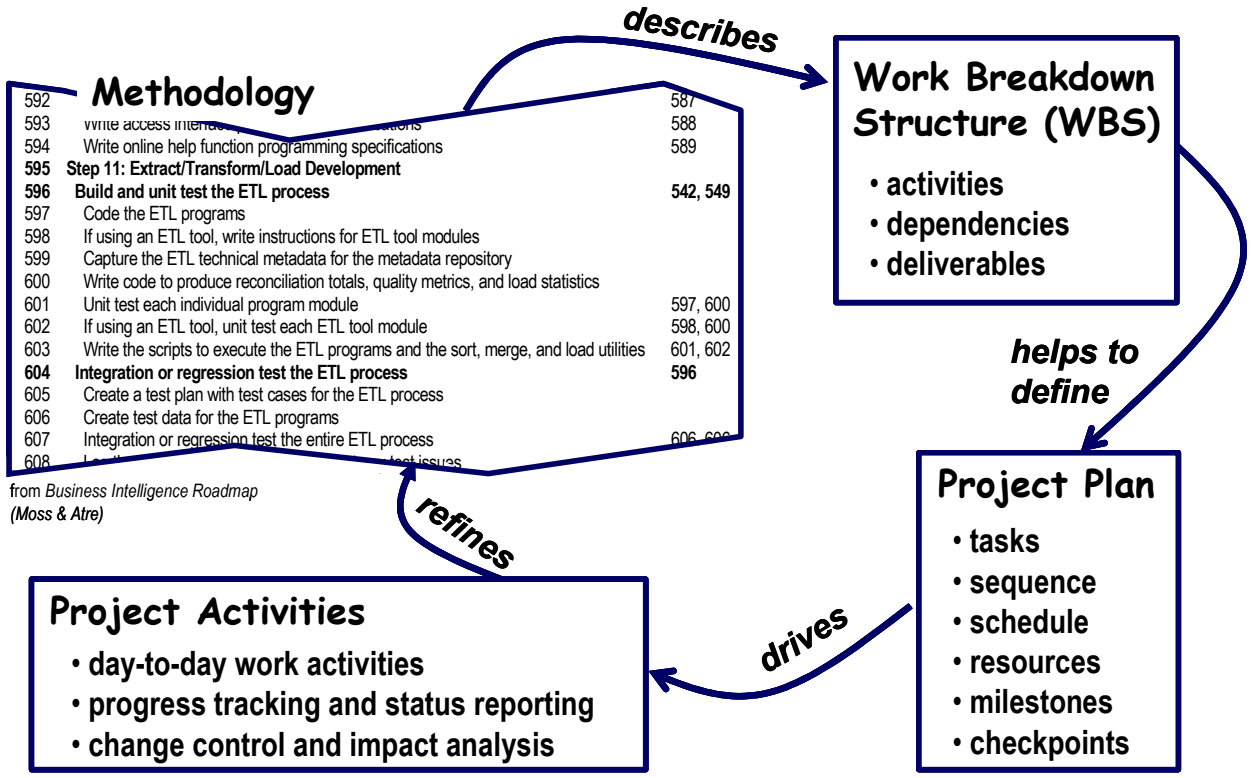
A BUSINESS FOUNDATION

Business alignment is perhaps the single most important responsibility of program management. As the goals and strategies of the business change, the BI program must adapt to new realities. The diagram on the facing page illustrates the large set of components that must be considered to manage a well-aligned BI program:

