

# MANAGEMENT TECHNOLOGY

MANTECH INTERNATIONAL CORPORATION

managing technology

for a changing world



SECURE SYSTEMS  
& INFRASTRUCTURE



INFORMATION  
TECHNOLOGY



SYSTEMS  
ENGINEERING



# ***Supra to DB2 Conversion Solutions***

***prepared for:***

***Lightyear Consulting***



# ManTech's Mission Statement

To provide clients with the skills and tools that facilitate the renovation of their application portfolios, allowing them to retain existing investments while redeploying to more modern hardware and software platforms.

# ManTech Summary

GDF ↓ .15 HJK 1.25 ↑ RTY 1.23 IDP .05 ↑ BNM 12.0 ↑ XCV .20 ↑ QEW ↓ .65

**Established in 1968**

**4,000 Employees  
Worldwide**

**120 U.S. Locations  
30 International  
Locations**

**Over \$600 Million  
in Annual Revenues**

- **Publicly Traded Professional and Technical Services Firm**
- **Provides Technical, Engineering, Scientific, Analytical, Logistics, Software Development, Program Management, Publications, and Support Services**
- **Worldwide Professional and Technical Resources**
- **Corporate Headquarters in Fairfax, VA**
- **Current project backlog of over \$1 Billion**

# ManTech Partnerships



## IBM Premier Business Partner for Conversions

- Called upon by IBM to complete database/application conversions for their clients
- Direct connection to the IBM database labs

## Oracle Business Alliance Partner



- Recognized by ORACLE for conversion/development expertise

## Sun Business Alliance Partner



- Sun goes to partner for Legacy to Distributed platform migrations

## Microsoft Certified Solution Provider



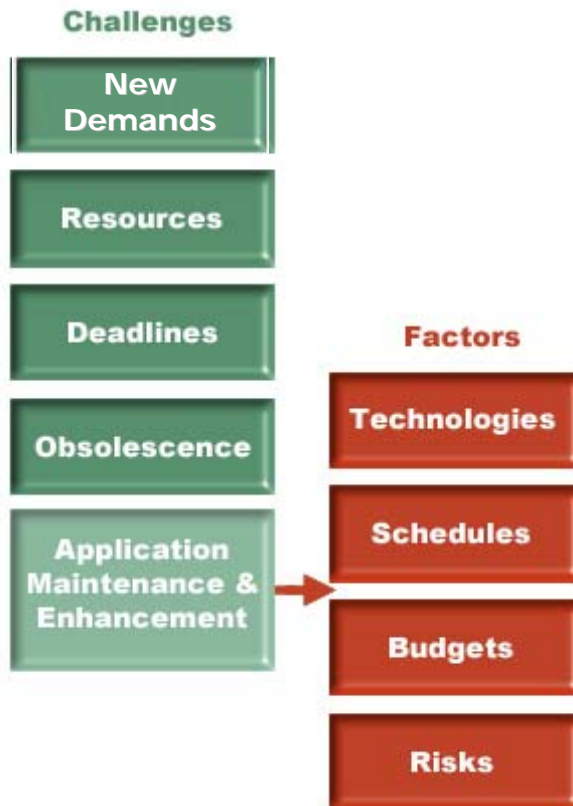
- Identified by Microsoft as a “go-to” business partner for conversions



## **Partial Customer List**

- H&R Block
- Fidelity Investments
- Univ. California, Berkeley
- Merrill Lynch
- BC/BS of North Carolina
- **Northwestern Mutual**
- City of Leiden
- **Publishers Clearing House**
- Johns Hopkins University
- Aurora Health Care
- Congress Financial
- Southwestern Bell Corp
- Mercedes Benz
- JC Penney
- AT&T Canada
- Ohio School Employee Retirement Services
- DaimlerChrysler
- Kredietbank
- **Allied Van Lines**
- **Brown Shoe**
- United Health Care
- Citibank
- **Department of Defense**
- Paine Webber
- JP Morgan
- Prudential
- American Express
- State Street Bank

## Application Maintenance & Enhancement



Legacy Application costs are rising **25% / year**

- ✓ Increase in maintenance and licensing fees
- ✓ Increase in application maintenance costs (added complexity)
- ✓ Increase resource support costs (lack of resources)
- ✓ Increase purchase of required add-on products



