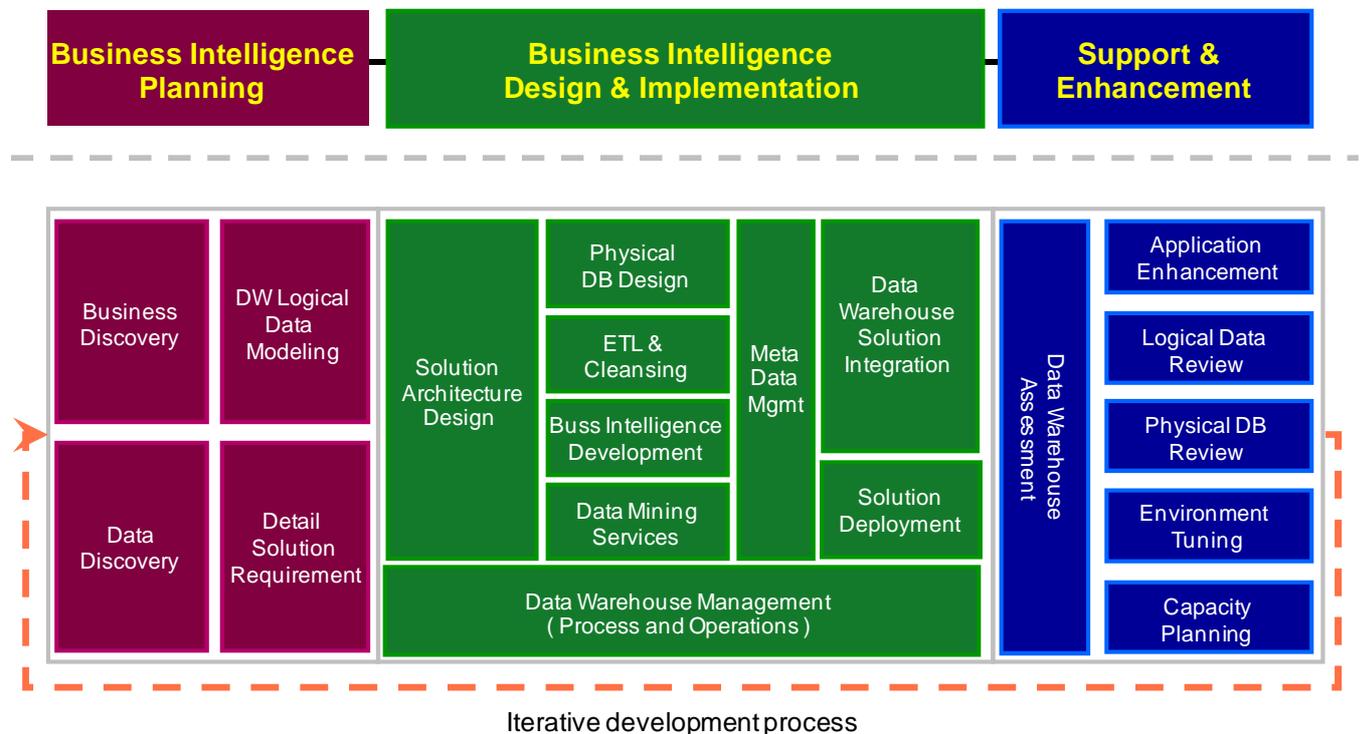# Knowledge Base Data Warehouse Methodology

Services for Data Warehousing Solutions

Knowledge Base's data warehousing services can help the client with all phases of understanding, designing, implementing, and maintaining a data warehouse. This assistance includes everything from exploration of the world of data warehousing, to identification of business opportunities that can be solved with a data warehouse, to the implementation and ongoing expansion of the data warehouse. These services are focused on getting reliable and consistent results from data.

Although there is a great deal of interest in creating data warehouses, a matching quantity of expertise is not broadly available to explain, design, build, and support them. With over 17 years of experience designing and implementing data warehouses that help release the power of detail data, Knowledge Base is in a unique position to help the client design and implement a successful data warehouse.