Business Strategies	Means of responding to drivers and influences of the business environment. These will change as business drivers change and as feedback drives changes in strategy.
Business Goals & Tactics	Measurable objectives of the business, and the actions intended to meet them. Changing goals lead to changing metrics. Changing tactics result in changed information needs.
Business Plans	Action plans for the business. Changing business plans affect business rules, processes, metrics, and information needs.
Business Results	Outcomes of business actions; the foundation for KPIs and business metrics. Results are at the core of much BI information, both historically and as forecasts. As business goals and plans change, business results of interest will also change.
Business Processes	Business processes are the focus of many BI initiatives – BPM, BAM, SCM, etc. Targeted business processes may change as goals and strategies change. Business processes may change, driving adjustments to BI products.
Workforce	Includes the knowledge-workers who will use BI products and information. As the workforce changes, information needs will change. Also, in some BI applications (BAM in particular) the workforce is the subject of some BI metrics.
Business Metrics	Performance indicators of the business. Useful metrics will are adjusted as change occurs to any of strategies, goals, tactics, plans, processes, and workforce.
Business Rules	Business rules describe the way that the business operates. Warehousing data structures, data integration approaches, and information services must all be compatible with business rules. Rule changes lead directly to BI product changes.
Business Transactions	Transactions are the interactions that the business has with other parties – customers, suppliers, partners, etc. Transactions are the source of much business data, and are the subject of many business metrics.
Workflows	Workflow is the sequence of activities performed by the workforce that begins with a need and ends with a result. Workflow has a very strong relationship to information sharing and emphasizes the demand for integration and consistency.
Information Services	The tools, technologies, and applications that provide information to the business.
Information Systems & Data Resources	Operational systems and their databases are the primary source of warehousing data, which in turn is the source of most business analytics and BI information. Systems changes affect BI significantly.
Implementation Programs & Projects	The BI program is an implementation program, influenced and affected by all of the items listed above. Alignment with, and response to change in all of these items is central to program management.
Technology Platforms & Products	Technology must be aligned with the program and its goals. New, evolving, and innovative technologies change business expectations and program goals.

BI Processes

Project Management - Project Management and Methodology



BI Processes

Project Management - Project Management and Methodology

USING METHODOLOGY

A well-defined methodology serves as a template to identify and organize tasks and deliverables as a project plan. Tasks define the work breakdown structure (WBS) for the project. Significant deliverables are the basis of project milestones. The project manager must refine methodology-generic tasks into project-specific tasks, add project-unique tasks, eliminate unnecessary tasks, and replicate tasks where multiple deliverables are required.

USING THE PROJECT PLAN

The project plan, not the methodology, guides project execution. A well-developed project plan:

- Provides a list of tasks to be performed,
- Identifies task sequences & dependencies,
- Identifies the scheduled start and end date each task,
- Identifies resource requirements,
- Assigns task responsibilities,
- Describes the deliverables associated with each task or set of tasks,
- Identifies milestone and checkpoints where project progress is measured – key decision points in the project,
- Describes the overall goals of the project and the expectations of business value to be realized,
- Identifies potential risks and risk-mitigation plans,
- Organizes tasks, deliverables, milestones, and resource requirements into a WBS
- Provides a sound basis for project tracking and reporting.