## Partner with ManTech to:

Develop and Implement a Solutions Roadmap that accommodates Technical, Schedule and Budget concerns

- Enable a strategy that preserves legacy code investment, existing business logic/processes and accommodates new business needs
- Leverage proven processes and tools
  - Risk Avoidance
  - Proven expertise
  - Measurable ROI
  - Guaranteed Performance

*"We were more than happy with ManTech involvement in the project (largest IT project deployed). We knew very early on in the process that their integrity was unquestionable and that feeling has only strengthened during the partnership."*

--Philippe Paquay, CIO  
Kredietbank Luxembourg

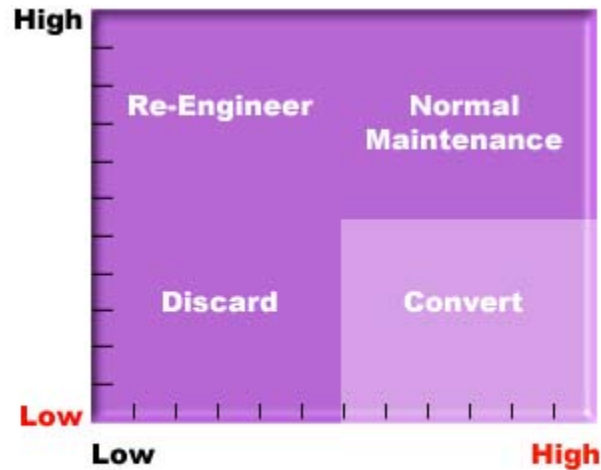
*"No one knows what the system requirements will be in five or ten years time. But, whatever they may be, we now have a flexible and scalable system delivered by MSSC that will grow, and allow us to meet any new challenges!"*

--Paul Dubb, Head of IT, Leiden Local Authorities



The ratio of technical to business process soundness for an application determines the method of change.

**Technology Utility –**  
Technology Capabilities or  
scalabilities within  
applications



**Business Process Utility –**  
Business Process soundness or  
validity

## Conversion

- Best blend of cost, risk, time, and impact on business processes
- Provides 80% of the benefits of re-engineering at 20% of the cost

# A proven roadmap for project success

← **Quality Assurance** →



- Budget and Acquisition Planning
- Quantify ROI / TCO
- Validate Technical Strategy
- Define Solutions Roadmap

- Define new relational model
- Incorporate Organization's standards
- Incorporate organization's prioritize
- Define and establish required modernized environment
- Select testing tools

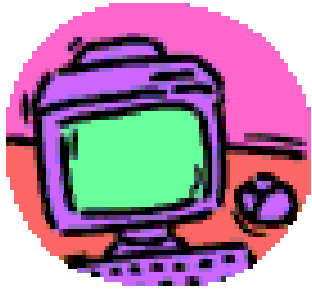
- Convert to new DB structure
- Make modifications based on input from team and results
- Reconvert until satisfied with results

- Convert code
- Compile code
- Convert and verify data
- Transfer code and data to test environment

- Implement converted code and test data
- Parallel Test
- Reconvert and retest as necessary

- Implement converted code and test data
- Acceptance Test
- Reconvert and retest as necessary

