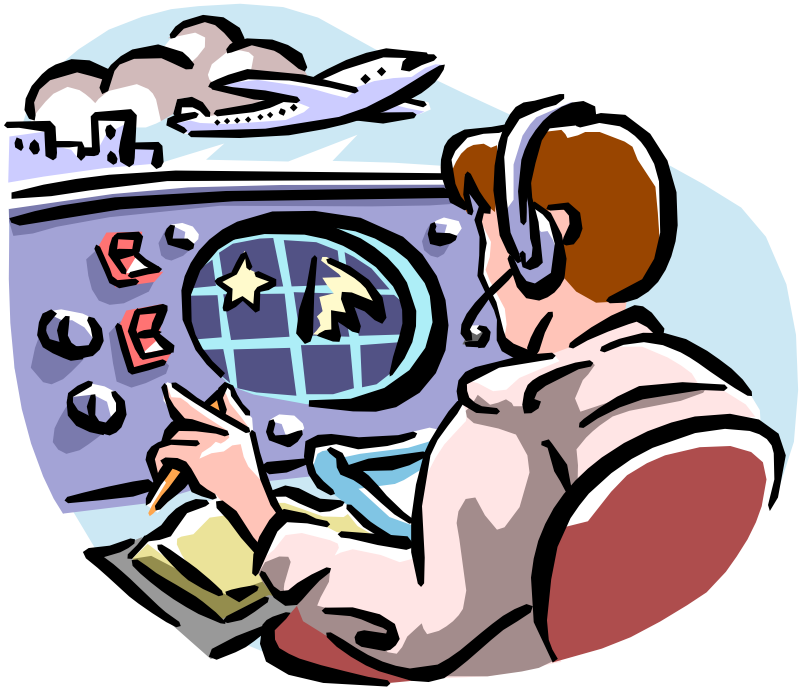
Business Intelligence Project

Business Intelligence

Definition:

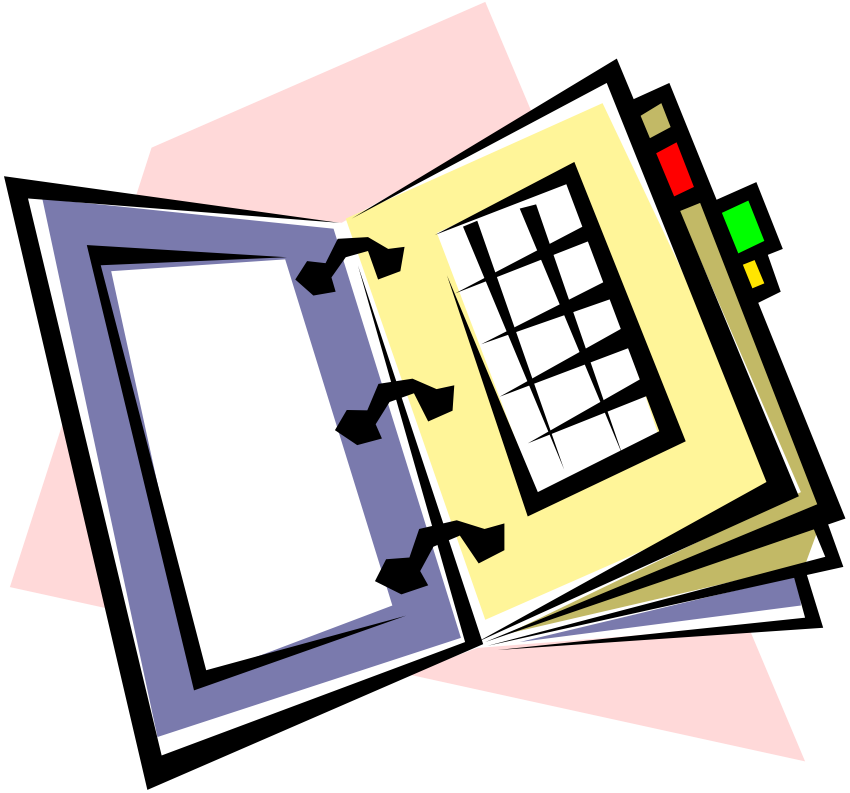
“Analysis of business data. Business Intelligence is the name given to a class of software tools specifically designed to aid analysis of business data. BI tools have traditionally been associated with in-depth analysis of historical transaction data, supplied by either a data warehouse or an online analytical processing (OLAP) server linked to a database system. BI has a wide range of commercial and non-commercial applications, with the most common being the analysis of patterns such as sales and stock trends, pricing and customer behavior to inform business decision-making. For this reason it is sometimes referred to as decision support software.”

Introducing Business Intelligence



BI focuses on the “outside,” and should be seen as a company’s *radar* unit, scanning the external environment for opportunities and dangers.

It's *not* just another term for Market Research….



Good BI is broader in scope and more forward-looking than market research.

Fundamentals

“Business Intelligence initiatives are expensive endeavors. Disparate business data must be extracted and merged from online transaction processing (OLTP) systems, from batch systems and from external data sources. Business Intelligence decisions – support initiatives also call for new technology, additional tasks to be performed, roles and responsibilities to be shifted, and analysis and decision-support applications to be delivered quickly while maintaining acceptable quality.”

Fundamentals

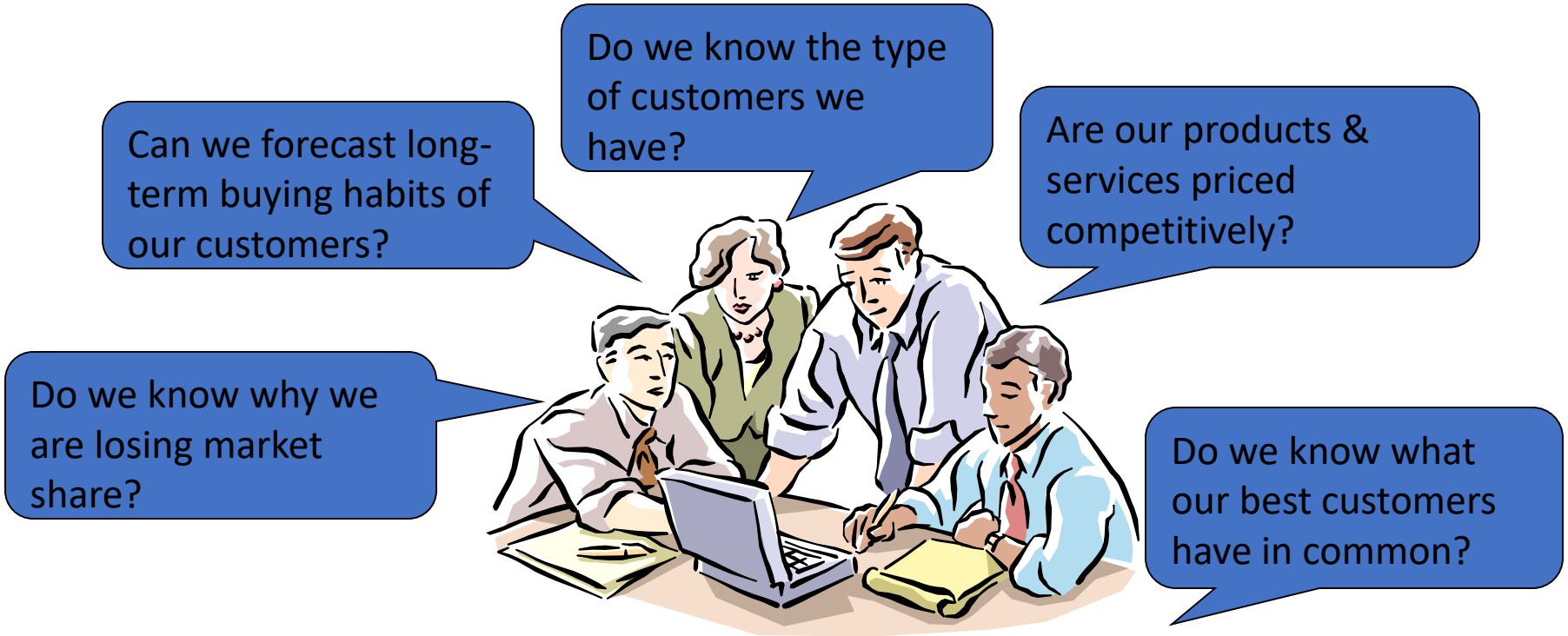
“Sixty percent of Business Intelligence projects end in abandonment or failure because of inadequate planning, missed tasks, missed deadlines, poor project management, undelivered business requirements, or poor quality of the deliverables.”

“*Failure to Plan is a Plan for Failure”*

Fundamentals

- Unlike static stand-alone applications, a properly designed BI system cannot be built in "*one big bang*"
- Data and functional capabilities must be rolled out in iterative releases
- BI applications are very different from stand-alone applications

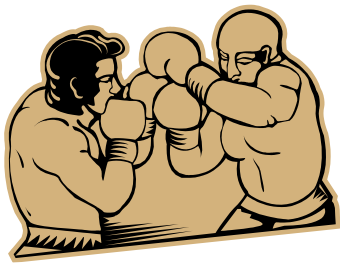
Fundamentals



Fundamentals

- **Business Intelligence vs. Standard Application**

- Business *opportunity*
- Implement across the organization
- *Strategic* Information requirements
- Best deployed as release/evaluate environment



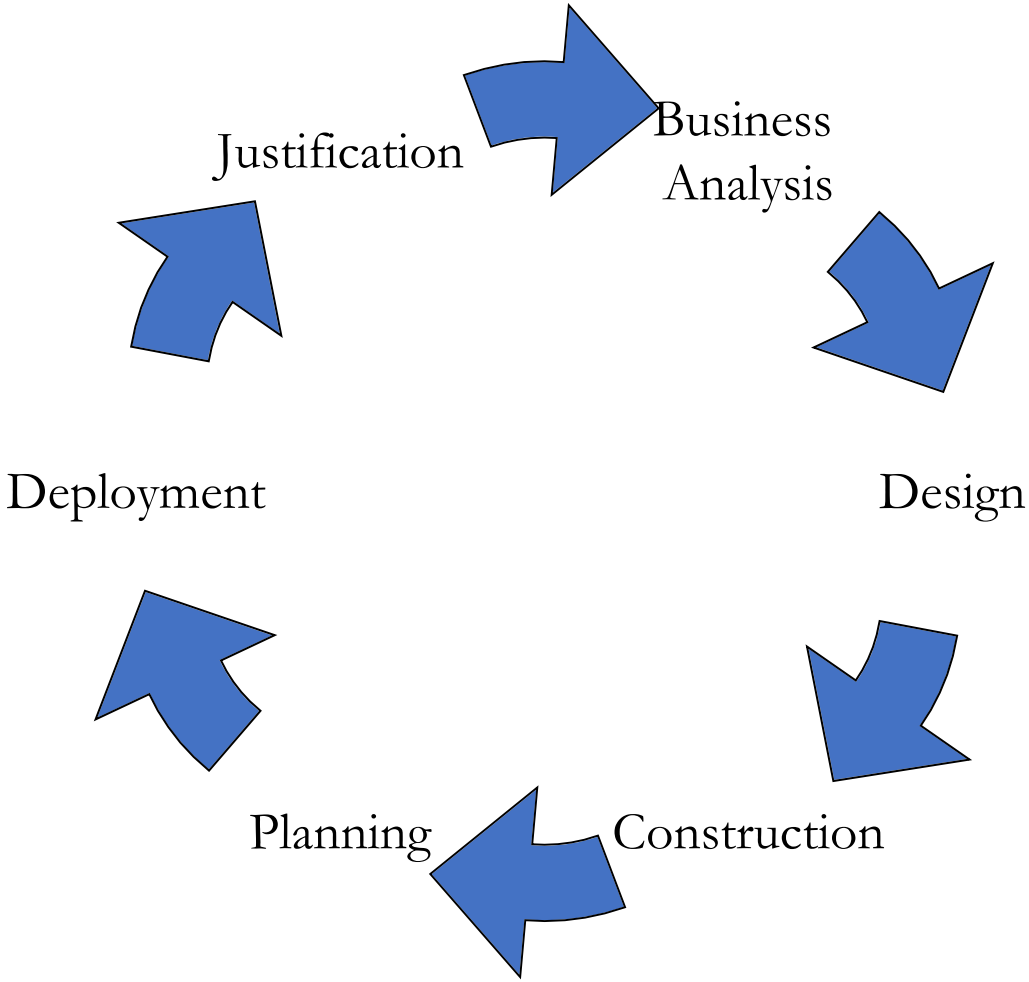
- Business needs
- Department decision support
- Operational functional requirements
- Best released at the same time with all functional capabilities

Fundamentals

- BI requires a Cross-organizational development approach
  - Information consolidation
  - Seamless business functionality
  - Information integration
  - Streamlined organizational business processes
  - Information integrity
  - Organization changes
  - Corporate culture shifts
  - Parallel development tracks (subprojects)

Fundamentals

Business Intelligence Project Lifecycle:



Outline (Sixteen Steps)

Justification

1. Business case assessment

Planning

2. Enterprise Infrastructure Evaluation
3. Project Planning

Business Analysis

4. Project Requirements Document
5. Data Analysis
6. Application Prototyping
7. Meta Data Repository Analysis

Note: ETL - Extract/Transform/Load

Design

8. Database Design
9. ETL Design
10. Meta Data Repository Design

Construction

11. ETL Development
12. Application Development
13. Data Analysis
14. Meta Data Repository Development

Deployment

15. Implementation
16. Release Evaluation

Presentation Notes

- Handouts
- Two slides with
  - Activities (do) – end of each step
  - Deliverables (produce) – end of each section/stage

