HP e3000 Database Migration

Finding YOUR migration path

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Agenda

- Options available to you
- e3000 migration overview
- Application migration
- Database migration
- Special topics
- How Speedware can help

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Corporate Profile

- Established in 1976
- Publicly traded since 1994 (TSE:SPW)
- Profitable - $16M in revenue
- 3000+ Clients world-wide
- A world-wide network of distributors covering over 35 countries
- We have helped many customers migrate their applications and databases
- HP Platinum Transition Partner

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Overview of options available to you

Overview of options available to you

- ## Stay on e3000
  - Solutions for continued support
  - Solutions for continued maintenance/hardware upgrades
  - Different solutions
    - MPE emulators
    - MPE open source
    - Open MPE movement

Overview of options available to you

- Move to Unix or PC
- Applications decisions
  - Replace
  - Re-develop (re-write)
  - Migrate
  - A combination

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Migration overview

Migration overview

- Definition
  - Move to another platform and keep your applications

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Migration overview

- Components of an e-3000
  - Hardware
  - OS
  - Applications (3GL, 4GL, XL libraries)
  - Databases and files
  - Maintenance and misc. utilities

Analyze current system

- CPUs, users, connections, databases, disk space
- Applications (critical, non-critical, purchased)
- 3rd party vendors for all apps and tools
- Types of languages
- User interface
- Data entry screen tools
- Development tools
- Operational tools
- Critical state preservation

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The Hardware Platform

- UNIX vs Windows
- Sticking with HP or considering other vendors?

HP9000 (HP-UX) IBM RS6000 (AIX) SUN (Solaris)	HP NetServer IBM NetFinity Dell (NT / 2000 / XP)

- Which platform is best supported by the majority of my vendors?

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Migration overview

- Decide which components you need to keep
- Investigate components to be migrated
- Investigate components to be replaced
- Investigate components to be re-written

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Application Migration

General issues

- Migrate, replace, re-write, combo?
- Keep same User Interface or Improve
- Keep same functionality of improve

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Third Generation languages

- Types
  - Cobol, Fortran, C, SPL, Pascal, RPG, BASIC
- New platform support?
- Adapting your applications
  - Migration engines
  - Manually
- Execution engines
  - Emulators
  - API mappers

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OS specifics

- CI commands
- File system access
- JCL
- Spoolfiles
- File equations
- Etc.

Fourth Generation languages

- Speedware/4GL
- HP Transact (end of life)
  - Speedware migration solution
- Cognos Powerhouse (end of life)

Executable Libraries (XL)

- Proprietary name but general concept
- Used to "call" sub-routines or programs stored in libraries
- Unix has the equivalent with Shared/Archived Libraries
- Windows has the equivalent with DLLs

Database Migration

Overview

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Database migration

- Types
  - TurboImage
    - Omnidex, Superdex, TPI, others
  - Allbase
  - KSAM
  - Flat (circular, msg, RIO, etc.)

POP QUIZ

- What database technology are you using?
  - Image
  - Omnidex
  - Allbase
  - Ksam
  - Other