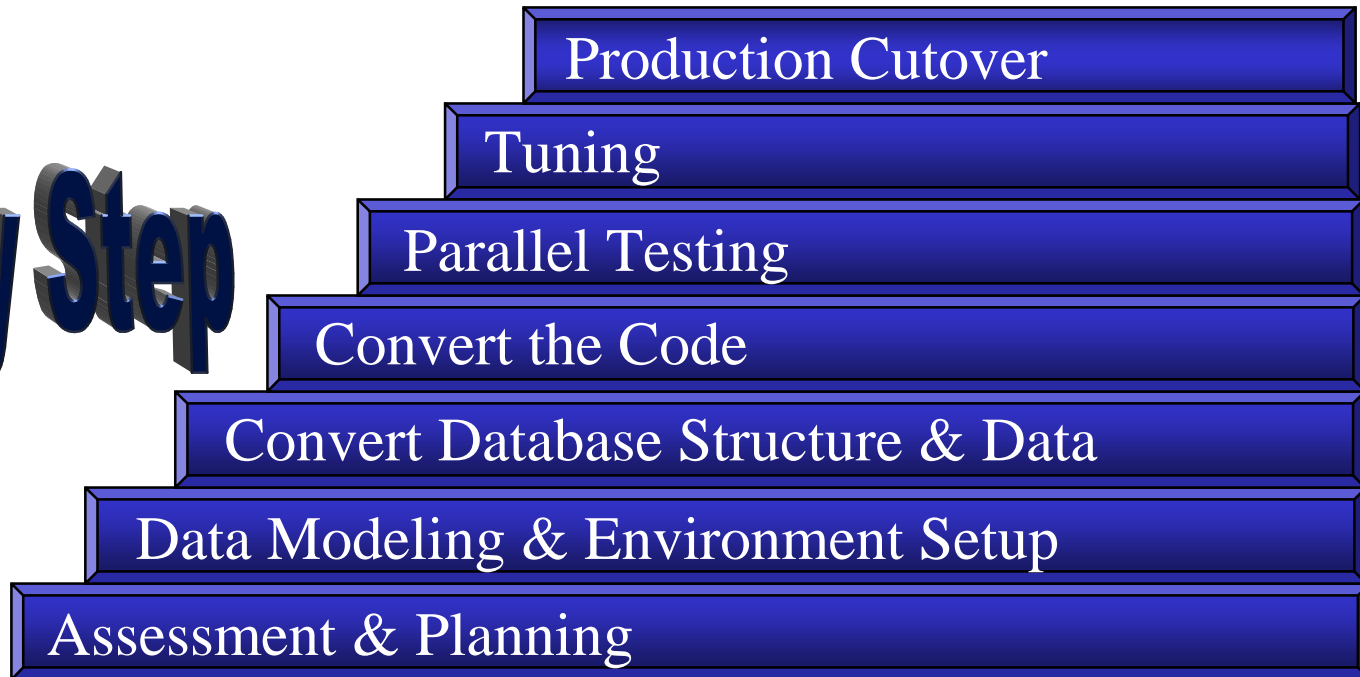
← **Project Management** →



- Identify Business Value;
- Show Cost Savings;
- Quantify new or additional Revenue Gains;
- Show multi-year Cash Flow;
- Generate Net Present Value (NPP);
- Generate Internal Rate of Return (IRR);  
and
- Demonstrate Sensitivity and Scenario  
Analysis

# *Conversion Methodology is Key*

**Step by Step**



# Assessment & Planning

- **Conversion Assessment**

- Feasibility study
- ROI
- Project Plan & Scope
- Co-existence Plan
- Business Requirements
- Fixed Priced Bid

Assessment & Planning

# Data Modeling

## ▪ Data Modeling/Design

Determines Quality of Resulting System

- ❑ Normalization -vs- De-normalization
- ❑ Data Typing
- ❑ Identification of Keys
- ❑ Data Transformation
- ❑ Physical Database Design

## ▪ Environmental Setup

- ❑ Create staging libraries
- ❑ Create Test, User, Production environment

**Data Modeling & Environment Setup**

**Assessment & Planning**



# Data Conversion

- Convert Database Structure

- Create SQL DDL
- Deploy physical objects

- Convert Data

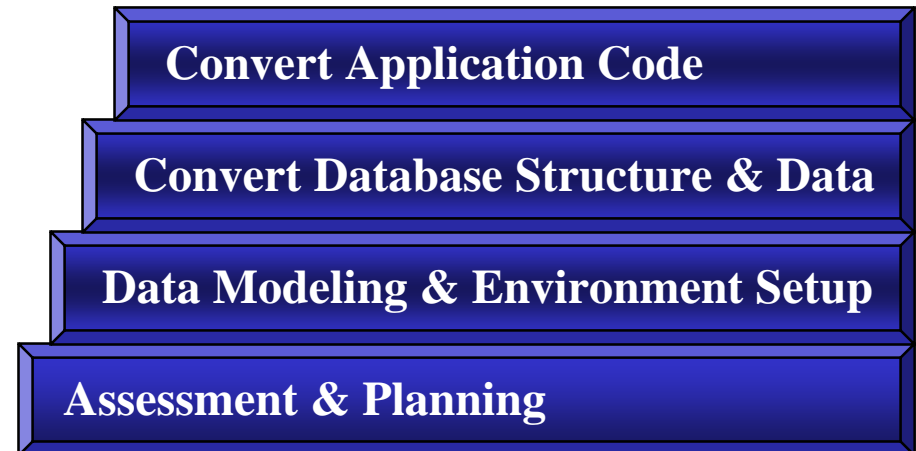
- Execute data extraction
- Complete data transformation
- Execute load utilities
- Data Cleansing