Stage One

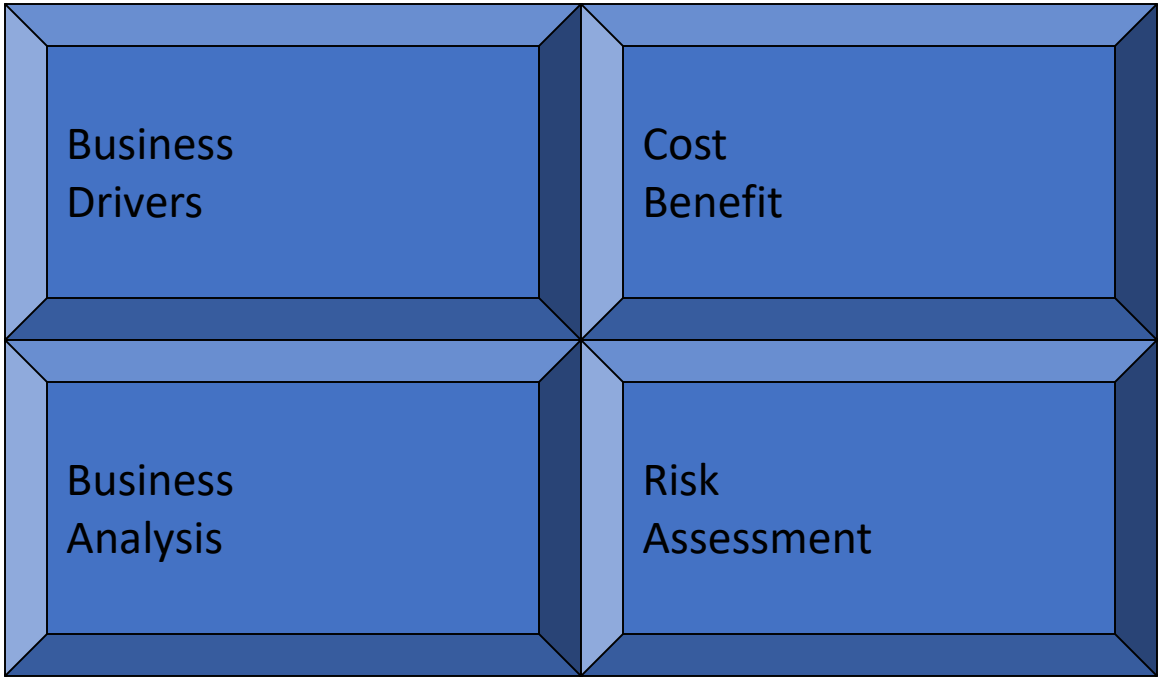
Justification

Stage One: Justification

(1) Business case assessment

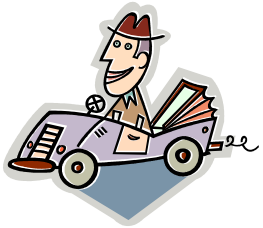
- The business problem or business opportunity is defined
- Cost-justified
- Define the benefit
- Solving a business problem or taking advantage of a business opportunity
- Balance between the costs involved and the benefits gained
- Must be business driven not technology driven

Business Justification Components



Business Drivers

- Strategic business goals of the organization
- Substantiate business justification i.e.
  - Customer satisfaction
  - Reduced costs
  - Critical business data available
- Must be in line with the company's business direction



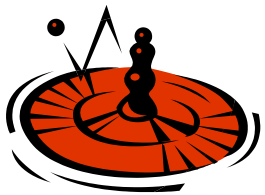
Business Analysis

- What business issues will be resolved?
- Define information requirements for the business issue
- Determine subject area, level of detail, internal data and external data needed
- Identify the user community
- Possible data sources
  - Online Transaction Processing (OLTP)
  - Private data (internal department data)
  - External data (i.e. statistics, customer profiles, credit reports, etc.

Cost Benefit

- Warning: ROI can be difficult to cost justify
- Remember do not justify by solving operational problems
- How are you solving a business problem?
- What new business opportunities will be available?

Risk Assessment

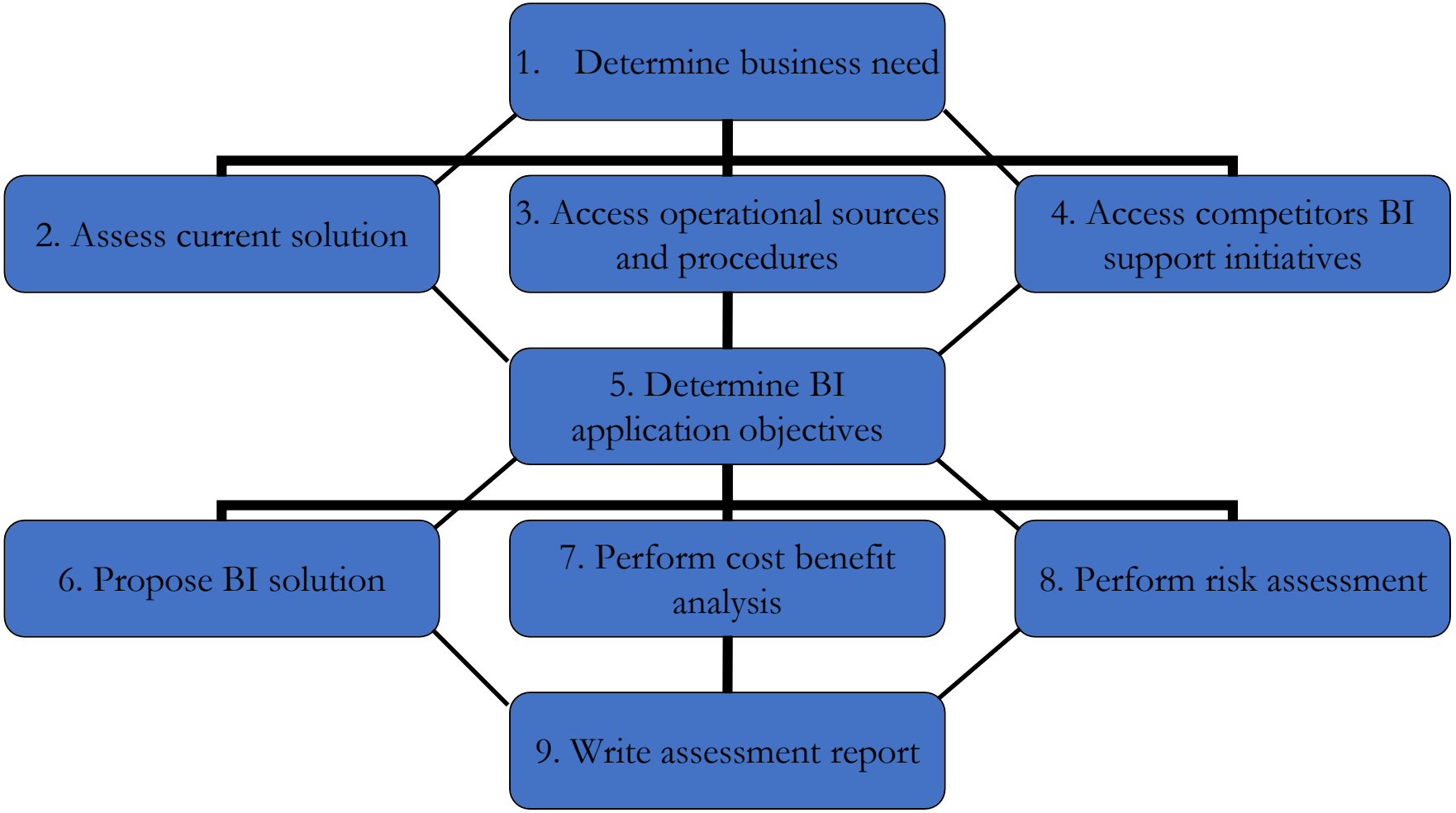


- All projects have risk
- Identifying risk triggers
- Create a mitigation plan for all important risks
- Create a contingence plan for all important risks

Risk Assessment

Variable	Low	Medium	High
Technology	Experienced with technology	Minimal experience with technology	New technology little experience
Complexity	Simple, minimal workflow impact	Moderate, some workflow impact	Mission critical, requires extensive work
Integration	Stand-alone	Limited integration	Extensive integration
Organization	Solid internal support	Supportive to a large extent	Little internal support
Project Team	Business experience, talented, great attitude	Some business experience, talented, fair attitude	No business experience, only technology-driven, bad attitude
Financial Investment	ROI in short time	ROI within a moderate time frame	ROI after a few years

Business Case Justification Activities



Justification Deliverable

Business case assessment report

- Strategic business goals
- Objectives of the proposed BI application
- Statement of the business need
- Explain how the BI application will satisfy the business need
- Ramifications of *not* addressing the business need
- Cost-benefit analysis
- Risk assessment
- Recommendations

Note: Remember to include an executive overview

Stage Two

Planning

Stage Two: Planning

(2) Enterprise infrastructure to support the cross-organization initiatives

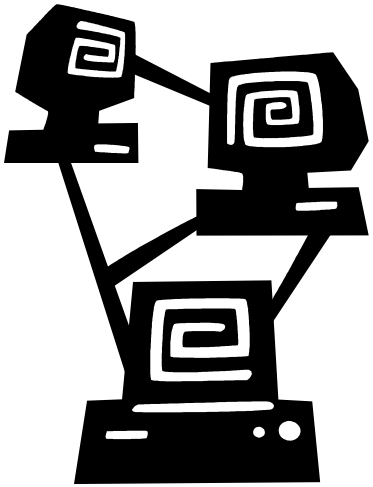
- Technical infrastructure
- Non-Technical infrastructure

(3) Project Planning

- Including scope, time, budget, staff, technology, business representatives and sponsors
- Include in the plan must be detailed plans to track and report progress

Planning the Technical Infrastructure

- Description of the current structure
- Plan the future structure (changes)
- Middleware to the DBMS
- DBMS requirements



Middleware Platform

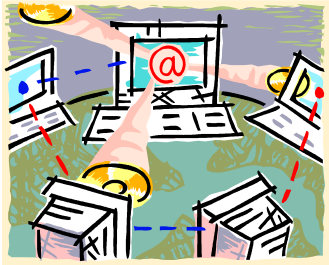
- Middleware – Runtime software
- Client/Server Architecture
- Middleware categories
  - Distributed Logic Middleware: supports program-to-program communications between two pieces of custom application code
  - Data Management Middleware: connects an application or DBMS on one platform with a DBMS running on another platform

DBMS Platform

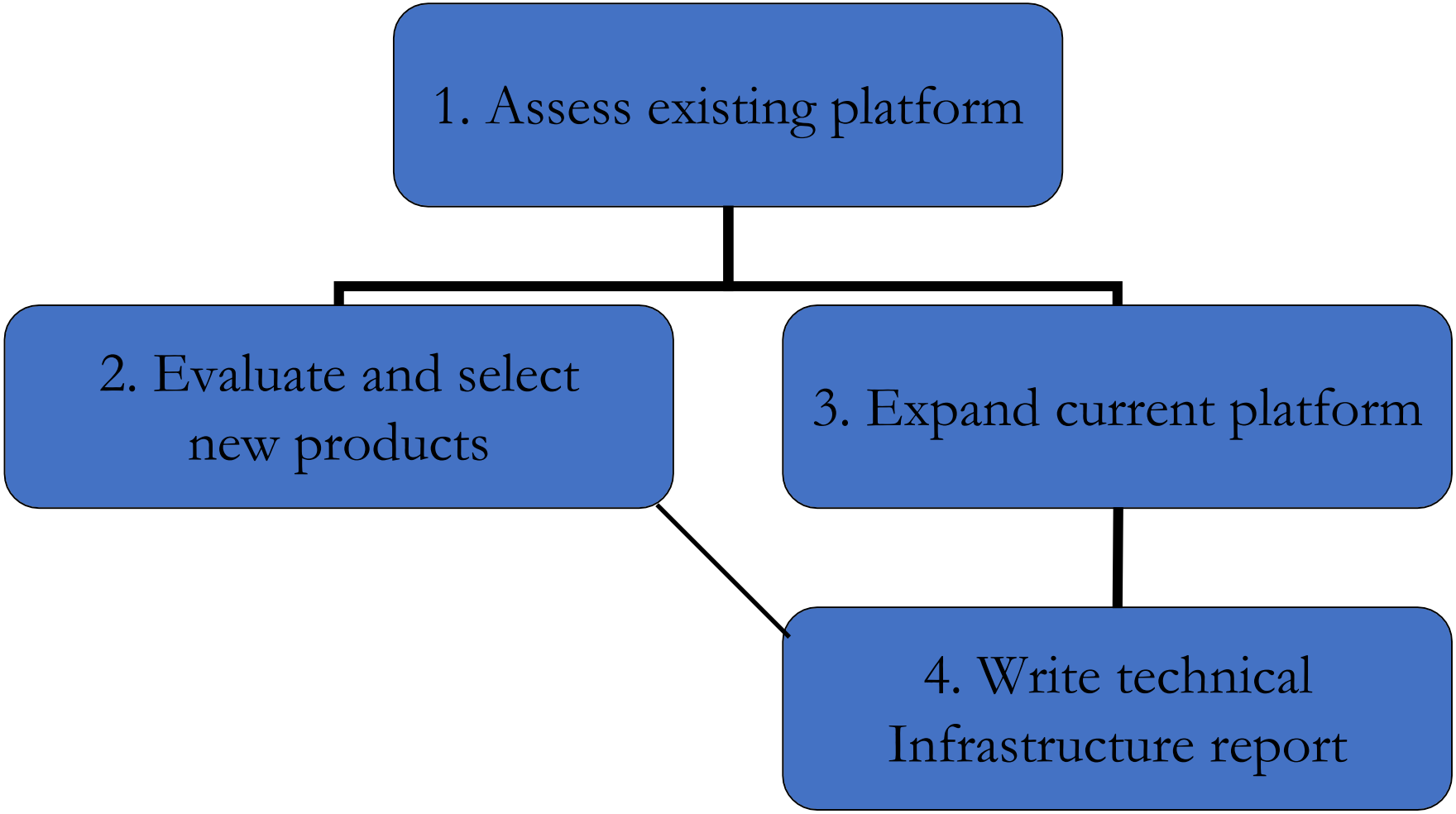
- Handling queries and data load
- Database scalability
- Internet integration
- Availability of advanced index schemes
- Unattended operations
- Network support
- Administrative support
- Future use/expansion
- Hardware scalability
- Query performance
- Load process and performance
- Security system
- Data dictionaries

Technical Infrastructure

- Data volumes
- Update frequency
- Data access patterns
- Number of reports and queries
- Number of people accessing the BI database
- Number of tools running against the BI database
- Number of data feeds for the BI database