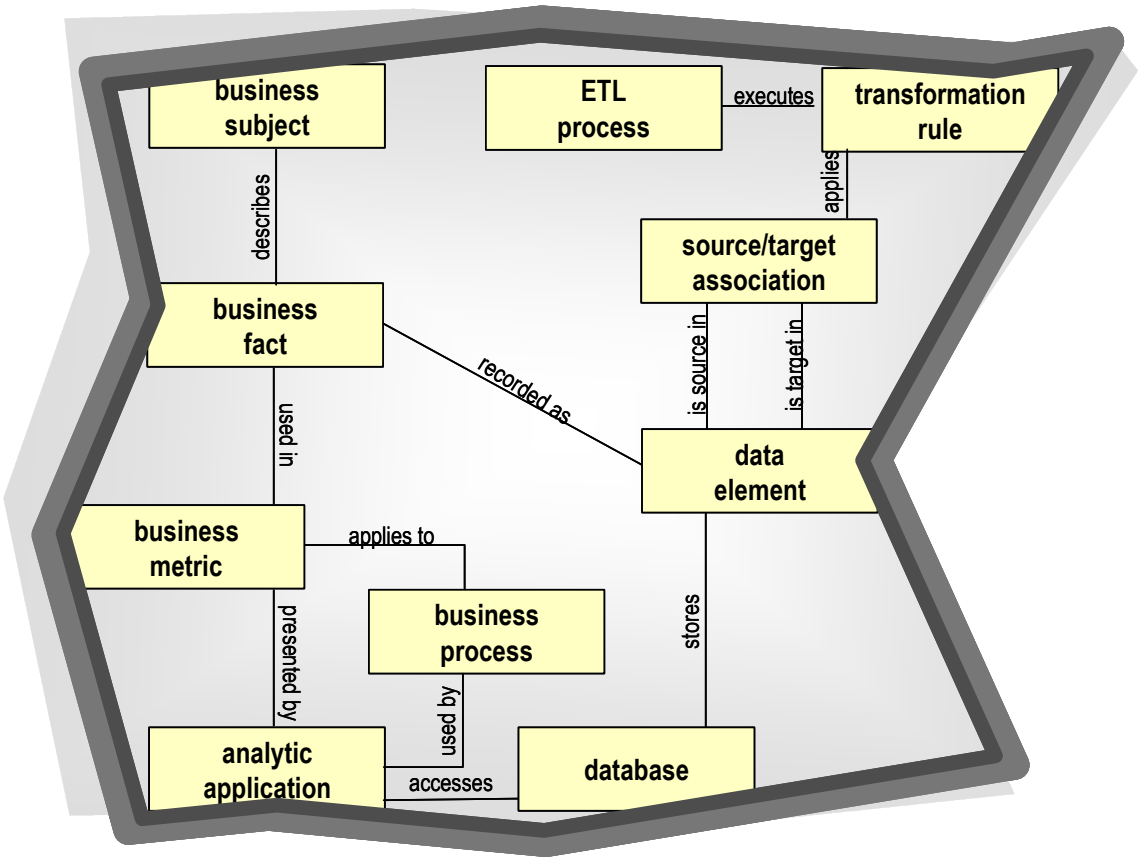
A general rule of thumb for successful projects recommends that tasks larger than 40 hours be subdivided into lower-level tasks. Remember that a project plan is only a plan – a prospective scheme of what you intend to accomplish and how you envision it to be done. Project plans are dynamic and will change as you progress.

REFINING METHODOLOGY

The best methodologies are those that adapt to the organizations that use them. A project review upon completion helps to identify deviations from and adjustments to the project plan. Adapting the methodology based on these factors helps it to become a more useful template for planning of future projects.

BI Processes

Metadata Management – Metadata Challenges



Determining Metadata Requirements

Collecting and Recording Metadata

Integrating Metadata

Maintaining and Updating Metadata

Providing Metadata Access

BI Processes

Metadata Management – Metadata Challenges

METADATA REQUIREMENTS

Understanding metadata requirements is fundamental to formulating a metadata strategy. Requirements need to consider (1) Why metadata is needed, (2) How much and which metadata is needed, and (3) How much metadata integration is necessary.

The successful metadata program identifies essential metadata based upon business needs, selects a manageable initial scope (& cost) with clearly identified business benefits and then incrementally rolls out metadata capabilities and achieves associated benefits.

METADATA COLLECTION

Gathering all of the metadata is a difficult activity. Identifying the sources and capture points is challenging enough. Once they are known, the metadata collection tasks may be labor intensive. These tasks include

- Collect & store technical metadata about warehousing data.
- Build process metadata capture capabilities into ETL.
- Author business metadata about warehousing data.
- Find and/or create business & technical metadata about sources.

METADATA INTEGRATION

Multiple tools capture different and sometimes overlapping metadata. Integration involves identifying all the tools, applications, and processes that capture metadata; knowing what metadata they capture; and determining how (in a sustainable and cost effective manner) to realize integration across those components.