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Overview

- Most popular databases used do not exist on Unix or Windows

- Migration really means conversion

- Years of experience to learn from

TurboImage overview

- History
- Strengths
- Weeknesses
- Unique features
  - Dsets and Items
  - Master/Detail
  - Keys
  - Migrating secondaries, etc.
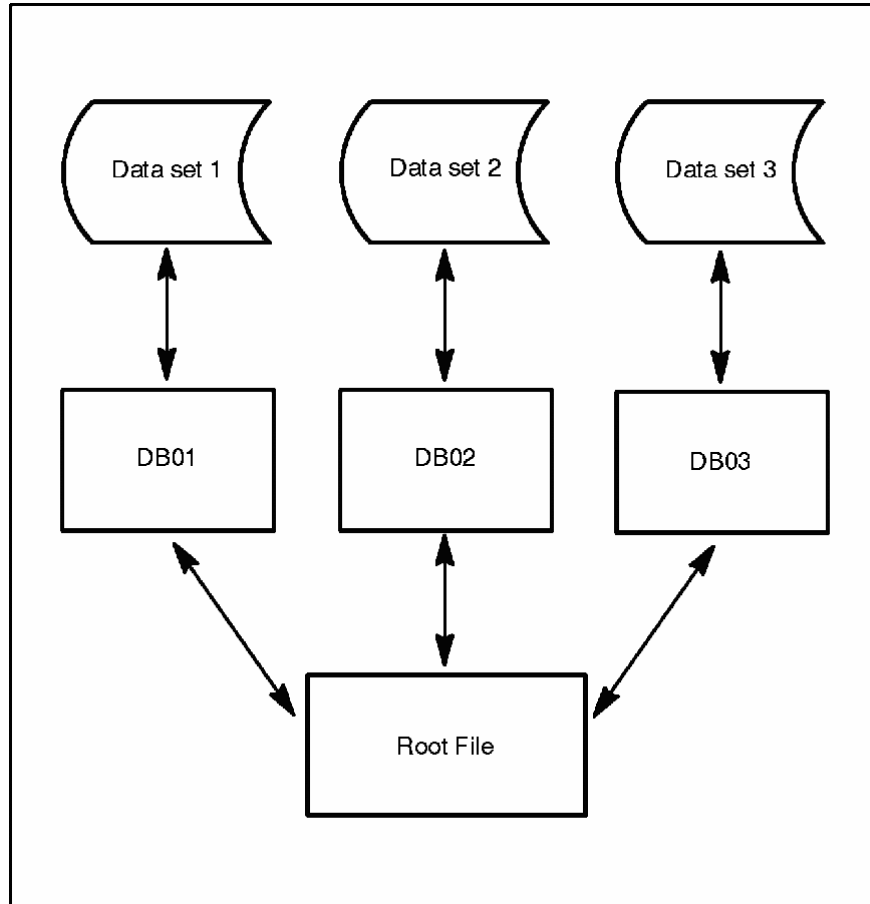- 3rd party Indexing