Technical Infrastructure Evaluation Activities



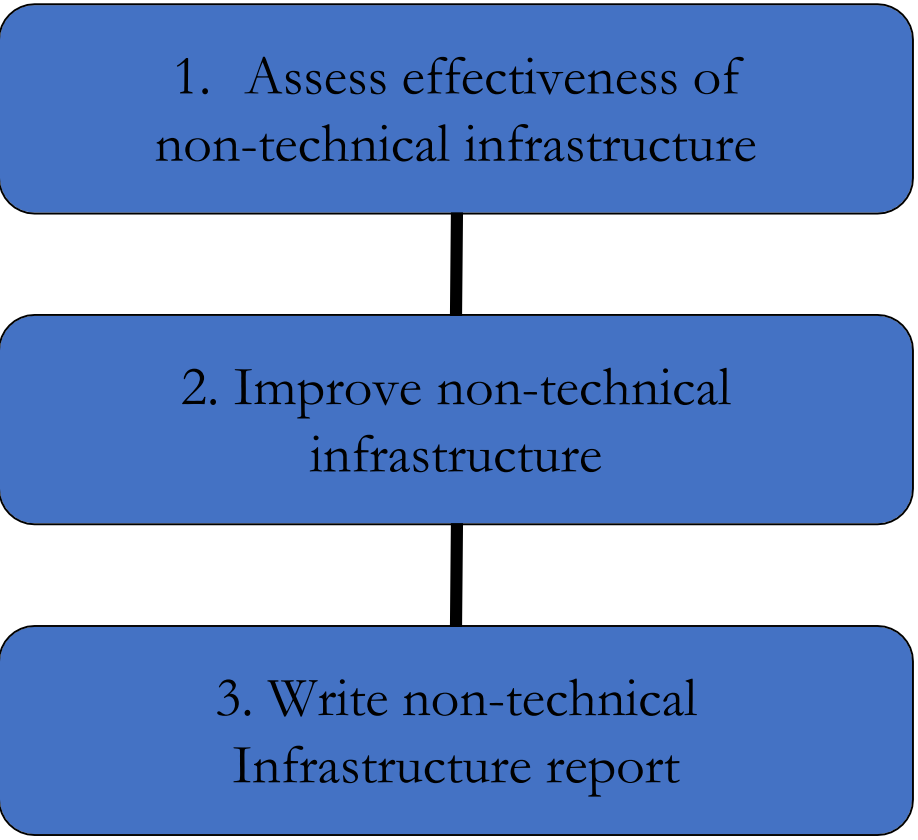
Planning the Non-Technical Infrastructure

- Assess effectiveness of non-technical infrastructure components
- Write non-technical infrastructure assessment report
- Improve non-technical infrastructure

Enterprise Standards

- Development Approach
- Data naming and abbreviations
- Meta data capture
- Logical data modeling
- Data quality
- Testing
- Reconciliation
- Security
- Service-Level Agreement (SLA)
- Policies & Procedures

Technical Infrastructure Evaluation Activities



Project Planning

- Managing the BI project
- Plan for setbacks
- Creating a project charter
  - Goals & objectives
  - Scope issues
  - Project risks
  - Constraints
  - Assumptions
  - Change Control
  - Issues Management
- Project planning activities

Project Planning – Simple Terms

- What will be delivered?
- When will it be done?
- How much will it cost?
- Who will do it?

Four Major Project Constraints

Scope

- Impossible to create a valid estimate for a project without a solid understanding of the scope
- Traditionally, scope is measured in functions performed
- BI projects should be measured by data elements
  - Analysis and preparation of data takes much longer
  - Assume 80% effort for data and 20% effort for function

Note: It is not reasonable to request a significant scope change to a carefully deliberated and agreed-upon project plan without adjusting any of the other constraints.

Project Risks

- Every project has risks
- Risks are unavoidable
- Use the Risk Assessment generated in Stage 1 (Business case analysis)
- Depending on the likelihood and the impact on the project a mitigation and/or contingency plan should be in the project plan
  - Triggers are situations that signal a potential, perhaps imminent materialization of a risk
  - The mitigation plan specifies what action the project team can take to prevent the risk from materializing
  - The contingency plan specifies alternatives in case the risk does materialize

Project Risks

- Common project risks
  - Lack of management commitment
  - Lack of business participation
  - Imposed, unrealistic schedule
  - Unrealistic scope for the schedule
  - Unrealistic budget
  - Unrealistic expectations
  - Untrained or unavailable staff
  - Constantly changing business priorities
  - Ineffective project management
  - Limited scalability

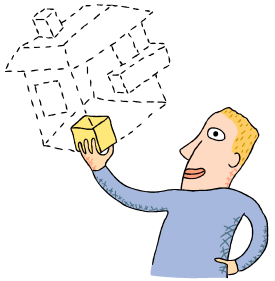
Constraints

- All projects are subject to the same project constraints: Effort, Scope, Budget & Resources
- In reality, there is a fifth constraint: Quality
- Quality and Effort (time) are polarized constraints
  - Higher quality requires more effort
  - Since time is a driving factor for most originations, Effort always has top priority

Note: For a BI project, quality should have a higher priority than any other constraint: Quality, Effort, Scope, Budget & Resources

Assumptions

- Anything taken for granted
- *(Wrong assumptions become risks)*
- Important assumptions should have a counterpart risk, identifying triggers, a mitigation plan and contingence plan



Change Control

- Manage change
- Curb scope creep
- Change (unless minute) always impacts the project
  - Effort (time), Scope and Quality
  - Sometimes Budget and Resources
- Changes should be submitted to change control board
- Changes must be logged and reviewed/approved by Change Control Board and tracked in project meetings
- Change log of the following information should be kept and updated: Change number, Change date, Change description, Status (approved, not approved or deferred), Current status or Resolution and Closed date

Change Control Board

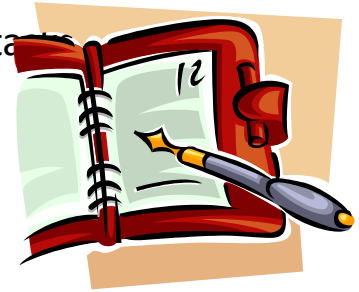
- Each change that must be added to a project requires a business decision:
  - Cut back on the current scope
  - Extend the deadline
  - Declare the change “not applicable” to the current release and postpone it
  - Incorporate the requested change in the next release
  - Eliminate complicated transformations, edit checks, and testing (impacts Quality)

Issues Management

- Issues, related to business or technical concerns, always occur during a project
- Issues need to be tracked and managed
- Every issue needs to be assigned to a person who has the responsibility to get resolution
- Issues must be logged and reviewed and tracked in project meetings
- Issue log of the following information should be kept and updated: Issue number, Issue date, Issue description, Assigned to, Action taken, Action Date, Resolution and Closed date

Planning the BI Project

- Not a one-time activity
- Estimates must be adjusted frequently
- The more detail you have in the first version of the project plan, the easer it will be to manage the project
- Sequence of activities for preparing a project plan (software available for these activities)
  - Create a work breakdown structure (WBS) listing activities, tasks and subtasks
  - Estimate the effort hours for each activities, tasks and subtasks
  - Assign resources for each activities, tasks and subtasks
  - Determine the task dependencies
  - Determine the resource dependencies
  - Determine the critical path based on the dependencies
  - Create the detailed project plan
- Expect to revisit and rework the plan often based on development activities
- Needs to be revisited when a Change is approved for this project by the Change Review Board



Estimating Techniques

- Historical, based on learned patterns (how long it took on the last project)
- Intuitive, based on intuition and experience (“gut” estimating)
- Formulaic, based on the average of possibilities

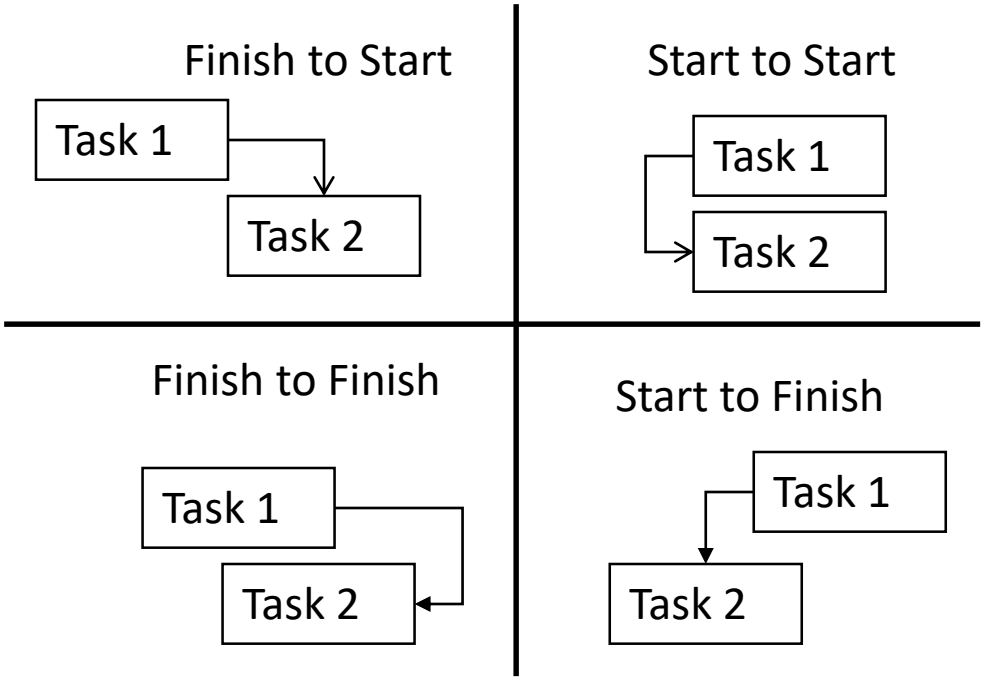
$$\frac{\text{Best Estimate} + (\text{Average Estimate} \times 4) + \text{Worst Estimate}}{6}$$

Resource Assignment

- Effort estimates cannot be completed until the activities and tasks are assigned
- Estimates must take into consideration each team member's skill level
- Remember to take into account
  - Administrative factors: meetings, other projects, emails, in-baskets, training, etc.
  - Non-work-related: vacation, illness, jury duty, personal time off, medical appointments, holidays

Task Dependencies

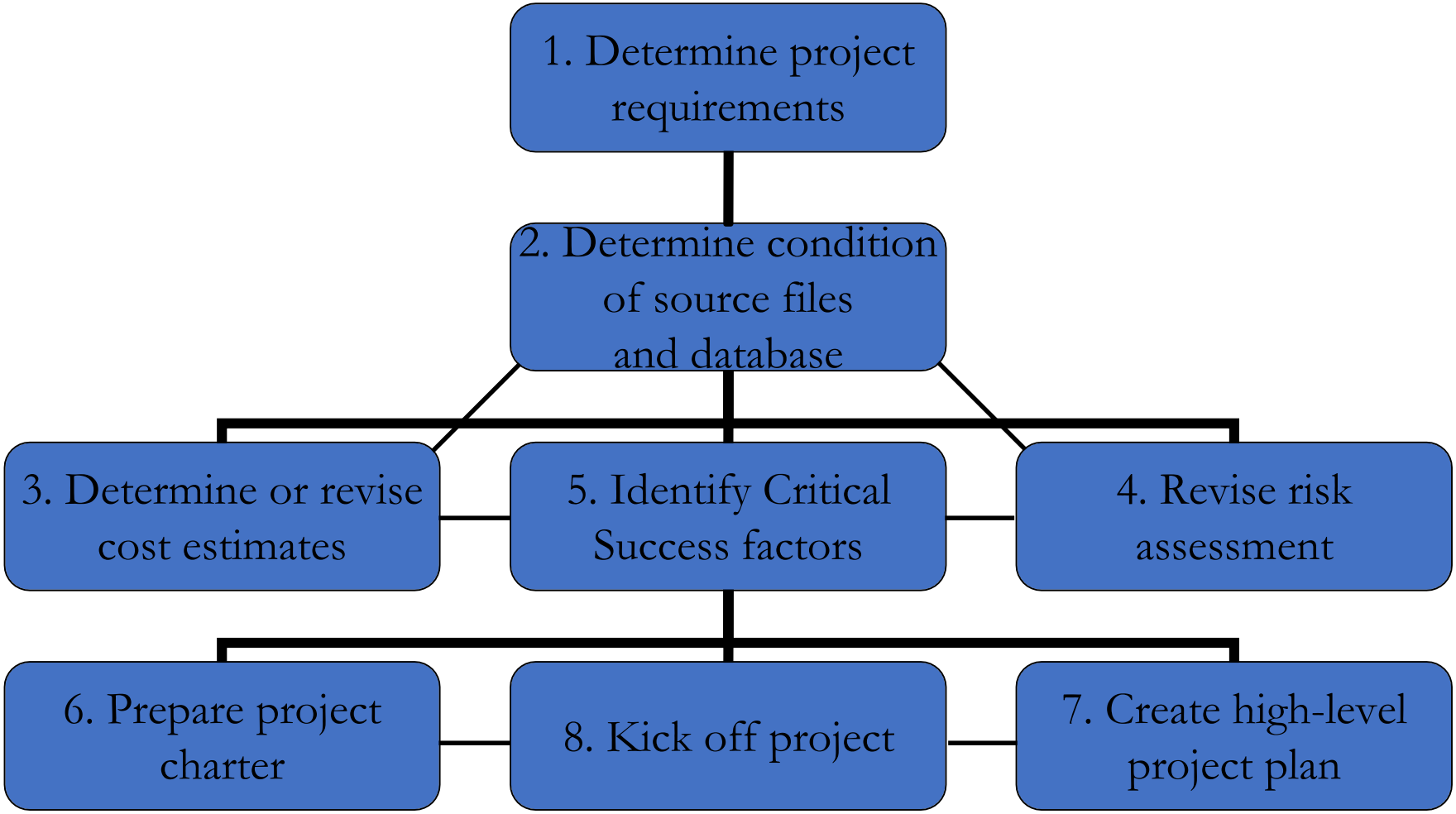
- Not all activities and tasks have to be performed serially
- Many can be performed in parallel
- Identify task dependencies:
  - **Finish to Start**
  - T2 cannot start until T1 finishes
  - **Start to Start**
  - T2 can start with T1
  - **Finish to Finish**
  - T2 cannot finish until T1 finishes
  - **Start to Finish**
  - T2 cannot finish until T1 starts



Project Schedules

- Once you have all the tasks, resources, dependencies and estimates you can create a project schedule
- Creating a useful plan requires effort
- Once done adjusting it is not labor intensive
- Using a proper software tool, any changes automatically cascade through the entire project
- Get a skilled Project Manager

Planning Activities



Planning Deliverables

- Technical infrastructure report
  - Scalability & Limitations: Servers, Workstations, OS, Middleware, Network, DBMS, Software, etc.
- Non Technical infrastructure report
  - Standards, Methodology, Estimating guidelines, Scope management, Issues management, Roles/Responsibilities, Security process, Meta data capture, Process for merging logical data, Data quality, Testing process, SLA's, Support, Dispute resolution, Communication process, etc.