METADATA MAINTENANCE

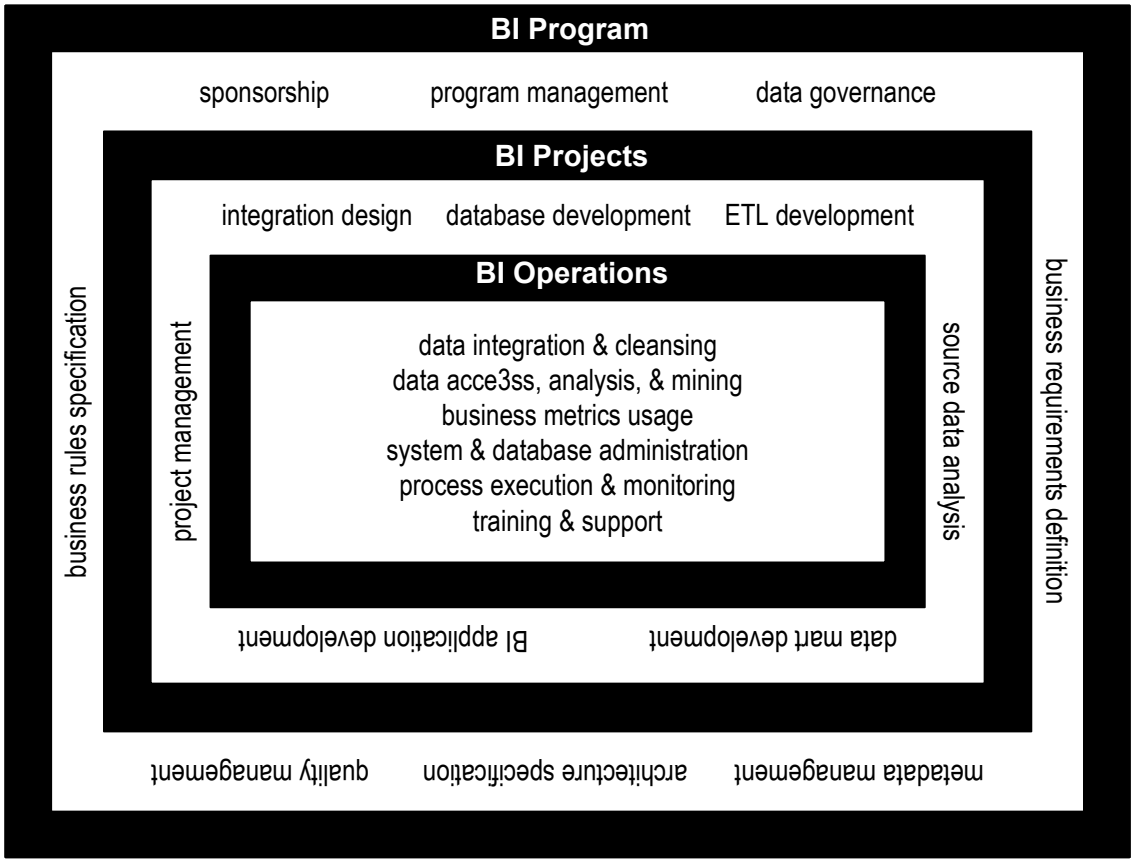
Keeping metadata complete and current is a continuous and resource intensive effort. The volume of metadata will increase as business users discover new ways to use information and new business questions are asked. Careful attention to standard processes and effective application of available tools will help keep the job manageable.

METADATA ACCESS

Metadata access for the business is ideally integrated into the analytic tools being used. Metadata provides context for information, and is most effective in doing so when metadata access is seamless. Providing access for all metadata users – business and technical – is challenged when metadata storage is not integrated but an integrated access facility is desirable.

BI Roles and Responsibilities

Who Does the Work?



Sponsor
Business Subject Expert
Knowledge Worker
Data Owner
Data Steward
Program Manager
Project Manager
Information Architect
Acquisition Architect
Technical Architect
Business Requirements Analyst
Source Data Analyst
ETL Developer
Database Developer
Front-end/OLAP Developer
Technology Specialist
Systems Administrator
Database Administrator
Metadata Administrator
Quality Administrator
Customer Service & Support Specialist
Trainer

BI Roles & Responsibilities

Who Does the Work?