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Specific concepts

- Network topology
- DBSCHEMA
- DBUTIL
- Free
- Stable, Efficient, trustworthy

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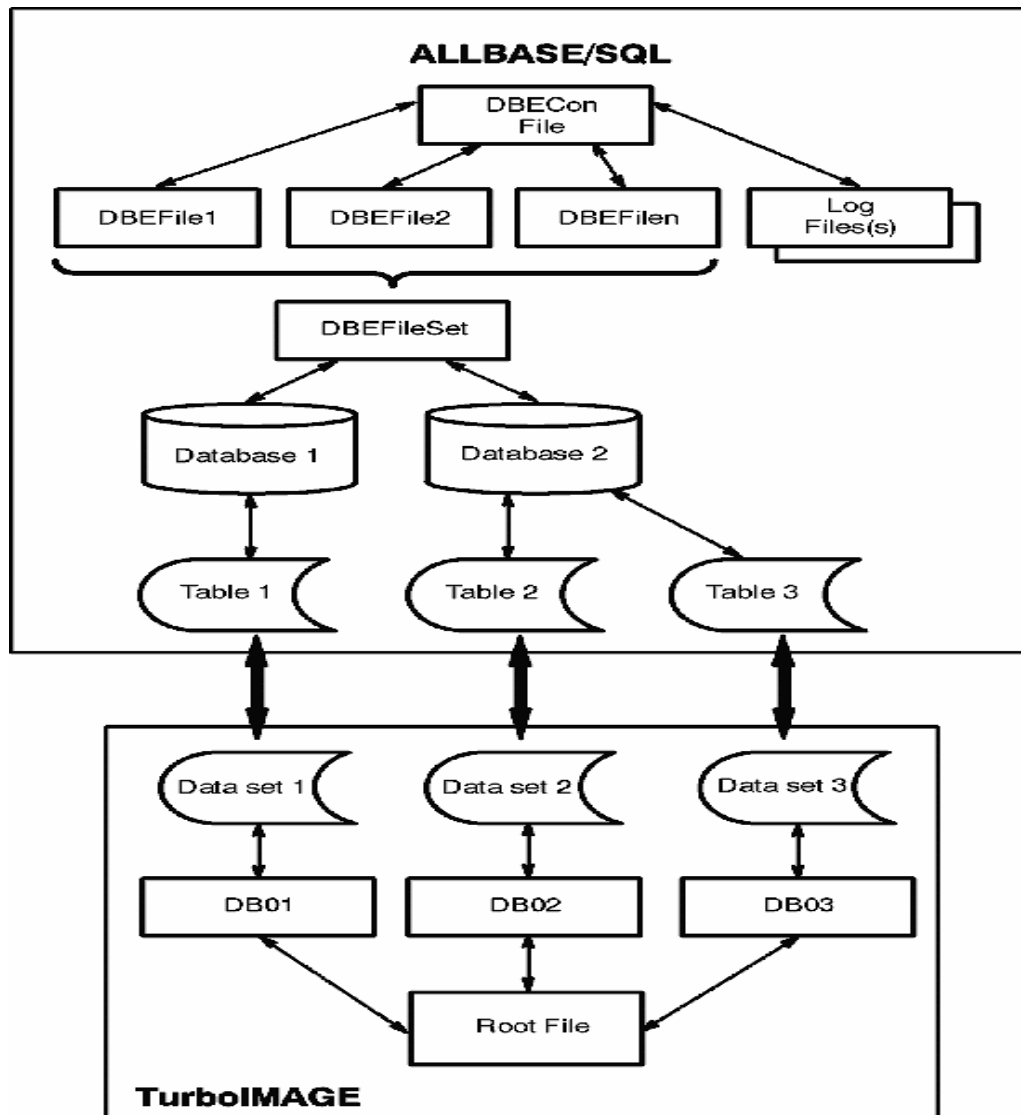# TurboImage concept

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Image/SQL concept

RDBMS selection

- What DB can support my existing db access needs
- Factors to consider
  - Price
  - Market share and popularity
  - Manufacturer credibility
  - Support track record
  - User license cost
  - Support and upgrade cost

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Choices

- Oracle (Unix/PC)
- SQL Server (PC)
- Sybase (Unix)
- Informix (Unix/PC)
- DB2 (Unix/PC)
- HP Eloquence (Unix/PC)
- PostgreSQL/MySQL (Unix/PC)
- C-ISAM/D-ISAM (Unix/PC)
- Access and others (PC)
- Flat (Unix/PC)