Planning Deliverable (continue)

Project Charter

- Represents the agreement between the IT staff and business sponsor
  - Goals and objectives
  - Statement of business problem
  - Proposed BI solution
  - Results from cost-benefit analysis
  - Results from the infrastructure gap analysis
  - Functional project deliverables
  - Subject areas to be delivered
  - High-level logical data model
  - Items not within the project scope

Planning Deliverable (continue)

Project Charter (continue)

- Condition of the source files and database
- Availability of security requirements
- Access tool requirements
- Roles and responsibilities
- Team structure (core and external)
- Communication plan
- Assumptions
- Constraints
- Risk assessment
- Critical Success Factors

Project Plan

- i.e., WBS, Pert chart, Gantt chart, task estimates, task dependencies and resource dependencies
- Hint: Use a project planning tool

Stage Three

Business Analysis

Stage Three: Business Analysis

(4) Project Requirements Definition

- Manage Project Scope (avoid everything instantly)
- Plan for change (change control board)

(5) Data Analysis

- Quality and source of data
- Learn what you have – consolidate and reconcile

(6) Application Prototyping

- System Analysis
- Prove or disprove a concept or an idea
- Allows the business people to see the potential and the limits of the technology

(7) Meta Data Repository Analysis

- Technical meta data needs to be mapped to the business meta data
- Can be licensed (bought) or built (from internal systems)

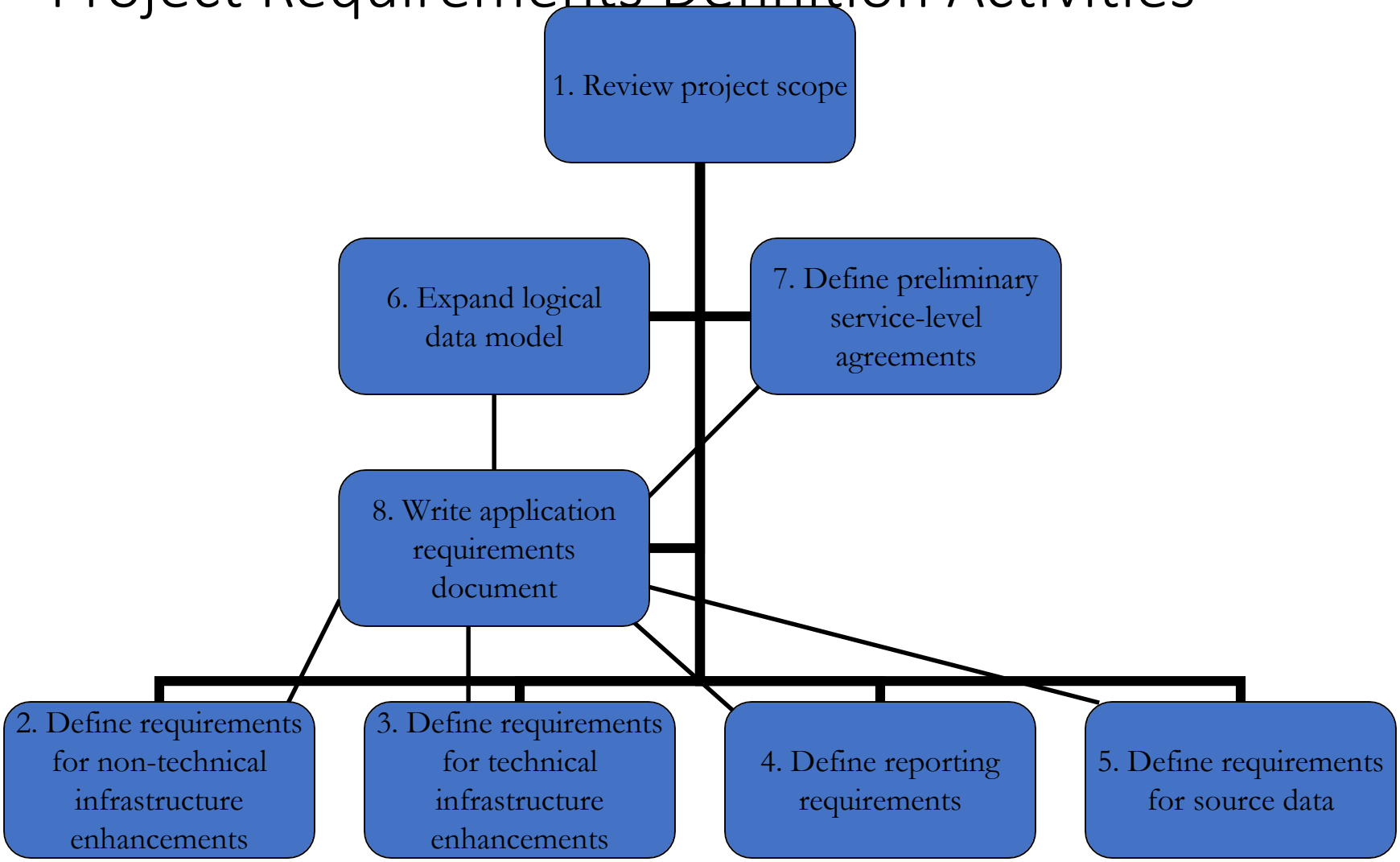
Project Requirements Definition

- General Business Requirements
- Project-Specific Requirements
- Get input from users
- Get input from business management
- Create application requirements document

Requirements Documents

	General Business	**Project-Specific**
Purpose	Determine the general business need	Define the specific functions and delivery date
Interviewees	• Business executives • IT managers & staff • Line-of-business managers • Subject matter experts (SME)	• Business sponsor • Business representative • Knowledge worker/Business analysts • Subject matter expert (SME)
Deliverable	Business requirement report	Application requirements document
Content of deliverable	• Findings • Issues • Opportunities • Recommendations • Next steps	• Functional requirements • Data requirements • Data-cleansing requirements • Performance • Security • Availability

Project Requirements Definition Activities



Data Analysis

- Bring business data together from multiple sources
- Business-focused data analyses
- Top down logical data modeling
  - Integrate enterprise logical data model data-specific business meta data components
- Bottom up source data analysis
  - Transformation rules, technical data conversions, business data domain rules and business data integrity rules
- Data Cleansing Activities

Top Down Logical Data Model

- Logical data model (AKA Enterprise Logical Data Model)
  - Unique identifiers
  - Correctly named
  - Properly defined

- Validated for all business people who access the data
- Formal representation of the data exactly as it exists without redundancies and ambiguity
- A logical data model, representing a single-cross organizational business view of the data

Top Down Logical Data Model

- Standardized Business Meta Data defined:
  - Name (no synonyms & no homonyms)
  - Definitions (description of the data)
  - Relationship (business associations/rules/policy)
  - Type (structure: character, number, decimal, date, & time)
  - Length (size)
  - Content (available values)
  - Rules (content of the data)
  - Policy (content and behavior)
  - Ownership (who can establish and contro ta)

Bottom Up Source Data Analysis

- Defining the source data files
- You will find business rules violations and some data quality issues
- Map the source data elements to the new top down logical data model
- Decide what elements of the source data can build the new top down logical data model

Bottom Up Source Data Analysis

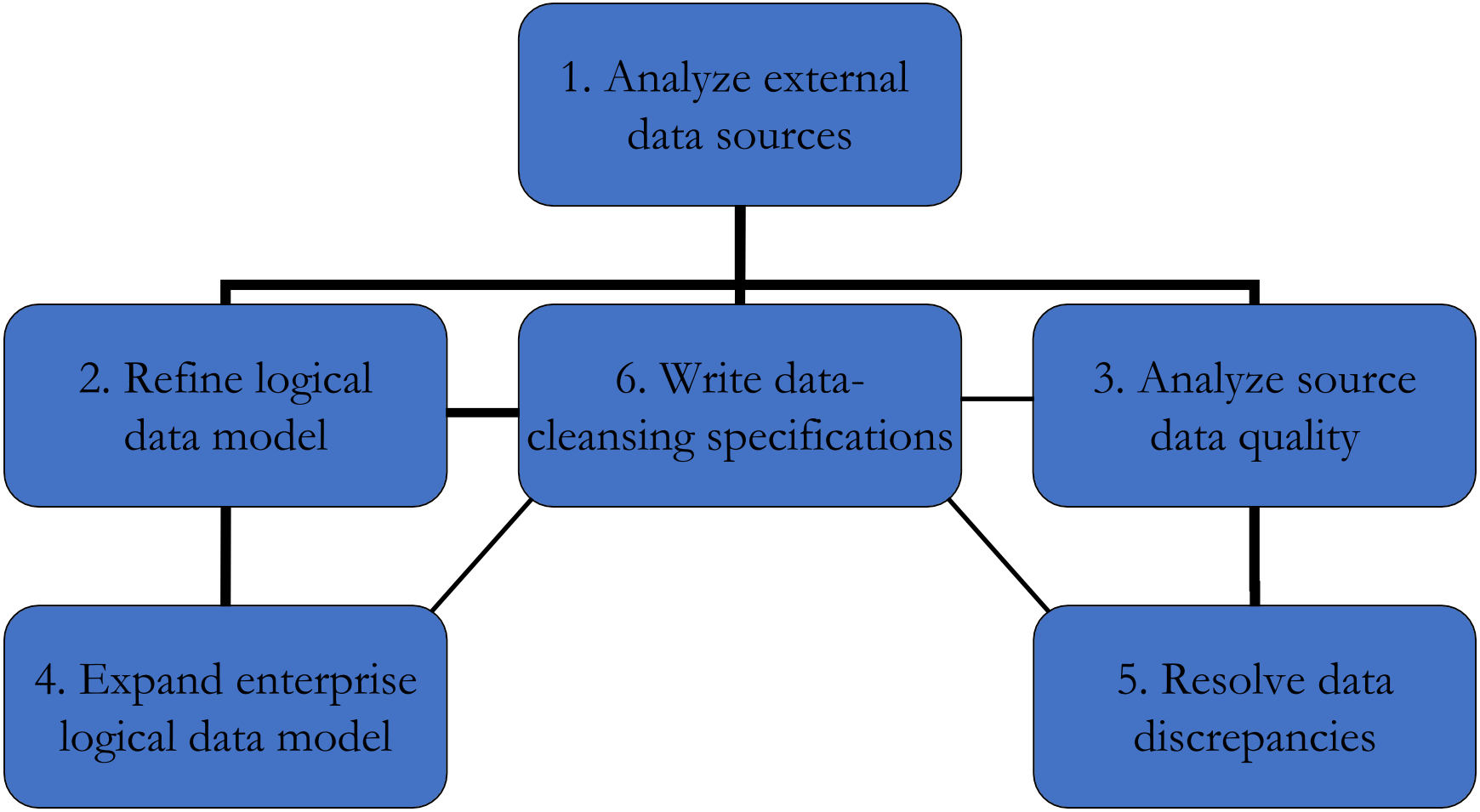
- Typical problems in the source data
  - Missing data values
  - Strange “default” values i.e., 999999, 9/9/9999
  - Intelligent “dummy” values i.e., 888-88-8888
  - Cryptic or overused values i.e., letters to define customer type

Final Source Data Selection Process

- Identify the required data (logical data model)
- Analyze the data content (source data)
- Select the data for BI
- Prepare the data cleansing specifications
- Identify the ETL cleansing requirements

1. Identify the required data
2. Analyze data content
3. Select data for BI
4. Prepare data cleansing specifications
5. Select tool or method

Data Analysis Activities



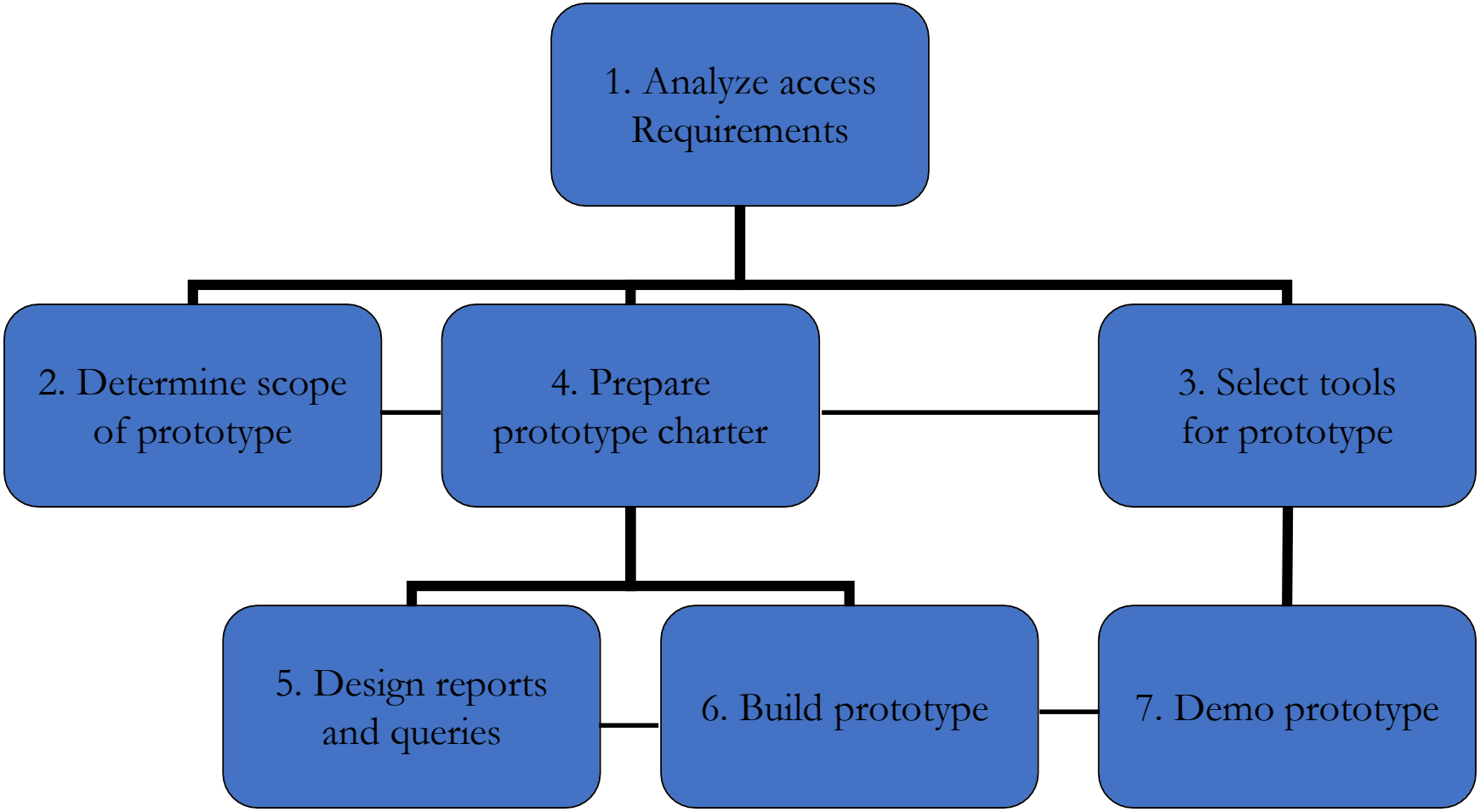
Application Prototyping

- If time & budget permits
- Prototyping can be effective way to validate application requirements
- Can find missing pieces & discrepancies in the requirements
- Verifies the selected DBMS and/or tools
- Limited time period
- Limited scope
- Choose the correct data