# Application Conversion

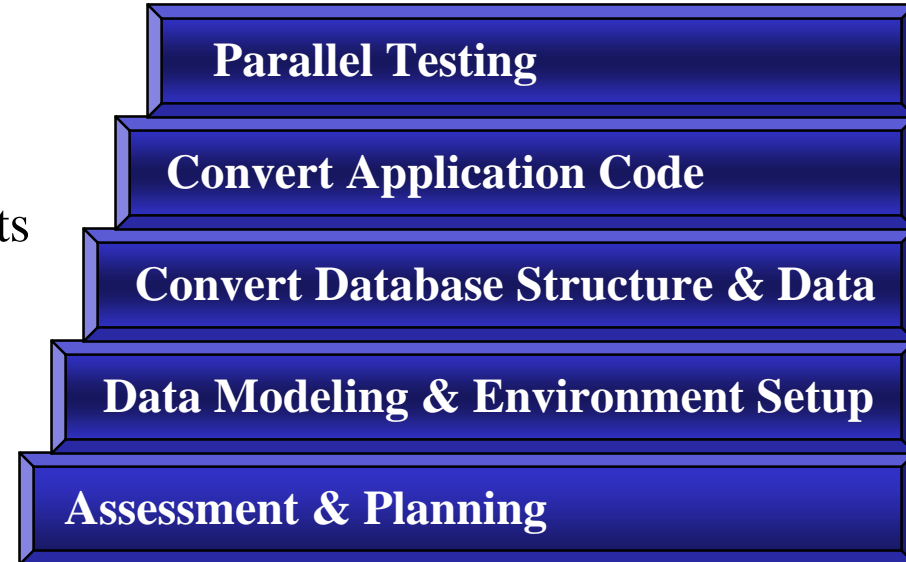
## ■ Convert Applications

- Application Conversion
- Application Language Translation
- Application Reengineering



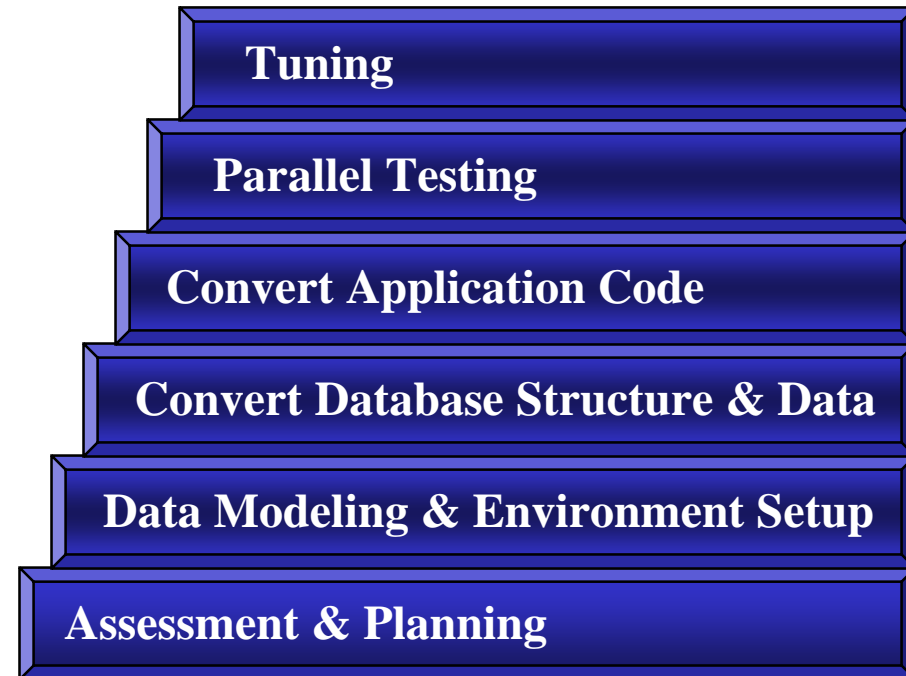
# Testing

- Unit Testing
  - Ensures functional integrity of unit
  - Ensures operational efficiency
- Integration Testing
  - Tests operation of converted objects with other objects
  - Ensures operational efficiency
- Parallel Testing
  - Ensures implementation readiness
  - Ensures operational efficiency