POP QUIZ

- What database system most appeals to you?
  - Oracle
  - DB2
  - SQL Server
  - Sybase/Informix
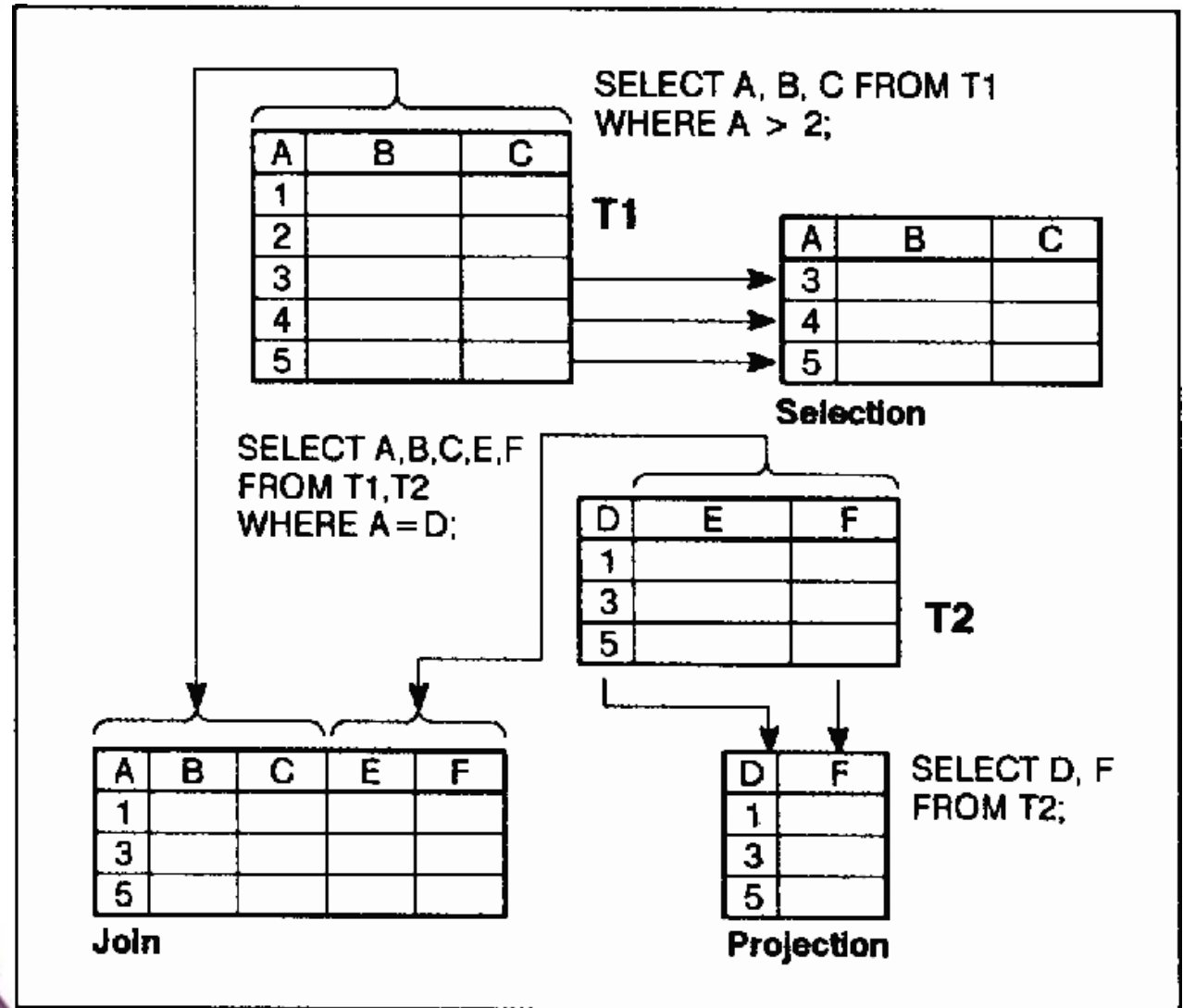 - HP Eloquence
  - PostgreSQL/MySQL

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Technical aspect

- Efficiency/Performance
- Maintenance ability
- Supporting tools
- Flexibility
- Stability
- Scalability
- Administration
- Stored procedures
- Triggers
- Locking

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SQL concept

SELECT A, B, C FROM T1
WHERE A > 2;

T1

A	B	C
1		
2		
3		
4		
5		

A	B	C
3		
4		
5		

Selection

SELECT A,B,C,E,F
FROM T1,T2
WHERE A = D;

T2

D	E	F
1		
3		
5		

A	B	C	E	F
1				
3				
5				

Join

D	F
1	
3	
5	

SELECT D, F
FROM T2;

Projection

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RDBMS

- Particularities
  - Tables not Datasets
  - Columns not Items, Rows not records
  - Indexes
  - Views and table joins
  - Column Item types
  - No arrays
  - Nulls
  - Triggers
  - Rollbacks
  - Data page and log file caching
  - Administration tools
- Unique features, SQL extensions
- Need a DataBase Administrator

Database Migration

Planning

Migration planning

- Assess current environment
- Timeframe, effort, milestones
  - When can you start?
  - Test machine
  - Completion expectance
    - Prior end of 2006 or passed?