Types of Prototyping

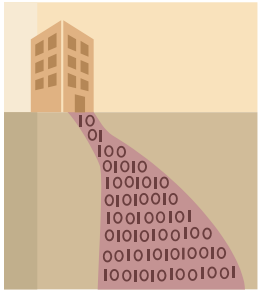
- Show-and-tell (Demo)
- Mock-up (simple throwaway)
- Proof-of-concept (explores implementation risks)
- Visual-Design (complex mock-up)
- Demo Prototype (sophisticated show-and-tell)
- Operational prototype
  - Most involved, most complete & almost fully functional
  - Functioning pilot (alpha/beta release)

Application Prototyping Activities



Meta Data Repository Analysis

- Database
  - Meaning & content of the business data
  - Policies that govern the business data
  - Technical attributes of the business data
  - Specifications that transform the business data
  - Programs that manipulate the business data



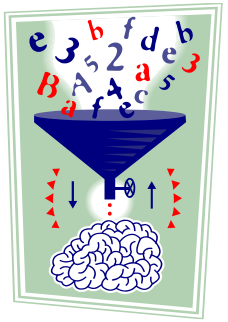
Business Meta Data vs. Technical Meta Date

Business Meta Data	**Technical Meta Data**
Provide by business people	Provided by technicians or tools
Documented in business terms on data models	Documented in technical terms in databases, files, programs & tools
Used by business people	Used by technicians, databases, programs & tools
Names fully spelled out in business terms	Abbreviated names (as the rules of the database dictates)

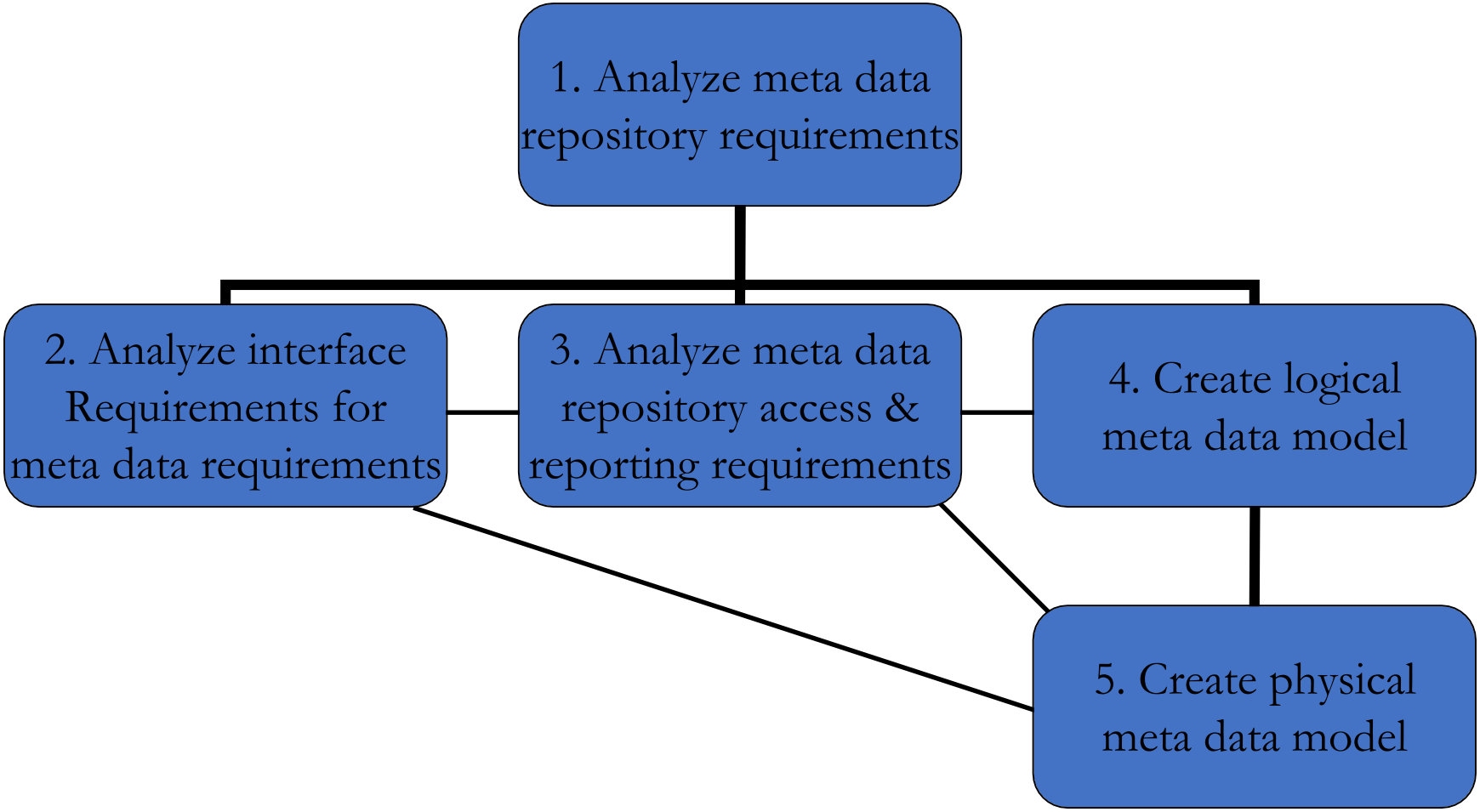
Data Standardization

- Every BI project must address the existing data chaos
- Pull together all existing documentation & create documentation where missing
- Building a proper BI database is not a trivial task
- Be aware of missing data!

Note: Lack of data is a frequent reason used for BI application failure



Meta Data Repository Analysis Activities



Business Analysis Deliverables

- Project Requirements
  - Applications Requirements Document
    - Technical & Non-Technical infrastructure
    - Reporting requirements
    - Requirements for source data
    - Data cleansing requirements
    - Security requirements
- Data Analysis
  - Logical & Business data model
  - Data cleansing specifications
  - Document enterprise logical data model

Business Analysis Deliverables (continue)

- Prototype Charter
  - Purpose
  - Objectives
  - Data used
  - Hardware & Software
  - Measure of successes
  - Application interface
- Completed prototype
- Revised application document
- Issues Log/Lessons Learned
- Logical & Physical data models

Stage Four

Design

Stage Four: Design

(8) Database Design

- Store the business data
- Detailed or Aggregated forms
- Must match the information access requirements of the business user

(9) Extract/Transform/Load (EDL) Design

- Most complicated/Least glamorous part of the project
- Cleansing and transformation of the source data
- Data quality

(10) Meta Data Repository Design

- Has to meet the requirements of the logical data model

Database Design

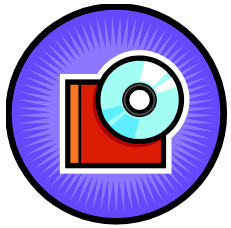
Operational Database	BI Database
Geared towards eliminating redundancies, coordinating updates and repeating same types of operations	Geared towards supporting a wide range of queries & reports
Sub-second response time	Sub-second cannot be expected
Highly normalized to support consistent updates	Highly de-normalized to provide quick retrieval of a wide range of large amounts of data
Data is usually deliver when needed	Store large amounts of data to save time on delivery
Historical records are archived	Store large amounts of historical data
Lightly summarized, mostly for reporting purposes	Many levels of pre-calculated summarized data – from lightly summarized to highly summarized

BI Target Databases

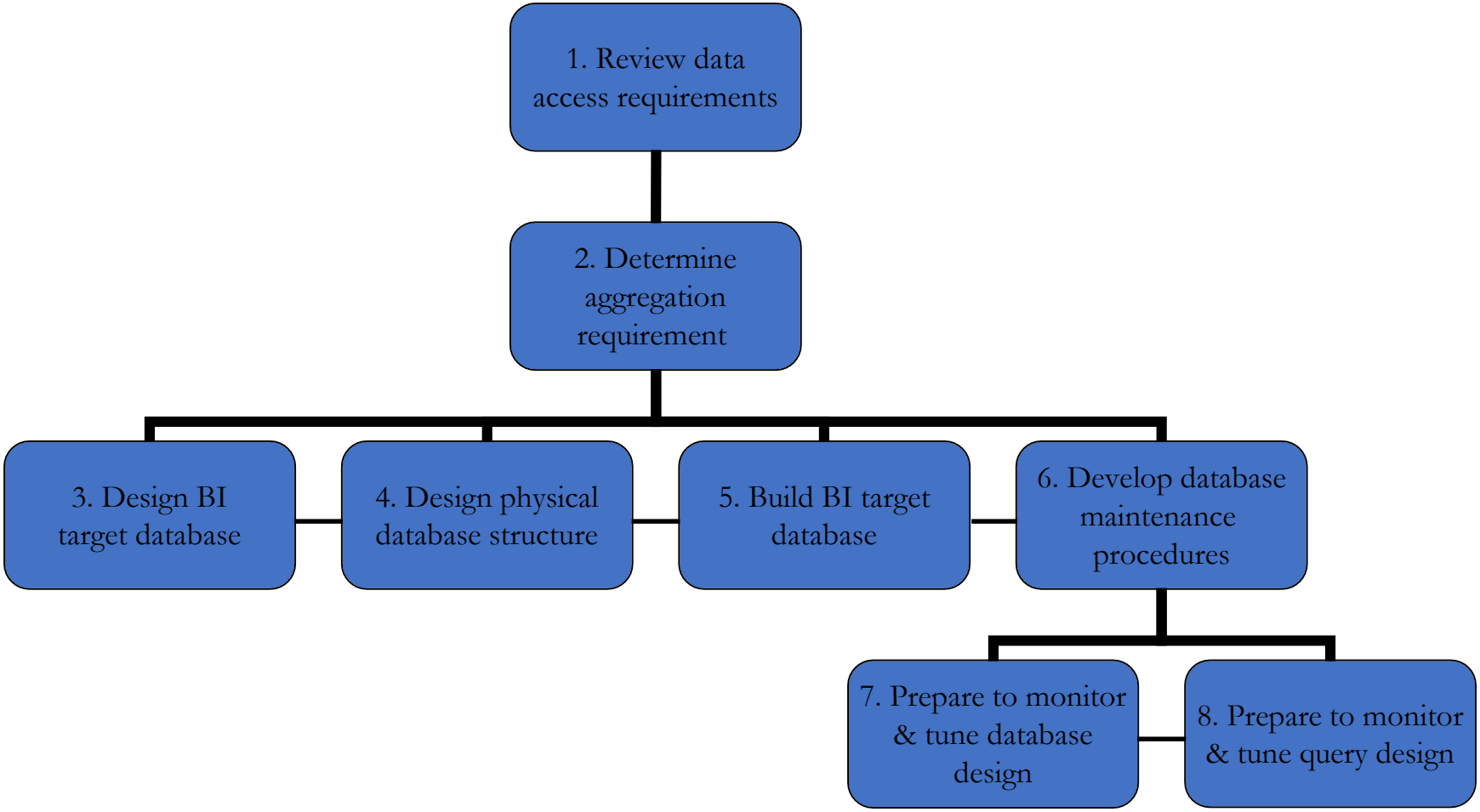
- BI databases are designed for simplicity
- High-performance data retrieval
- Not for efficient data storage & maintenance
- Eliminate or minimizing data redundancies is not a goal – but must be controlled
- Readily accessible
- Design is driven by access and usage
- Intuitive for a business person
- BI data must be derived from current internal or external data sources

Physical Database Design

- BI databases can be enormous
- Consider indexing (B-tree, inverted files, etc.)
- Remember to factor in backup and recovery