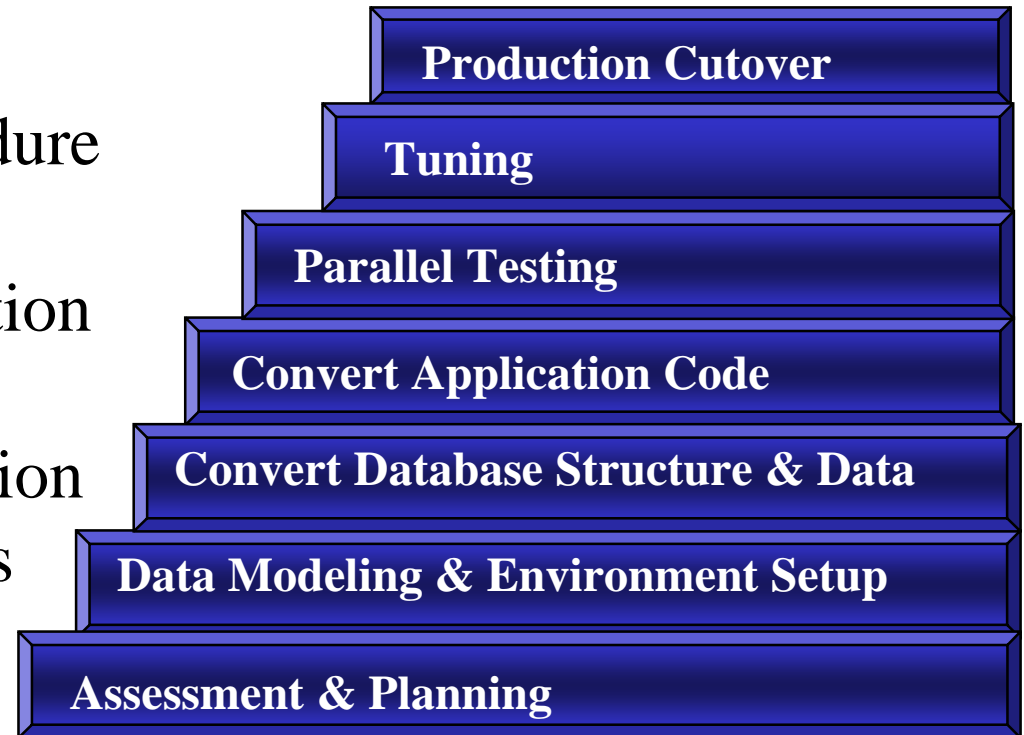
# Tuning

- System Performance Tuning
  - Systems and Application
  - DBAs tune the new DBMS
  - Tune SQL / CICS connections

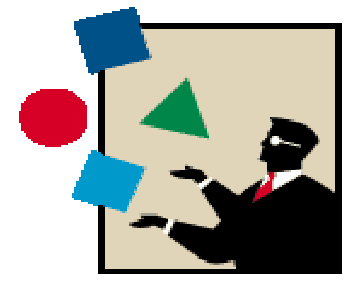


# Production Cutover

- Requires careful planning
  - Prepare detailed procedure
  - Conduct dry run
- Non-invasive Implementation
  - Downtime
  - Off-hours implementation
  - Verification procedures