BUSINESS ROLES Business roles are business unit responsibilities that should clearly not be assumed by or delegated to an IT organization. Simply understanding the needs and processes of the business is not sufficient qualification to fill these roles. They're about ownership. They demand a "stake in the game." Thus, even an exceptionally business-savvy IT person is likely to be under-qualified for the job. Business roles include:

Sponsor	Sponsors establish the charter and high-level goals, acquire funding, provide political will, and secure resources for BI/DW programs and projects. Sponsors also have responsibility as the ultimate resolution place for issues and conflicts. Program sponsors have interest in program, project, and operation kinds of work, and direct responsibility for program-level work. Project sponsors have responsibilities associated with the specific projects that they sponsor, and have interest in the operation and support implications of those projects. Effective sponsors are in a position to have influence across the entire scope of business to be affected by the programs and projects that they sponsor.
Business Subject Expert	Subject experts are responsible to provide topic knowledge to a project within a specific domain. This is a project role, and is the primary way that projects acquire business knowledge. Expertise about business data, rules, processes, organizations, systems, and needs are all subject expert responsibilities. Subject experts need to have good conceptual knowledge of their subject domain and sound practical experience working within that domain. They also need the skills to communicate their knowledge to other project team members.
End User	End users are responsible to get value from information resources. This is an operational responsibility to understand BI/DW concepts and environment, understand the kinds of information available, access information and apply it to achieve business impact. To fulfill these responsibilities, it is necessary to acquire knowledge of and skill using data access and analytic tools. The end user is expected to make effective use of data, information, and analytic services, and to provide feedback on issues such as data quality, data completeness, range of services, tool functionality, performance, and usability.
Data Owner	Data owners have responsibility and authority to make decisions about access, distribution and retention of data. They understand the business, the data, and the regulations, laws and policies governing data privacy. BI/DW data must conform to all relevant business and legal constraints and the data owner must work with the program to ensure proper governance is applied through all phases – capture, transport, storage and distribution. The ultimate owner responsibility is to secure maximum business value from data assets.
Data Steward	Data stewards are responsible to oversee continuous improvement of information quality at all three areas of BI/DW work – program, operation and support. Stewards foster consensus about data definitions, data quality, data usage and data reusability. They make recommendations about access, security, distribution and retention. Data stewards work with data owners and custodians to achieve high-quality, reliable, and secure data and information resources.