The experience of implementing data warehouses resulted in the definition of the Knowledge Base DW Solutions Methodology. The methodology allows for a controlled way of building and introducing a successful data warehouse. It describes all the steps required to generate the information out of the structured data. The methodology consists of four phases:

- Data Warehouse Strategy Development
- Planning
- Design & Implementation
- Support & Enhancement

Iterative development process

Data Warehouse Strategy Development

Data Warehouse (DW) Strategy Development is the starting point for Knowledge Base's DW Solutions Methodology since it sets the path for all ensuing data warehousing activities. Next, the Planning phase performs detailed analysis and design for a specific area of the business recommended by the DW Strategy Development. Once this analysis and design is completed, the Design & Implementation phase builds the actual data warehouse delivering business value. Once the data warehouse is up and running, the Support & Enhancement phase initiates on-going lifecycle maintenance processes. Also at this point, Knowledge Base's process is an iterative approach that enables the client to build an enterprise-wide data warehouse. DW Strategy Development creates an enterprise-wide strategy that recommends specific starting points. The Planning phase uses these starting points to narrow the investigation into a business objective that is valuable and can be implemented quickly. The Design & Implementation phase then constructs the data warehousing infrastructure and the requirements of this initial objective. Since the entire data warehousing process was started with an enterprise-wide view, the next business objective joins right into the existing structures with no expensive or time-consuming rework. DW Strategy Development service identifies to a client how a series of data warehouse projects will help their business. This is done by building five models of a client's business and then integrating these for a common comprehensive understanding.

- Business Information
- Business Function
- Organization Relationship
- Computer Platform Inventory
- Application Systems Flow Diagram

The result of a DW Strategy Development engagement is a recommendation on how to proceed with a data warehouse implementation and a Professional Services proposal for a Planning engagement.

Another significant benefit of the DW Strategy Development is that it can be used to quickly qualify or disqualify potential packaged decision support solutions. Using the Business Information Diagram, the client organization can quickly determine how well a packaged solution fits their business and what the scope of potential modifications would be.

The DW Strategy Development does not analyze business value or potential return-on-investment and, therefore, does not directly support the creation of a business case. ROI calculation is performed during the Business Discovery activity, which is the first step in the Planning phase. Rather, the DW Strategy Development determines which organizations, applications, systems, information, and processes have the highest immediate data warehousing feasibility. When the results of the DW Strategy Development and Business Discovery are combined, the client Project Sponsor will know what subject areas are both feasible and valuable.

The Organizational Model, Computing Platform Inventory, and Application Systems Flow components are completed and integrated before the Business Diagramming activity so that the client and Knowledge Base can identify desired attendees for the Business Diagramming Workshop. The integration of these three models determines:

- The business users who utilize specific application systems
- Their chain of management
- The IT people who support those application systems on various computer platforms
- Their chain of management

These key business users, IT support personnel, and their management will unquestionably be the prime contributors of business knowledge and data to any warehousing initiative and will probably be a benefactor as well. Therefore, the support of these people is critical to data warehousing success. Consequentially, all identified managers should attend at least the Data Warehouse Education component, with business and IT experts attending both the Education and Business Diagramming Workshops.

Planning

The Planning phase is the second step in Knowledge Base's DW Solutions Methodology. Knowledge Base believes that the best approach for data warehousing is an iterative approach where value is delivered quickly and each iteration integrates with existing functionality to produce an enterprise-wide view. Therefore, the Planning phase begins with the enterprise-wide view identified in the DW Strategy Development and continues to narrow focus until a scope is identified that can be implemented quickly. Furthermore, by starting with an enterprise-wide view, any product of the Planning phase, and subsequent implementation, can be easily expanded to include the next business area. Knowledge Base suggests using the Planning phase process for every new business area to be added to the data warehouse.

The following are the services in this phase:

- Business Discovery
- Detailed Data Analysis
- DW Logical Data Modeling
- DW Solution Readiness
- Visual Business Discovery

Design & Implementation

The Design & Implementation phase develops full-scale design and implementation plans and provides for construction of the data warehouse.