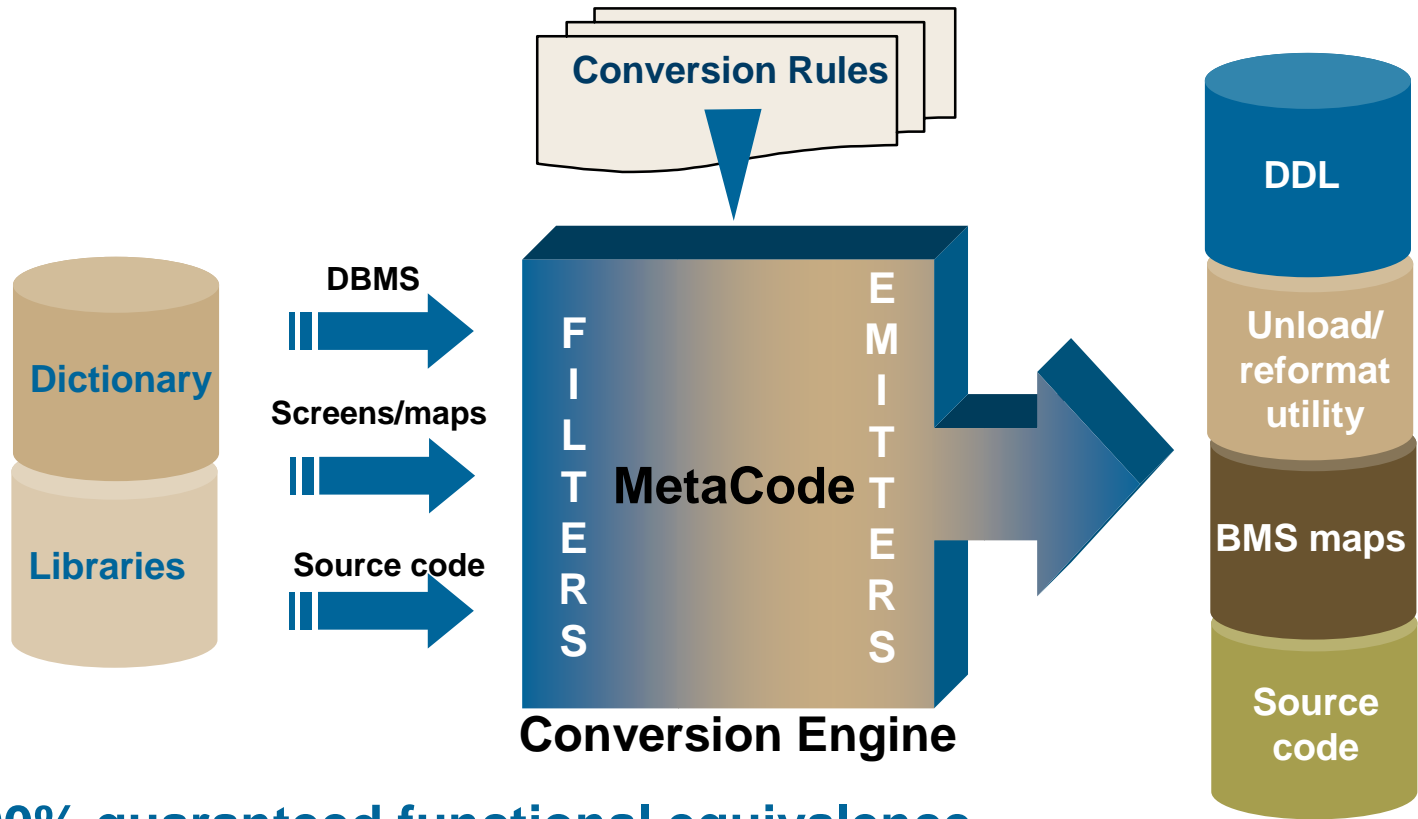
# Project Management



- ManTech’s Conversion Methodology incorporates standardized Project Management
- Standardized Project Plan
- Implementation of a Standard QA Procedure
  - Peer Reviews
  - Senior Technical Resource assigned as QA Manager
  - Formal Management Reviews with Client Project Management



# SQL Conversion Workbench



**100% guaranteed functional equivalence in source code conversion, plus DDL and unload/reformat utilities**

# Addressing Technical Issues – SQL Conversion Workbench Tool Objectives

- SQL Conversion Workbench Automatically Converts your Code
  - The the resulting code is easily Maintained and Understood!
  - Accurate conversion algorithms
  - Maintainable conversion algorithms

# Addressing Technical Issues – Performance

- Great Performance is No Accident
- Addressed at each stage
  - Optimized database design and mapping
  - Quality SQL usage
  - Access Plan Review
  - Attention during testing
  - Tuned SQL and CICS-SQL connections