Analyze current system

- CPUs, users, connections, databases, disk space
- Applications (critical, non-critical, purchased)
- 3rd party vendors for all apps and tools
- Types of languages
- User interface
- Data entry screen tools
- Development tools
- Operational tools
- Critical state preservation

Analyze current DB

- Architecture of Dsets
- Security
- Types of items
- Date items
- Buffer items and redefinitions
- Dirty data
- Arrays
- Data transaction volume and performance (throughput)

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Migration planning

- New database structure
  - Identical copy (Phase 1)
    - Quicker method
    - May have performance issues
    - Not taking advantage of SQL
  - Improvements (Phase 2)
    - More effort
    - More efficient
    - SQL features, extensions, etc.

POP QUIZ

- What strategy most appeals to you?
  - Replicate DB structure first, then enhance application
  - Enhance DB structure and application

Migration planning

- Automatic masters disappear
- Manual masters become tables
- Detail dsets of Manual masters become table with a a foreign key constraint
- Image SORT items become clustered Indexes
- Indexed keys become Indexes and queried with LIKE operator, unless TPI continues to be used

Migration planning

- Nulls
  - Define columns as NOT NULL
    - Least impact on code
    - Cannot take advantage of NULLs
  - Define some columns as NULL
    - May impact the code
    - Can take advantage of NULLs

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Migration planning

- Arrays
  - Method 1: One big column
    - Some code changes may be required
  - Method 2: 1 column per occurrence
    - Some code changes required
  - Method 3: New table, one row per occurrence
    - Significant code changes required
    - More flexible

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Migration planning

- Dates
  - CHAR 8
    - Keep as is
      - Does not impact code
    - Change to Datetime/Timestamp
      - Consider if time logging is needed
      - Consider to take advantage of Datetime features
      - Some code changes may be required
  - Julian
    - Keep or Change concept

Migration planning

- Integers
  - RISC: Keep same format
  - CISC: Little/Big endien issue

DB access application code

- Can you keep the code as is?
- Define access method
  - Native
  - API mappers
  - ODBC/ADO/JDBC/etc.

POP QUIZ

- What method of database access most appeals to you?
  - Image Intrinsics through mapper
  - Native SQL
  - ODBC/ADO/JDBC

Data replication & consolidation

- Export/Import
- DB migration tools
- Write your own transfer programs

POP QUIZ

- What database migration method most appeals to you?
  - Export/Import
  - Using a tool
  - Writing transfer programs

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Tests and refinement

- Migration tests
  - Data integrity tests
  - Application data access tests

Database migration

- One-shot approach?
- Running systems in parallel
- Database mirroring
  - Bulk
  - Live

POP QUIZ

- No updates: Only use the target database for testing,until ready for production

- Periodic updates: Keep new DB periodically up-to-date

- Live updates: Keep new DB constantly up-to-date

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Migration planning

- Features = changes
- Don't over do it
- Ensure that new db type and structure will be compatible with the existing apps

Migration planning

- Second phase improvements
  - Normalization
  - Views and table joins
  - Code optimization for direct SQL access
  - DateTime
  - Null items
  - Triggers

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Database Migration

Implementation

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Setup new RDBMS

- The DBA issue
  - Training, hiring
  - Remote access
- Install new db on new platform
- Make minimum access and configuration adjustments
- Create test database
- Link machines on network

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Migration implementation

- Make copy of source database
- Create new db structure
  - Native RDBMS tools
  - Native Schema scripts
  - Automated tools
- Consolidate and Replicate the data
- Data mirroring

Migration implementation

- Export/Import
  - Export data to flat files
    - Endian issue
  - Build import scripts
    - Column conversions
    - Nulls
    - Dates
    - Arrays
    - Security
  - Import data from flat files through scripts