The following are the services in this phase:

- Data Mining Services
- DW Application Development
- DW Data Transformation
- DW Management
- DW Physical Database Design
- DW Solution Integration
- Metadata Management
- Solution Architecture Design

Support & Enhancement

The focus of the Support & Enhancement phase is on maintenance of the data warehouse and planning for expansion. Successful data warehouses grow rapidly in volume and usage. Changes can affect performance and sometimes the integrity of the data warehouse; therefore, expansion should be planned carefully.

The following are the services in this phase:

- Application Development
- Application Support
- Backup/Archive/Restore
- Business Continuity for DW
- DW Assessment
- DW Capacity Planning
- DW Environmental Tuning
- DW Logical Data Model Review
- DW Physical Database Design Review
- DW Software Implementation Services
- Enterprise System Support: Business Critical
- Enterprise System Support: Enhanced
- Installation Services
- Data Warehouse System Performance Management

Business Strategy Consulting

Business Discovery

The Business Discovery service provides an organized forum for prioritizing business strategies and objectives, and developing insights into meeting those objectives.

Knowledge Base will help build a company-wide consensus on the critical issues that are impeding the realization of key objectives. We will also show you how to use data to resolve those challenges and help you recognize new possibilities never before available. You will work with a team of experienced consultants who bring their knowledge of your industry, the Business Discovery process, and the power of detail data to your solution.

At the conclusion of the Business Discovery service, you'll receive a business impact report that prioritizes your critical issues. More importantly, you'll have an understanding of the value of resolving those challenges through improved data information and management tactics.

Planning

Detailed Data Analysis

This activity will assess the client's ability to provide the data necessary to populate the logical data model and, therefore, answer the business questions identified in the Business Discovery, or, provide the data necessary to support the chosen application. This assessment determines sources of data from operational systems, consistency and quality of that data, effort to reshape or transform this data into the physical data warehouse model, and rough estimates of volumes of data for the warehouse.

Planning

Data Warehouse Logical Data Modeling

Logical data modeling sessions, facilitated by an Knowledge Base expert, will help us identify your users' information requirements, and capture the data requirements, data definitions, and the business rules that govern the use of the data in your company. All information is put into an automated data modeling tool, providing quality input and ease of update for your data warehouse design.

Data modeling allows for more stable, yet flexible, database designs because modeling focuses on the data requirements of the business and yields a technology-independent way to structure the data.

Data Warehouse Solution Readiness

With Knowledge Base's Data Warehouse Solution Readiness Services, our experienced consultants will work with you to design a data warehouse solution that meets your specific needs. We'll help you explore all related critical success factors and identify any important issues that must be addressed prior to the implementation process. More importantly, you'll receive recommendations on how to best remedy these challenges.

The Data Warehouse Solution Readiness Services will take you through a comprehensive six-part assessment, which includes the following activities:

- Technology Assessment
- Data Assessment
- Function Assessment
- Change Assessment
- Education Assessment
- Support Assessment

Technology Assessment - The purpose of the Technology Assessment is to ensure that there are no technical issues that could prevent or delay implementation of a data warehouse.
We'll interview representatives throughout your organization to ensure that the proposed solution is acceptable to all user groups. We'll also assess your readiness for a client/server solution by evaluating your current hardware, software, and network solutions.

Data Assessment - Through the Data Assessment, we'll evaluate your existing data structures and characteristics in light of your solution requirements. We'll review existing data models for completeness and accuracy. And, if any data elements are missing, we'll help you develop plans to acquire them.

Function Assessment - The Function Assessment identifies information technology and business processes that will be impacted by the solution's implementation. We'll ensure that the solution fully supports these processes and that everything works in concert to meet your needs.

Change Assessment - Because people ultimately make or break a solution, we'll work closely with your user groups to determine how they might be affected. Working as a team, we'll explore the solution's impact on both technical and business users. We'll also evaluate their inclination to accept and implement changes. Upon completion of the Change Assessment, you'll receive a complete report of our findings and associated recommendations.

Education Assessment - The Education Assessment is vital to identifying and satisfying potential educational needs. We'll work with your staff to ensure that all members of the solution implementation team are properly prepared, and we'll assist you in developing an end-user personnel training plan.