# Addressing Technical Issues – Database Mapping - Flexibility

- Supra File Conversion
  - Primary files used as navigation entities only may be removed/consolidated
  - Data items may be added to emulate chain positioning/ordering or direct refer processing, plus ROWID use
  - Coded related files split to separate tables
  - Foreign keys support primary/related key relationship
  - Indexes added to support control key/linkpath access strategies



# Addressing Technical Issues – Database Mapping - Flexibility

- Views
  - Navigation supported by generated SQL via joins or multiple SQL statements
  - View integrity coding moved to data model (foreign keys/triggers)
  - Views not used in generated target code

# Addressing Technical Issues – Database Mapping - Flexibility

- Decisions made carry through to other tasks
  - DDL
  - Data Mapping
  - Data migration utilities
  - SQL replacement
  - Program conversion



## Resulting Data Model

- Not a complete from-scratch redesign, but relationally-based and usable with external query tools
- Seek to limit application impact but provide a usable model for new applications and reporting
- Provide unique identifiers and quick SQL access

# Addressing Technical Issues – Data Mapping FAQ's

- Integrity software for data migration
- Customization of DDL
- Coded record/data area mapping solution
- Root/synonym chains
- Chain clustering
- How to retain functional data linkpath ordering requirement?
- Supra access by refer
- How can we efficiently move the data?

# Addressing Technical Issues – Automated Code Conversion FAQ's

- Mantis conversion options
- Supra file physical sweeps (outside PDM)
- Views that update multiple files
- RQLOC processing
- FSI/PDM status mapping
- ASI mapping
- ADDVB, ADDVA, ADDVC, ADDVR - Chain ordering logic
- READR, READV
- READD
- Related chain searches
- Single task processing/tuned environment descriptors
- Locking strategies
- View positioning currency in pseudo-conversational CICS
- RDM MARK/Navigation
- Can we run a transparency solution?
- Phased or Big Bang approach

# Addressing Technical Issues – Rollback and Recovery

- Recovery processing and scheduling changes
- Changes to disaster recovery

# Addressing Technical Issues – Application Look and Feel

- Externally everything is the same
- Screen presentation - no change
  - Screen layouts
  - Position of elements
  - Use of function keys

# Addressing Technical Issues – Batch Programs Job Control

- JCL conversion automated
  - Removes or leaves Supra references
    - Supra Libraries
    - CSIPARM
  - Substitutes or adds SQL DBMS references

# Why DB2?

- OS/390 – z/OS
  - Optimization of input/output (I/O) advances, such as linear Virtual Storage Access Method (VSAM) data sets
  - Multi-page asynchronous I/O, with advanced I/O optimization strategies including I/O read-ahead and parallelism
  - CPU parallelism within the database manager for individual SQL requests
  - Hardware-assisted sorting
  - Direct Resource Access Control Facility (RACF)-integrated security interfaces and management
  - Robust, high-volume internal threading (multiple Task Control Block/Service Request Block (TCB/SRB)) architecture
  - Virtual storage constraint relief via multiple address spaces and data spaces to support Environmental Descriptor Manager (EDM) pool, buffer pool, and large objects
  - Use of Parallel Sysplex to optimize clustering using DB2 data sharing on the 390 architecture via low-overhead, high-performing hardware-assisted locks.
  - SQL enhancements such as stored procedures, user defined functions, triggers, scrollable cursors, etc.
  - System Managed recovery

# Why DB2?

- Distributed Platform
  - Scalable (SMP and MPP), extendable architecture including a shared-nothing partitioned option for OLAP processing with many Business Intelligence extensions (Cube Views, MQTs, MDC, etc.)
  - SQL enhancements such as stored procedures, user defined functions, triggers, scrollable cursors, etc.
  - Tight integration with DB2 on mainframe platform
  - Tight integration with distributed OSs including Windows, various Unix, various Linux
  - Increased availability via online utilities and dynamically configurable parameters similar to mainframe availability implementation
  - Federated support (Use DB2 SQL to access other DBMS vendor data)
  - Strong Java and .NET integration
  - System managed recovery



# Addressing Technical Issues – We deliver solutions

- Highly automated and accurate
- Transparent to application users
- Flexible to deliver a tailored solution
- Proven methodology backed by experience
- Maintainable code for the future
- Strong conversion performance references