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Migration implementation

- Data replication tools
  - GUI
  - Global changes
  - Column types conversions
  - Endien issue
  - Arrays
  - Nulls
  - Dates
  - Security
  - In-flight transformation
  - Mirroring features

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Migration implementation

- Indexing software
  - Omnidex -> OmniAccess
  - No Superdex supported

Application adaptation

- DB access method
  - Native
  - API mappers
  - ODBC/ADO/JDBC
- JCL/CI commands, etc.
- Test programs and refine code

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POP QUIZ

- What migration method most appeals to you for OS specific concepts?
  - Re-write into native commands
  - Use tool to convert into native commands
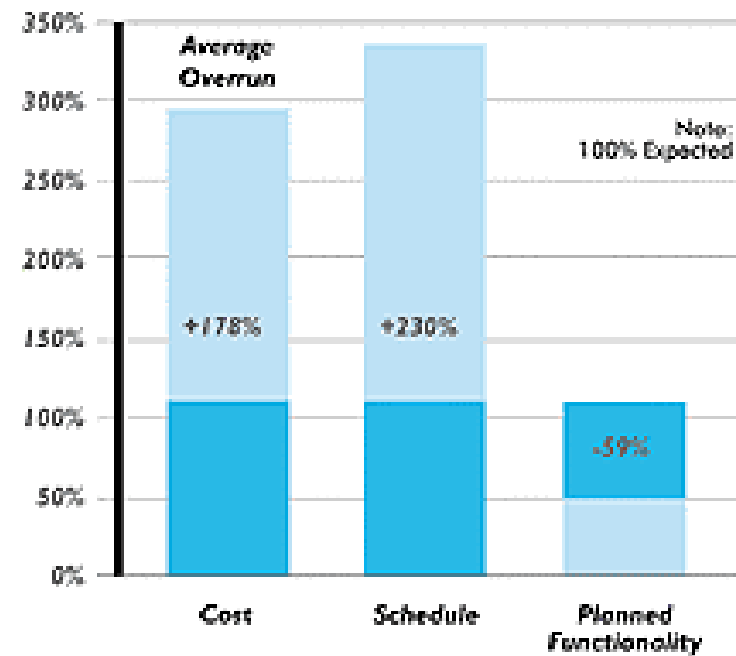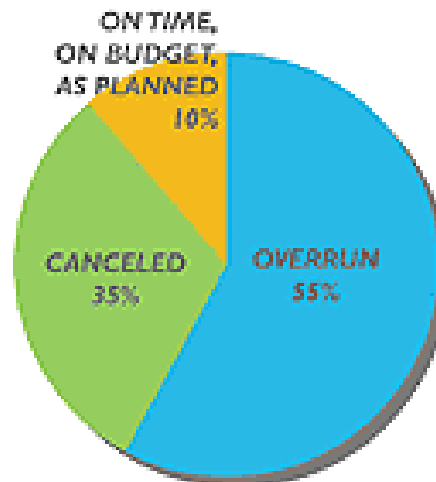 - Run your commands within an emulator

Special Topics

Best-of-breed package software

Beware of False Prophets

ERP Implementation Results

ON TIME, ON BUDGET, AS PLANNED 10%

CANCELED 35%

OVERRUN 55%

Average Overrun

Note: 100% Expected

350%

300%

250%

200%

150%

100%

50%

0%

+178%

+230%

-59%

Cost

Schedule

Planned Functionality

Source: Standish Group

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The Speedware Difference

Your trusted transition partner

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How Speedware is involved

- End-to-end migration solutions offering
  - 3GLs, 4GLs, Databases
  - Hardware procurement
  - Recommendations
- Wide range of tools
- Professional Services
- Consortiums
- Presentations/Seminars

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POP QUIZ

- What languages do you currently use?
  - Cobol
  - VPLUS
  - Fortran
  - Pascal
  - HP Transact
  - BASIC
  - RPG
  - Powerhouse