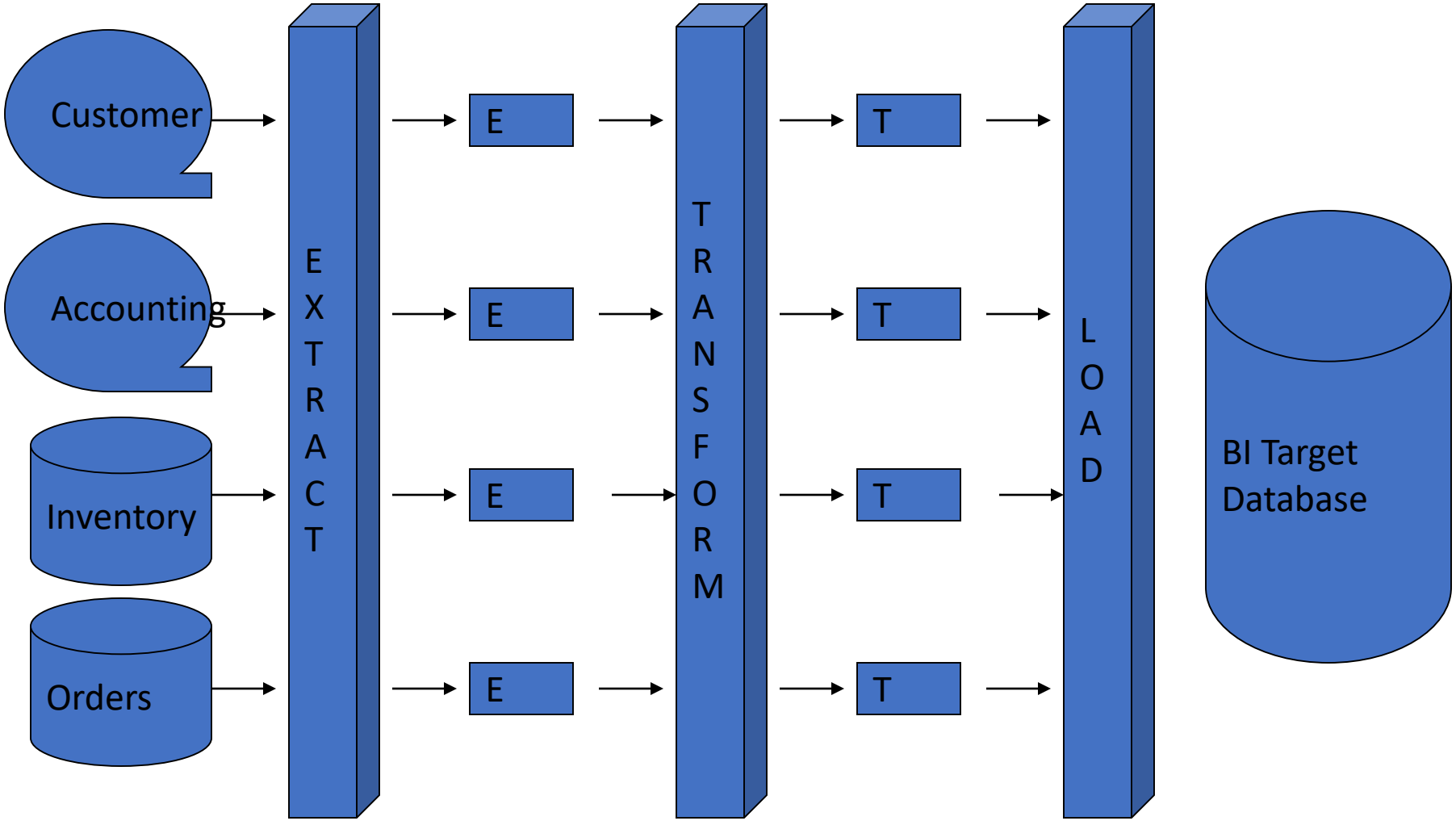
Database Design Activities



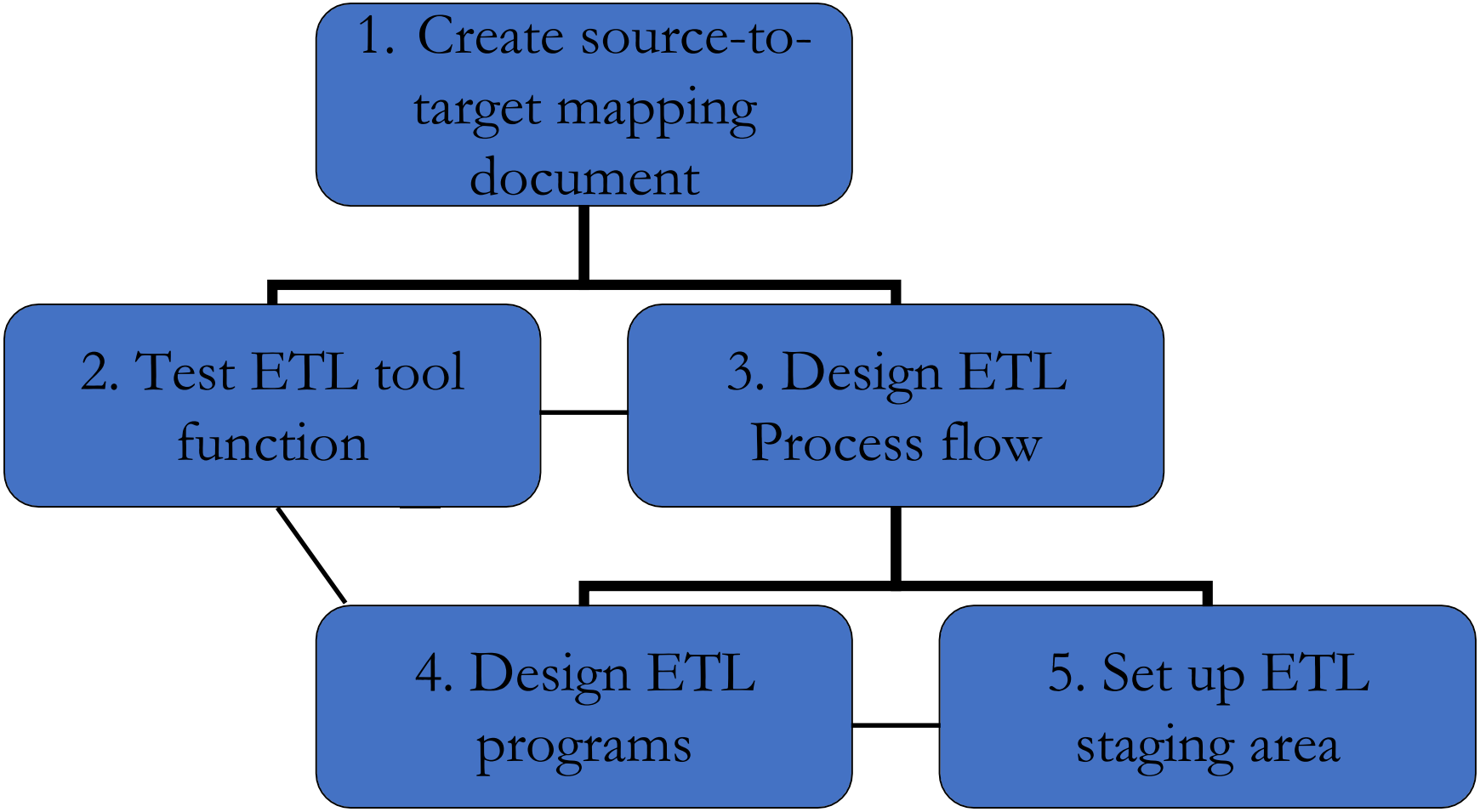
Extract/Transform/Load (ETL) Design

- Build a loading process in which all BI target databases are integrated & reconciled
- Integrated strategy – one common database for all the data regardless of the source
- One common ETL procedure
  - Reformat
  - Reconcile
  - Cleansing
- Set of ETL programs
  - Initial Load (from current operations)
  - Historical load (from archive data)
  - Incremental load (daily batch data)

ETL Process


Customer
Accounting
Inventory
Orders
EXTRACT
E
E
E
E
TRANSFORM
T
T
T
T
LOAD
BI Target Database

ETL Design Activities



Meta Data Repository Design

- Meta data repositories used to be called data dictionaries
- Design is based on database chosen

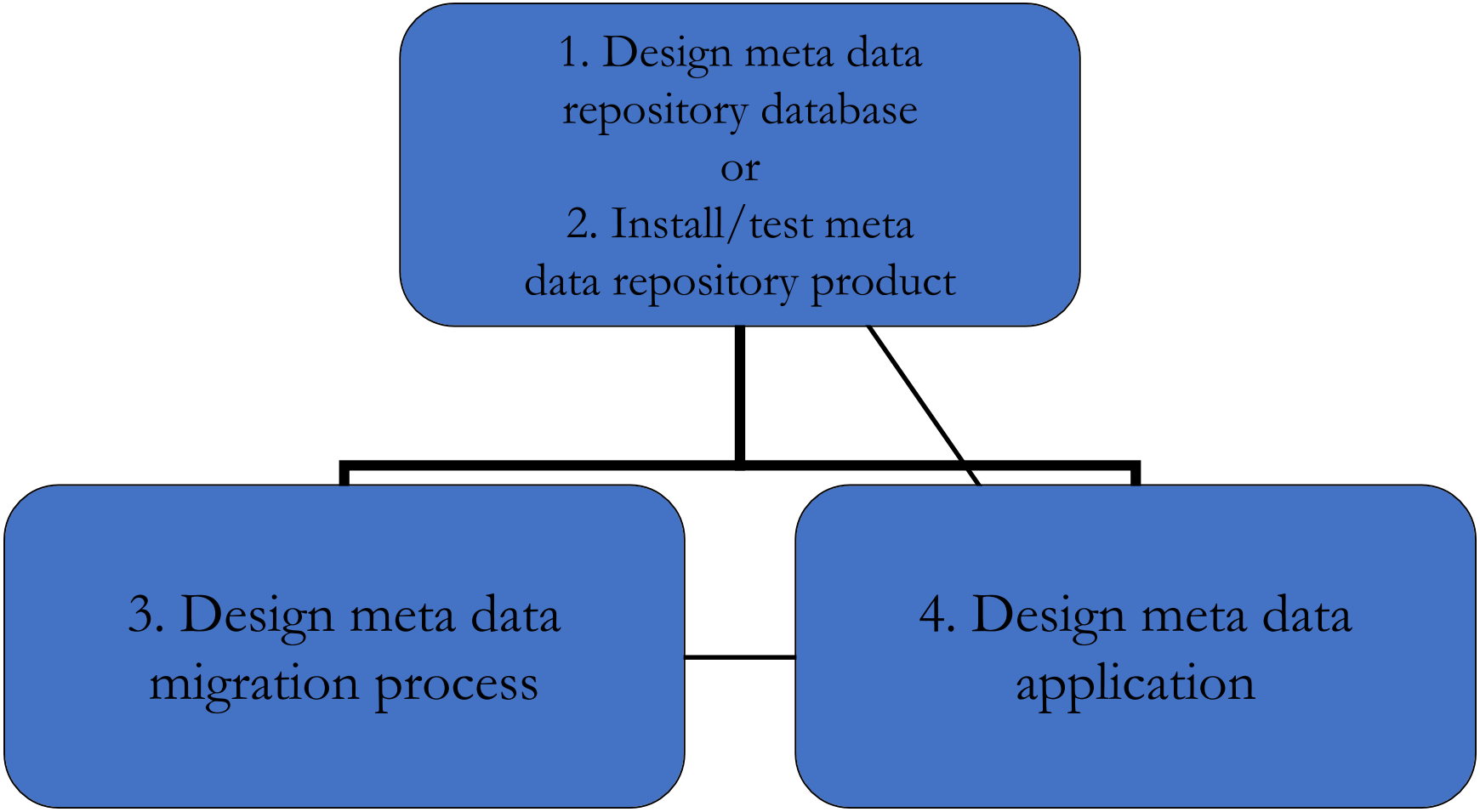
Meta Data

A definition and classification of the various levels of end user meta data.

Level	Level Name	Genesis
5	Report data	Within a report, data is manipulated into a format that is required.
4	Business intelligence data	Data which has been extracted by a BI application. This data may be manipulated using business rules.
3	Transformed data	Data that has been transformed using business rules into a format that is meaningful and is stored within a database.
2	Cleansed data	Data which has been processed through a cleansing routine which standardizes the format and is stored within a database.
1	Source system data	Data which has been migrated from several source systems into one database and is commingled.
0	Migrated data	Data which has been entered or processed by an online transaction processing application.

Note: While the levels define the transgression of data from its origin to a report, the complexities of each level can have a significant impact on the definition of the data. Please note that not all levels of end-user meta data are encountered by an individual using a BI application.

ETL Design Activities



Design Deliverables

- Database Design
  - Physical data model
  - Physical design of the BI target database
  - Data definition
  - Physical BI target database
  - Database maintenance & procedures (backup)
- ETL Process
  - Source-to-target mapping document
  - ETL process flow diagram
  - ETL program design document
  - ETL programming environment description
- Meta Data Repository
  - Physical data model
  - Data definition (data dictionaries)
  - Data control language (MV Access statements)
  - Data repository programming specifications (programming logic)

Stage Five

Construction

Stage Five: Construction

(11) Extract/Transform/Load (ETL) Development

- Build the programs based on ETL Design

(12) Application Development

- Based on the prototype or finalized design
- Can be done in parallel with ETL Development

(13) Data Analysis

- Uncover the hidden information in the data

(14) Meta Data Repository Development

- Implement the database design

ETL Development

- Source data transformation
- BI projects present the best opportunity to eliminate useless data
- Data transformation activities
  - Cleansing/Clean data
  - Summarization/Condensed data
  - Derivations/New data
  - Aggregation/Complete data
  - Integration/Standardized data