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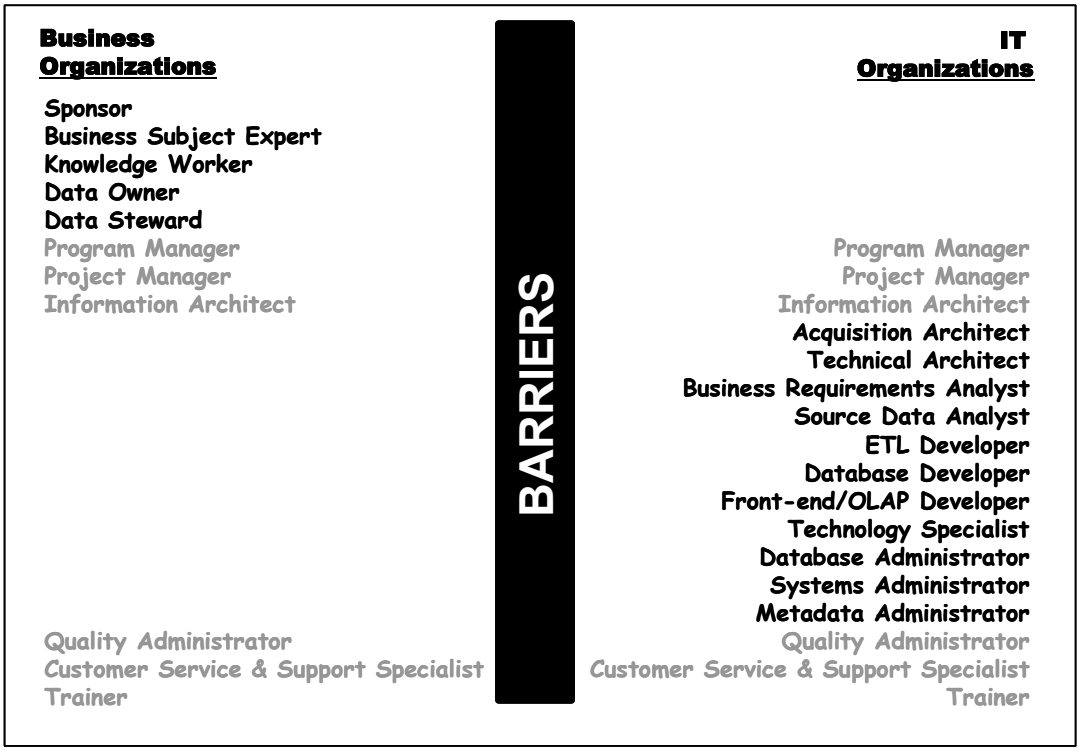
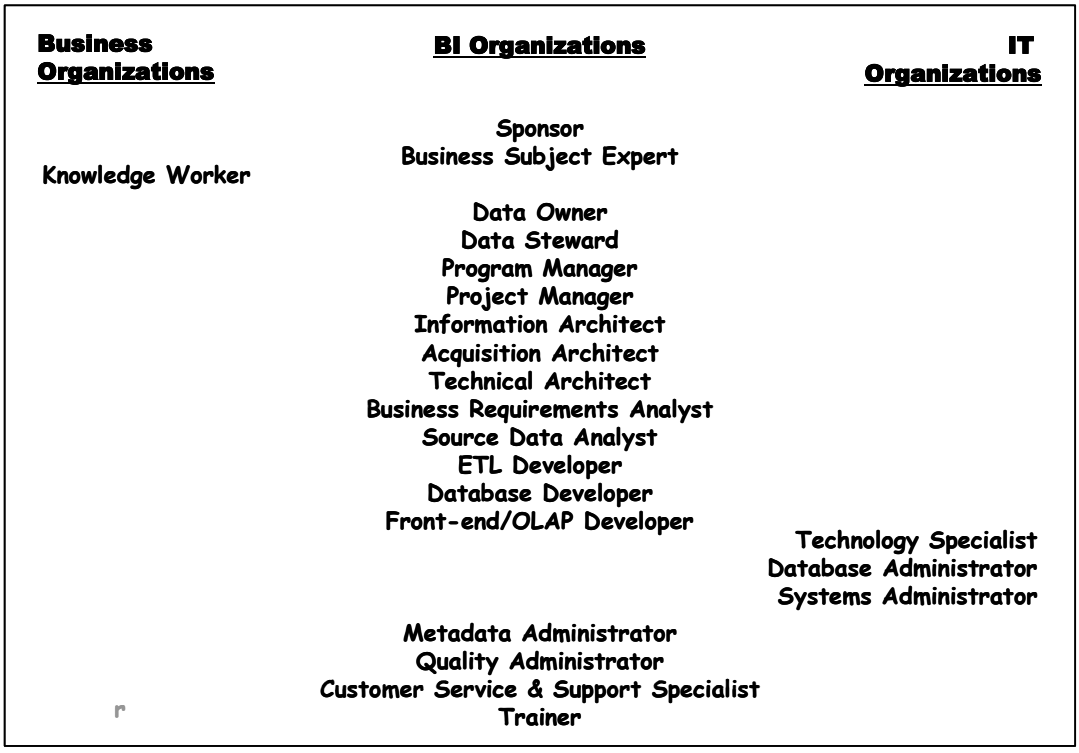
BI Roles and Responsibilities

BI Organizations





BI Roles & Responsibilities

BI Organizations

TRADITIONAL ORGANIZATIONS

Traditional organization structures for information technology initiatives divide roles between those held by IT organizations and those held by business organization. With two distinctly different types of organizations needing to work together for success, a set of business rules formally or informally describe the working relationships. Common models for the business relationships include contracts, partnerships, and collaboration. Each is summarized in the chart below with respect to six universal building blocks of working relationships.