Support Assessment - Through the Support Assessment, we'll identify support procedures that need to be developed or changed due to the introduction of a data warehouse into your business. You'll receive a detailed support plan that outlines all of our findings and recommendations. Knowledge Base's Data Warehouse Solution Readiness Services are based on more than a decade of experience in building data warehousing solutions. We have helped companies around the world, in nearly every industry, design data warehouses that significantly improved their information management capabilities.

Planning

Visual Business Discovery

Visual Business Discovery focuses on revealing practical, information-based solutions to questions that an organization is facing. The emphasis is on business issues rather than technology and the objective of the Business Discovery is to gain consensus on key business issues. The output is a prioritization of business questions, quantifiable benefits to having these answered, and an analysis showing the positive impact on the business "bottom line."

The Visual Business Discovery process provides an interactive and proactive forum where Knowledge Base team members engage with a team from the client. This combined team will define and prioritize business strategies and potential return from a data warehouse solution implementation in the form of a Business Improvement Opportunity (BIO). The BIO is a very effective consulting technique used to consistently outline the strategic and tactical elements of the data warehouse solution. This process provides a vehicle for key decision-makers within the client organization to prioritize, articulate, and level-set strategic business strategies and the data warehouse solution required to improve the client's execution of the strategies.

All relevant information developed during this four to six week engagement is provided in a visual model that will clearly describe the interrelationships of:

- Selected business strategies
- Business analysis types required by the strategies
- Business questions that should be enabled by the data warehouse
- Business actions that can be taken or more effectively executed based upon the data warehouse solution
- Projected business value or benefit of those actions

Design & Implementation

Data Mining Services

Knowledge Base's Data Mining practice provides a combination of services and products that deliver world-class solutions to our clients. Our signature mining engagements have the added advantage of giving our clients new core competencies in data mining through on-the-job knowledge transfer as well as educational programs.

We have experience developing solutions across many industries, including banking, airline, telecom, and retail through our partner Teradata Corporation. Our knowledge and experience in enterprise data mining brings value to our clients' Data warehouse.

Design & Implementation

Data Warehouse Application Development

The Application Development service provides the design for specific applications and the query interface required by the data warehouse solution. The approach to designing a solution that enables user access to the data warehouse includes an iterative definition and prototyping of the desired applications. This service requires the consultant to work closely with the end user community to define the type of access required (ad hoc or planned), possible access methods, tools for development and access, report look and feel, and testing processes to ensure quality.

The result of this design service includes a working prototype of the applications, specification of the technical requirements to meet the design specification, recommended design laboratory and development tools to support implementation, and development and implementation plans for the required applications.

The Application Development service also implements applications or the query interface for a data warehouse solution. The service uses the prototypes, specifications, recommended tool sets, and other outputs of the application design service to develop and validate the "applications" that allow end users to get the required data and information they need to perform their business functions.

Application Development provides both the tools and programmed applications that access, transform, and represent to the user the data that enables his/her analysis and decision making. These applications and tools provide collection, analysis, and presentation of information in a way that is easy to use with graphical user interfaces. These applications allow both predefined and ad hoc analysis of data. Training and documentation are included with the delivery of the applications and access tools to ensure that new users can quickly and fully realize their benefits.

Design & Implementation

Data Warehouse Data Transformation

This service designs the process and develops the utilities and programming that allow the data warehouse database to be initially loaded and maintained. The service locates, extracts, conditions, scrubs, and loads data onto the data warehouse platform. The physical database design must be available before loading can be performed. Included is the operational planning that allows the reloading or incremental loading of the data warehouse on a periodic basis.

Design & Implementation

Data Warehouse Management

Data Warehouse Management is an umbrella service that implements the data, network, systems, and operations management procedures necessary to successfully manage a data warehouse solution environment.

Included are data maintenance routines to update, load, backup, archive, administer, and restore/recover data, ensuring consistency and compatibility with in-place procedures. Also included is identification of work group databases that need to be updated from the data warehouse and the procedures required to do the updates.

Procedures are also implemented for application version control, hardware and software maintenance, error reporting, and other management tasks.