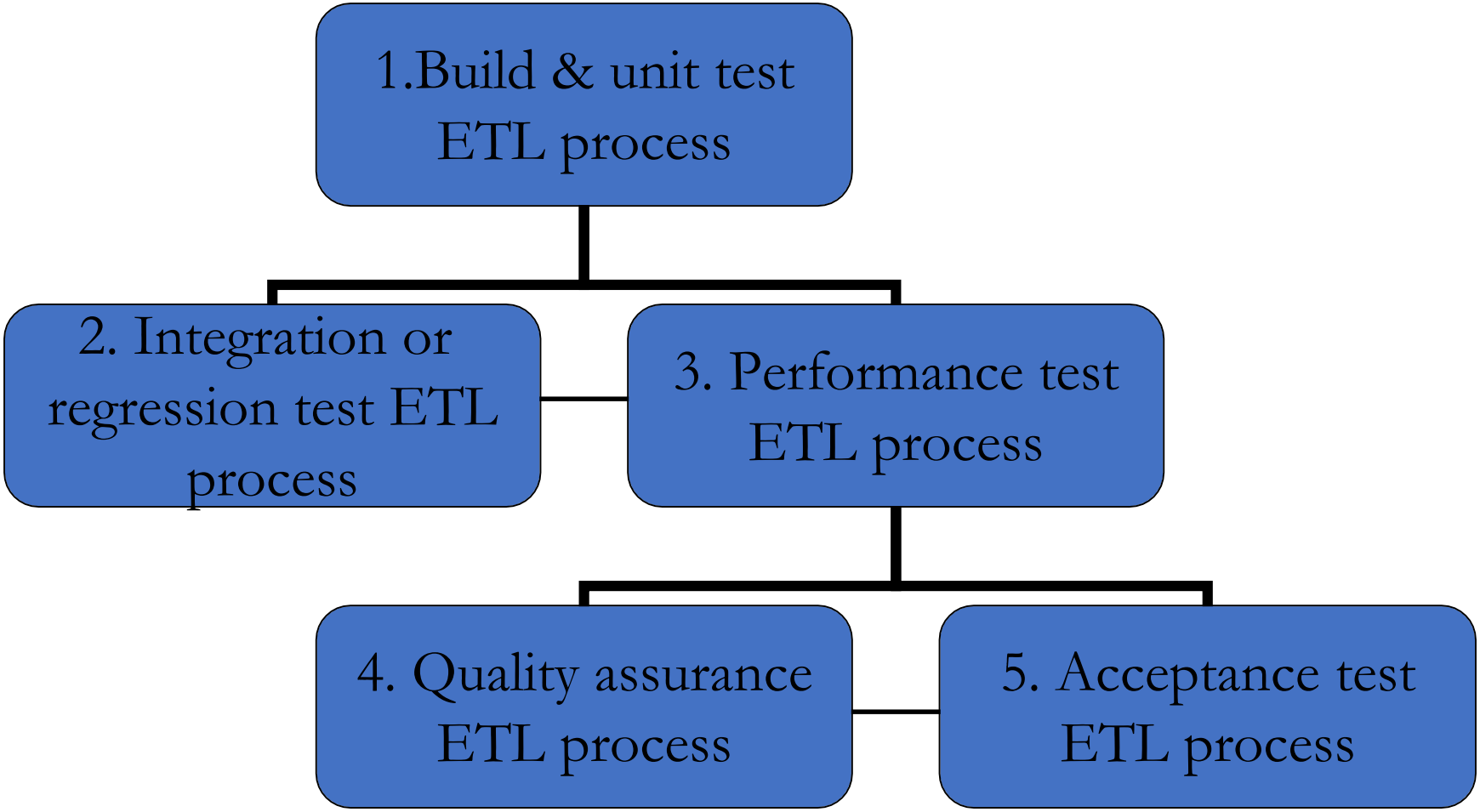
Reconciliation

- Common complaint: BI target database does not match the operational source files
- Reconciliation Process
  - Record counts
  - Domain counts (unique data values)
  - Amount counts
- Prove the BI data is correct or business users will not trust t

ETL Testing

- Formal test plan
  - Purpose
  - Schedule
  - Test cases
  - Test log
- Unit tests (does it work)
- Integration tests (do the programs run together)
- Regression tests (did the new programs break original code)
- Performance tests (does the program perform with volumes)
- Quality Assurance tests (documentation an affect on other programs)
- Acceptance tests (does the application work)

ETL Development Activities



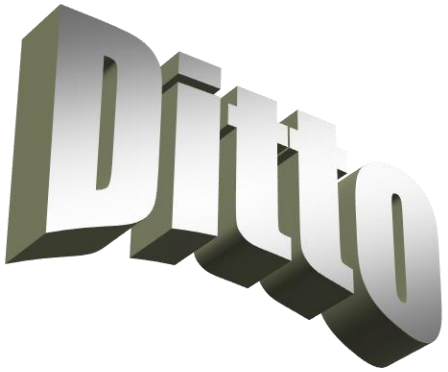
Application Development

- Online Analytical Processing Tools
  - Many
  - Popular features:
    - Multidimensional views
    - Summarizations & Aggregation
    - Query & Analysis capabilities
    - Business Analysis
    - Drill-down, Roll-up and Drill Across
    - Trend Analysis
    - Display data in Charts & Graphs

Development Environments

- Prototyping
- Development Environment
- QA Environment
- Production Environment

Application Testing



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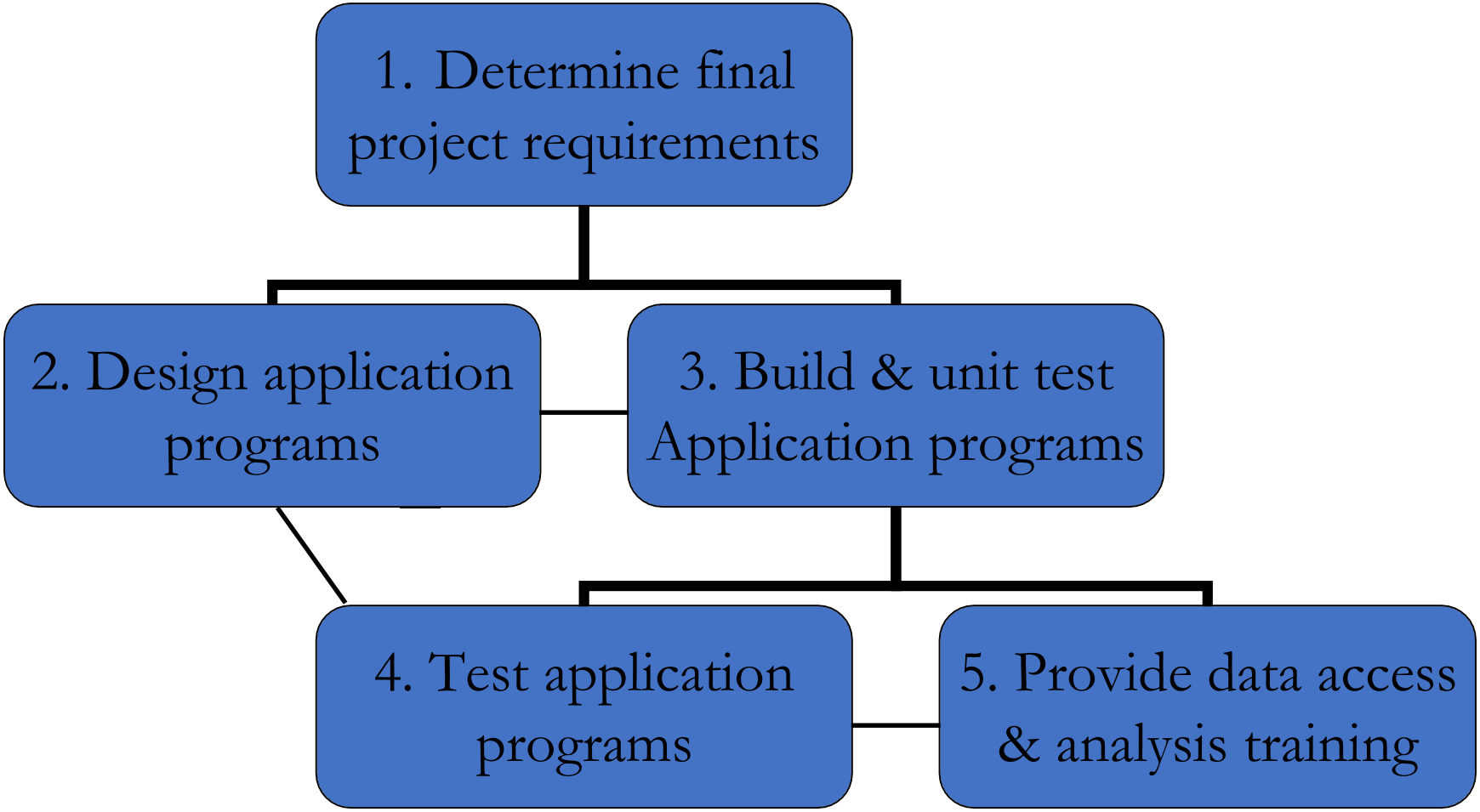
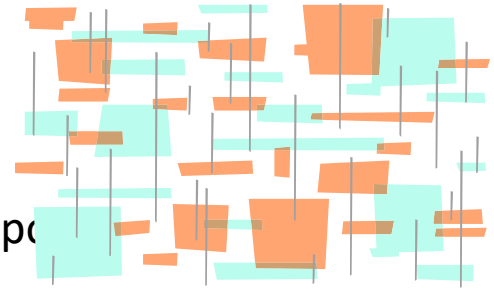
Application Development Activities



Defining Data Analysis

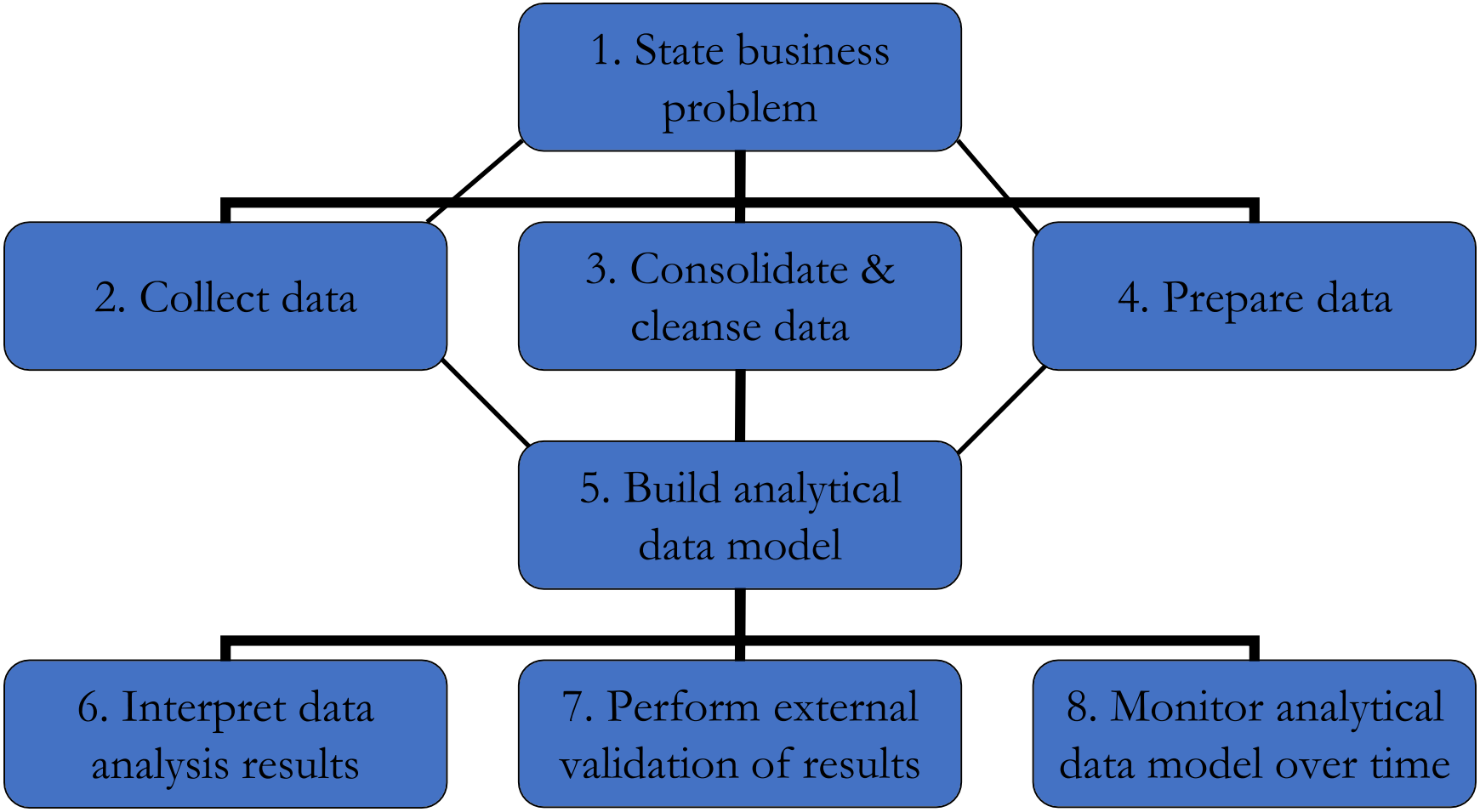
- Blend of Components
  - Intelligence
  - Pattern Recognition
  - Databases
  - Traditional Statistics
  - Graphics
  - Present hidden relationships & patterns in the data p



Data Analysis Tools

- Executive Information System (EIS)
- Query & Reporting tools
- Statistical tools
- Online Analytical Processing (OLAP) tools

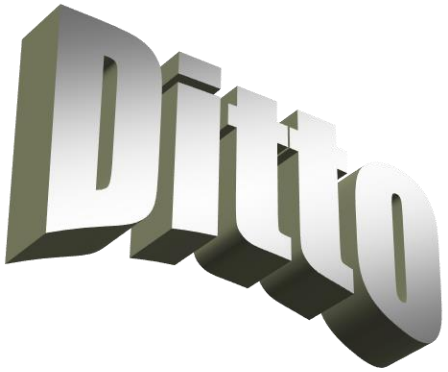
Data Analysis Activities



Meta Data Repository Development

- Populating a Meta Data repository
- Receives most of its Meta Data from sources
- Data sources
  - Spreadsheets
  - Case tools
  - Internal databases (dictionaries)
  - ETL tools & programs
  - OLAP tools & programs
  - Data Analysis tools
- Meta Data repositories are active
- Prepare for rollout