	CONTRACT	PARTNERSHIP	COLLABORATION
FOCUS	Process-centric	Organization-centric	People-centric
BUY-IN	Negotiation	Consensus	Trust & commitment
CONTINUITY	Document and sign	Discuss and document	Strong leadership
CULTURE	Us-and-them	Defined roles and responsibilities	Key individuals
CHANGE	Limited responsiveness	Adjust the agreement	Adapt as needed
TEAMWORK	Inhibited	Facilitated	Demanded

THE BI ORGANIZATION

The BI organization is a new kind of organization that recognizes the barriers inherent in contract, partnership, and collaboration structures. It removes the organizational separation of business and IT for those engaged in business intelligence work, creating an organization where business knowledge and technical knowledge are contained within the same business unit and frequently within the same individuals. The BI organization assumes most BI roles. The BI organization has the following characteristics relative to working relationships:

FOCUS	BI-centric (business intelligence is the mission of the organization)
BUY-IN	Managed program (goals and measures are defined at the program level)
CONTINUITY	Strategic organization (business intelligence is an integral business activity)
CULTURE	Ownership (the organization is fully responsible for BI effectiveness and value)
CHANGE	Manages change (change management practices are employed)
TEAMWORK	Cohesive teamwork (without organizational boundaries and conflicts)

Module 5

Summary and Conclusions

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BI/DW Best Practices

Positioning for Success

Successful BI/DW Programs will:

1. **Attend to Strategic Positioning**
2. **Measure Results**
3. **Make it a Business Initiative**
4. **Practice "user first" Design**
5. **Create New Value**
6. **Attend to Human Impacts**
7. **Focus on Information and Analytics**
8. **Practice Active Data Stewardship**
9. **Manage BI as a Long-Term Investment**
10. **Reach Out with BI/DW Solutions**

BI/DW Best Practices

Positioning for Success

BEST PRACTICES IN BI & DW

The list of best practices on the facing page is adapted from an article TDWI's *FlashPoint* e-newsletter of April 10, 2003. Each practice is briefly described below. A reprint of the entire article is reprinted in *Appendix A*. *FlashPoint* is distributed regularly to TDWI members. Each issue contains thought-provoking articles from leading BI/DW consultants and practitioners.

Strategic Positioning	BI success begins with clear understanding of the reasons that BI is important to your business. Knowledge of both business drivers and BI program drivers defines the strategic and tactical positioning of a BI program.
Measured Results	Applied analytics succeed in organizations that use metrics effectively. When you acknowledge the BI/DW program as both a business process and an investment, it becomes an obvious target of applied metrics. Establish measurable goals and define actionable metrics for the program.
Business Initiative	Successful BI engages the business. It is a "business first, technology second" endeavor. Technology can support BI, but it can't create BI. Technology organizations can deploy BI solutions, but they can't create BI cultures.
"User First" Design	BI/DW products only deliver value when they are used by people conducting business activities. Design first for the user experience. Start with what the user will see and how they will interact with BI products. Give particular attention to how BI solutions will fit seamlessly into day-to-day business activities.
New Value	BI programs are costly initiatives, justified solely by the business value that they return. Sufficient value isn't likely to be obtained simply through new ways to deliver old information. Seek opportunities for and strive to deliver value-added information. Don't just integrate data – enrich information.
Human Impacts	BI success and effectiveness depends on people. From those who define and articulate business strategies to those who employ BI products in their day-to-day work, BI changes jobs. It creates new roles and responsibilities, demands new skills, and changes the way that work is done. Business professionals and seasoned IT people will both experience significant change.
Information & Analytics	Information is more valuable than data. Data is only the raw material that is used to create information. Position data warehousing as the supply chain for business information, and DW technology as "under the hood" stuff that is necessary to power business intelligence.
Active Data Stewardship	If data is the raw material from which we create information; then reliability of information directly depends on the quality of the data that is used to produce it. Good information depends on good data; and good data is a product of good data management, not of good fortune. One of the keys to BI success is business-managed data & information resources, implemented through active and ongoing data stewardship.
Long Term Investment	Strive for lasting value from the BI program. While quick-strike successes create political goodwill and heroes-for-a-day, a sustainable BI program is one that continuously provides meaningful information, useful analytics, and measurable impact.
Reach Out	Extend the reach of BI as far as practical. Each business process touched by BI is a potential opportunity to receive value, as is each person who uses the BI products.