Operations management looks at the operational procedures that affect the solution environment and recommends changes to meet the customer's needs. Design areas include: archive procedures, change control procedures for hardware and software upgrades, application version control, report logging, and preventative maintenance.

Design & Implementation

Data Warehouse Solution Integration

Data Warehouse Solution Integration is a central service for completing the implementation of the data warehouse - putting it all together. This service combines the requirements, methods, and output from other Knowledge Base services to create a uniquely integrated data warehouse. This service assures that the transformed data is loaded into the database, where it can be utilized in various applications and accessed by the users.

Design & Implementation

Metadata Management

This is the management of the client's metadata. Knowledge Base will assess client's requirements for metadata. Then, we will design an appropriate metadata repository database and will integrate it with the data warehouse using Knowledge Base's Meta Data Services software. Knowledge Base will provide training on the use of the metadata repository.

Design & Implementation

Solution Architecture Design

Solution Architecture Design will address issues related to integrating the project into your IT infrastructure. Appropriate strategies, standards, and interfaces are defined to get data into the data warehouse, analyze data in the data warehouse, and get data from the data warehouse. Architectural decisions are based on the expected business usage of the data warehouse to identify the most appropriate technical designs.

Support & Enhancement

Application Development

The Application Development service provides the design for specific applications and the query interface required by the data warehouse solution. The approach to designing a solution that enables user access to the data warehouse includes an iterative definition and prototyping of the desired applications. This service requires the consultant to work closely with the end user community to define the type of access required (ad hoc or planned), possible access methods, tools for development and access, report look and feel, and testing processes to ensure quality. The result of this design service includes a working prototype of the applications, specification of the technical requirements to meet the design specification, recommended design laboratory and development tools to support implementation, and development and implementation plans for the required applications.

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Hardware and Software Maintenance and Support Services

Application Support

Knowledge Base's Application Support offer is available for software products sold by Knowledge Base that have been developed by Knowledge Base or a third party. This includes any customization to the software product or custom code or extensions to the software product that is performed by Knowledge Base or a Knowledge Base authorized agent.

Application Support consists of core and optional service features that are delivered remotely to resolve errors encountered by you within the software product, the customization or the documentation.

Core features include:

- Local business hours of coverage for problem resolution on the current release and version of the software product and one version back
- Remote direct phone contact for problem resolution
- Guidance in locating solutions to known problems
- Temporary workarounds
- Code-level patches
- Business Hours problem reporting
- Access to software maintenance releases and patches
- 24-hour online access to known problems and resolutions through Knowledge Base @ Your Service - Support Link
- Customer-assigned call priorities

- Development of four change plans annually for implementing software maintenance releases

Optional features include:

- 7x24 hours of coverage
- Direct telephone access to a Technical Support Specialist

Application Support is recommended for all software product(s) associated with an Knowledge Base Data Warehouse solution.

Application Support is not available on the customization work only. If customized, in addition to supporting the software product, the customization must also be supported.

Support & Enhancement

Backup-Archive-Restore

Knowledge Base's Backup-Archive-Restore Bundles provide a complete storage solution to meet the needs of your Database / UNIX Data Warehouse Solution environment. Each bundle is a combination of hardware and software components and services. The services include a Backup-Archive- Restore Audit to determine data volume and backup requirements, and to analyze existing processes, procedures, and environments. The second phase is Planning and Design where, based on the requirements identified in the Audit, we architect and document a solution for you. The final phase is Implementation. Knowledge Base installs and configures the hardware and software purchased as part of the Backup-Archive-Restore Bundle. We also work with your staff to teach them what they need to know to take full advantage of the new environment and ensure your valuable data is available when you need it.

Backup-Archive-Restore Bundles provide the following value:

- Automation of the storage process with new technology
- Avoidance of catastrophic data loss
- Improved data accessibility
- Increased operator effectiveness during backup/restore activities

Support & Enhancement

Data Warehouse Assessment

Data Warehouse Assessment provides clients with a life-cycle approach of continuously measuring the technical optimization of the data warehouse (or just an application). As part of the initial data warehouse engagement, it is ideal to round out a cycle of Design & Implementation services to prove and quantify the success of the implementation. It is equally suited to be executed three to six months after the data warehouse has gone into production or as the first service to be engaged as the start of a new implementation cycle. At a minimum, every account that has a substantiated growth potential is a target client.