Meta Data Repository Testing



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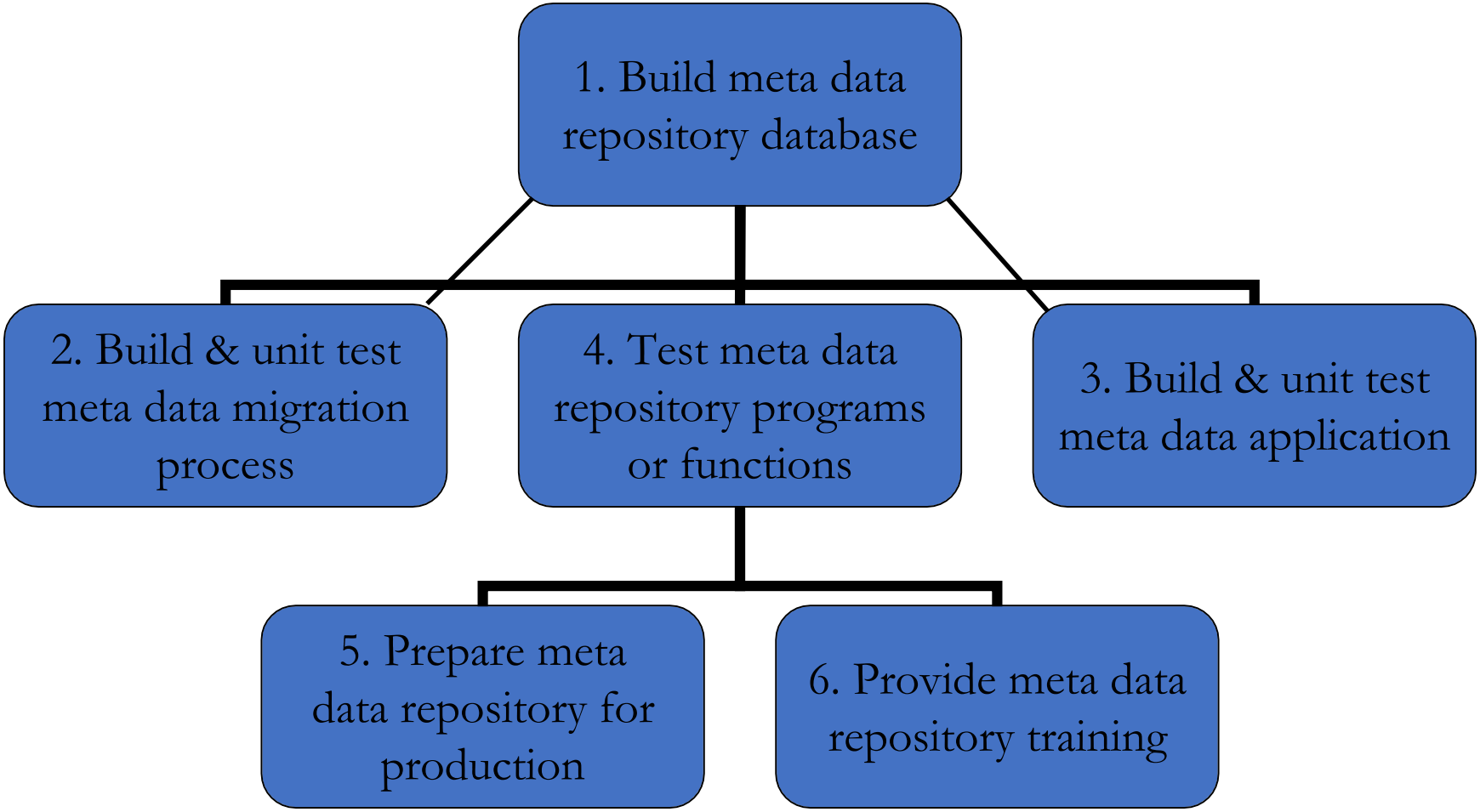
Meta Data Repository Devlopment Activities



Construction Deliverables

ETL Development
- ETL Test plan
- ETL Programs

Application Development
- Application design document
- Application test plan
- Application programs
- Training materials

Data Analysis
- Database
- Analytical model

Meta Data Repository Development
- Physical Meta Data Repository Database
- Meta Data Repository test plan
- Meta Data Repository Programs
- Meta Data Repository documentation
- Meta Data Repository training materials

Stage Six

Deployment

Stage Six: Deployment

(15) Implementation

- Rollout of the database and application
- User training
- Support functions begin (help desk, database backup, operations)
- Monitoring of performance and database tuning

(16) Release Evaluation

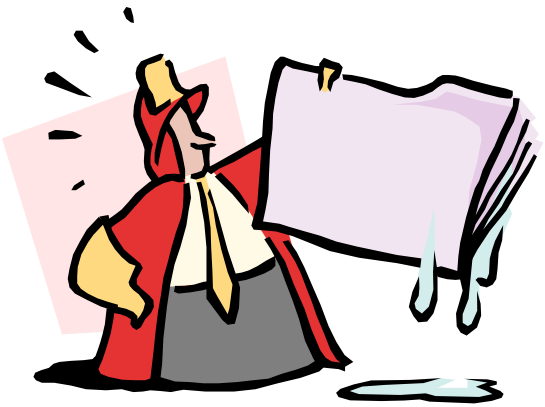
- Lessons learned
  - Any missed deadline, cost overruns, disputes, dispute resolutions should be examined and processes adjusted for future projects
  - Any tool, techniques, guidelines and processes that were not helpful should be reevaluated and adjusted or discarded

Implementation

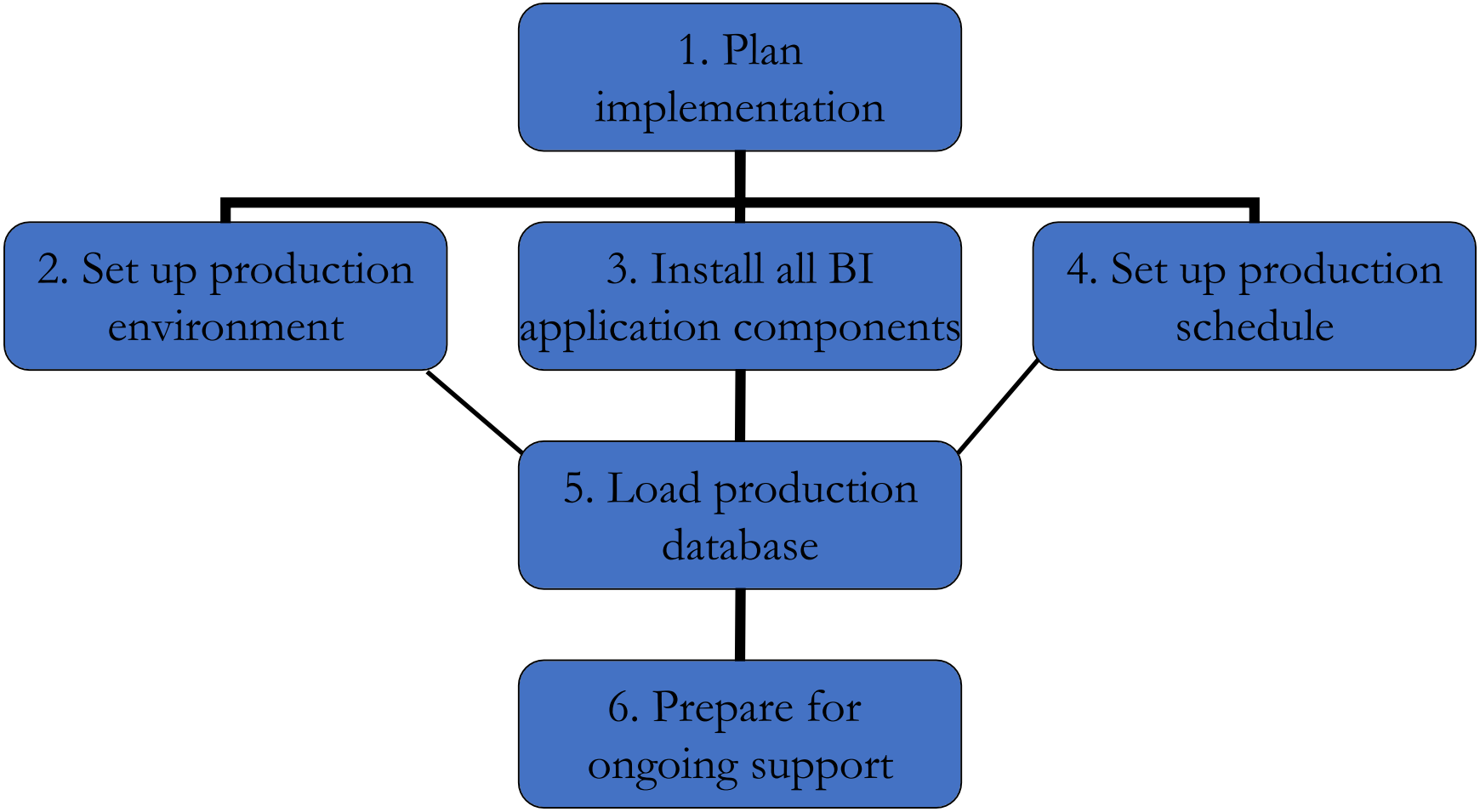
- Incremental rollout
  - Small group
  - Training & support
  - Consider another test – perhaps adjust application
- Security management
  - Test security policy's
  - Secure at file/table level may not be enough
  - Consider program control
  - Network security – review network architecture
  - Look for security gaps
    - Password violations
    - Data security
  - Security for internet access
    - Authentication (user ID & password)
    - Authorization (access to resource)
    - Encryption (encrypt data from server to workstation)

Implementation

- Data backup & recovery
  - Full backups
  - Incremental backups
  - Partial backups
- Monitor utilization of resources
  - Computer utilization
  - Network utilization
  - Personnel – who is using what & when
- Monitor Growth
  - In data
    - Calculate average daily growth
    - Remember to calculate any indexing
  - In usage
  - In hardware



Implementation Activities



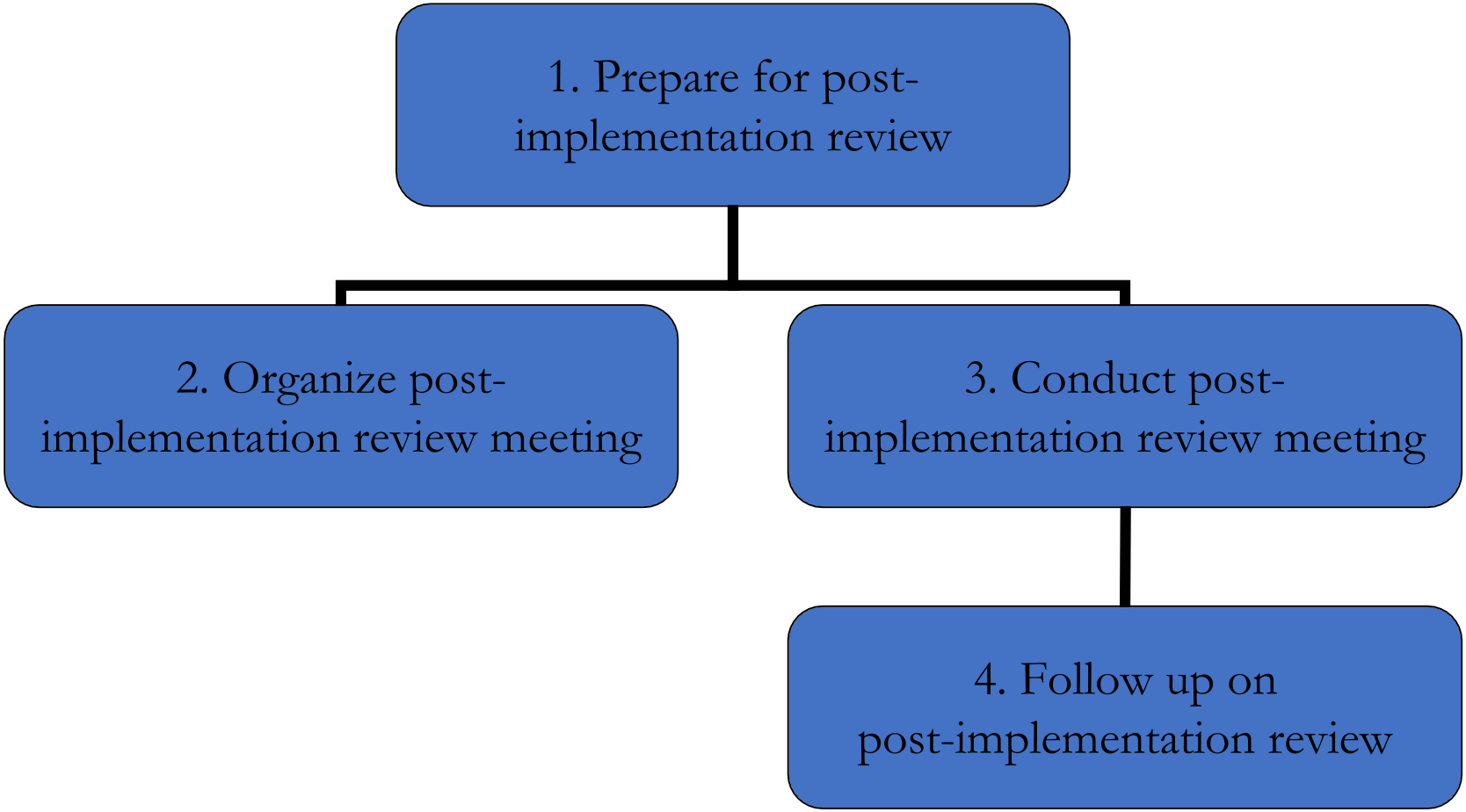
Release Evaluation

- Nothing works 100% the first time
- The application release concept/guidelines
  - Schedule release every 3-6 months
  - Small & manageable deliverables
  - Manage expectations
  - The first release should deliver the basics
  - Management must accept a partial delivery
  - Everything is negotiable (scope, schedule, budget, resource & quality
  - Infrastructure must be robust
  - Data must be an integral part of each release
  - Change control procedure
    - New requirements
    - Defects
    - Review deferred functions/data/change

Post Implementation Review

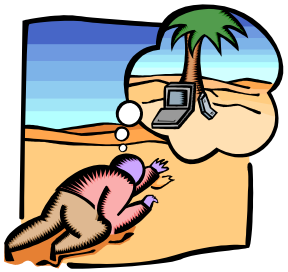
- Measure Success / Problems / Failures
  - Schedule
  - Budget
  - Scope
  - Staffing
  - Skill & training
- Plan for the next release
  - Review Topics:
    - Project planning & reporting
    - Development approach
    - Contractors, consultants & vendors
    - General communications
    - Lessons learned

Release Evaluation Activities



Development Deliverables

- Implementation
  - Production Code
    - ETL
    - Application
    - Database
    - Data Repository
  - Production Documentation
- Release Evaluation
  - Post implementation review agenda
    - Remember to review all deferred change requests
  - Post implementation meeting minutes
  - Create action item list
  - Produce lessons learned report
  - Save actual work efforts (time) for future projects estimates



Stage

QED

Quod Erat Demonstrandum

(Latin: Which Was to Be Demonstrated)