Data Warehouse Capacity Planning

This service helps clients plan for the expansion of their data warehouse solution. Expansion includes the addition of applications, users, data, remote locations, and operations, among other drivers of change.

Any of the above additions could affect the capacity and performance of the data warehouse environment. Proactive planning for changes will allow the user community to continue to work with limited or no disruption.

Data Warehouse Environment Tuning

This service is for clients with an existing production data warehouse environment. This service would typically be engaged when performance problems are encountered or perceived. A detailed analysis needs to be done to pinpoint the source or sources of the problem. This analysis will look at the network, applications, users, database structure, system utilization, and other areas. Detailed analysis is necessary to accurately tune the environment.

Once the analysis is completed, recommendations are presented to resolve performance issues.

Data Warehouse Logical Data Model Review

The Data Warehouse Logical Data Model Review service provides support and confidence for clients who want to use their own staff for some of the design and implementation needs. An Knowledge Base consultant reviews the new requirements with the user, along with his/her model construction, and offers analysis and suggestions for improvement. This analysis is based on Knowledge Base's experience in the definition and construction of data warehouse solutions. One potential scenario would be for Knowledge Base to perform the design and implementation services with participation from the client during the first project iteration. This would be followed by Knowledge Base providing review services for subsequent projects.

Reviews examine and validate the current logical model design for correctness of technique and the ability to meet performance, quality, and business requirements.

Data Warehouse Physical Database Design Review

The Data Warehouse Physical Database Design Review provides support and confidence for clients who want to use their own staff for some of the design and implementation services. An Knowledge Base consultant reviews the new requirements with the user, along with his/her design, and offers analysis and suggestions for improvement. This is based on Knowledge Base's experience in the definition and construction of data warehouse solutions. One potential scenario would be for Knowledge Base to perform the design and implementation services with participation from the client during the first project iteration. This would be followed with Knowledge Base providing review services for subsequent projects.

Data Warehouse Software Implementation Service

Knowledge Base's Data Warehouse (DW) Software Implementation Service provides a cost-effective and rapid deployment from one software version to the next. With a comprehensive change control process, proven migration planning techniques and sophisticated upgrade tools, Knowledge Base will ensure a smooth software implementation with minimal downtime.

An Knowledge Base customer engineer confirms that all operating system software is configured to factory defaults or to your specifications and is current with the latest release levels. A systems acceptance checklist is used to ensure the customer engineer completes every necessary software installation task, including performing a successful logon from a client, achieving connectivity between the host and existing channels, and completing software functionality testing.

The Software Implementation Service provides the following value:

- Formal change control meetings, before and after the upgrade
- A comprehensive change control plan
- Verification of hardware, firmware and software release levels
- Data conversion, as appropriate

Data Warehouse System Performance Management

Knowledge Base's System Performance Management provides the people, processes and tools to help you manage your Data Warehouse. Our goal is to understand the rigors and demands of your business and take advantage of available efficiency opportunities. During a System Performance Management engagement, database and operating system parameters are reviewed and validated, system traffic is analyzed against capacity, and workflow processes are carefully reviewed for bottlenecks or inefficiencies. Improvements unique to your business are identified, presented, and implemented.

Throughout the engagement, the Knowledge Base consultant mentors members of your IT staff, providing knowledge on your unique environment that may enable them to improve the design of your Data Warehouse and applications. The final deliverable is a written report, presented in an on-site review, outlining specific performance improvements.

Knowledge Base's System Performance Management provides the following value:

- More time for your staff to focus on addressing user requirements
- Identification of potential problems before they impact your environment
- Routine pulse checks as your data warehouse grows
- Major upgrades or expansions
- New applications
- Increasing number of users and/or queries
- Identification of potential problems before they impact your environment
- Better understanding of your Data Warehouse environment
- Ability to make more informed decisions, resulting in a stronger competitive position