

Supply Chain Management: Enterprise CDM's Role and Relationship

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Integrated Support Systems, Incorporated

**Presented to
Washington DC Area ACDM Symposium**

31 October 2003



Introduction

- **Who's Ram?**
- **The world of CDM according to Ram.**
- **Supply Chain Management, the other SCM.**
- **Supply Chain data, old & new.**
- **Supply Chain Data Exchange.**
- **Real-time, real-world SCM examples.**
- **The CDM role, now and forever more.**

Why is CDM Important?

CDM Principles Facilitate:

- Doing the Right Thing(s)
- At the Right Time(s)
- For the Right Reason(s)
- By the Right Person(s)

... with the right Information.

CDM is the “right way”

- **The Right information**
 - to Right people,
 - at the Right time,
 - in the Right place, and
 - for the Right reasons

**Get the Right Product,
with the Right Form,
the Right Fit, and
the Right Function**

**To the Right Customer
at the Right Price
To the right Place and
at the Right Time**



CDM Short Course

- If it is not defined and identified, it can not be accounted for;
- if it can't be accounted for, it can't be traced through audit;
- if it can't be traced by audit , it can't be controlled;
- if it can't be controlled, it can't be managed, therefore;
- either define and identify it, or forget it.

What is “IT” - Product Information

(Wisdom)

(Knowledge)

(Intelligence)

Information

*Physical
Drawings
Books
Manuals
Papers
Libraries*

The old and the new:



**Documentation to Data
Paper to Digital
Manual to Automated**

1

2

3

4

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

D

D

C

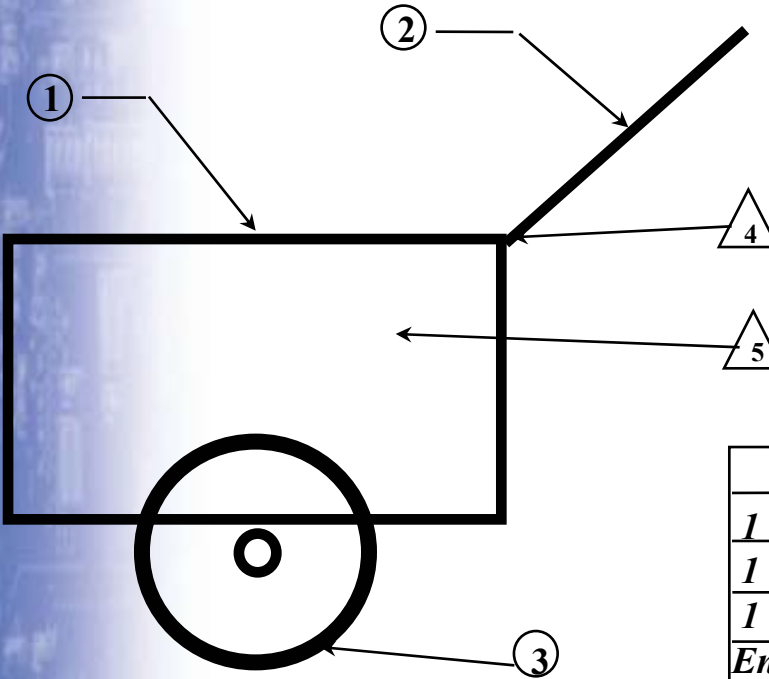
C

B

B

A

A



QTY	PART/ID NO.	DESCRIPTION/NOMEMCLATURE	MATERIAL SPEC	FN
				4
1	WA123-1	Wheel Assembly		3
1	WH123-1	Wagon Handle		2
1	WB123-1	Wagon Box		1
End	WW023-1	Wagon		
PARTS LIST				

NOTES:

1. APPLICABLE STANDARDS:
ANSI Y14.5-1982, DEM & TOLERANCES
MS-STD-12, ABBREVIATIONS

2. REMOVE ALL BURRS

3. SAND ALL EDGES

4. BOND PER MS-1234

5. LABEL PER MS-4321

CONTRACT NO.		APPROVALS		COMPANY Wonka Wagons			
		DRAWN		DWG. TITLE Wagon Assembly			
		CHECKED					
DESIGN ACTIVITY	SCALE	SIZE A	CAGE WQ123	DWG. NO. WW023		REV -	

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REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

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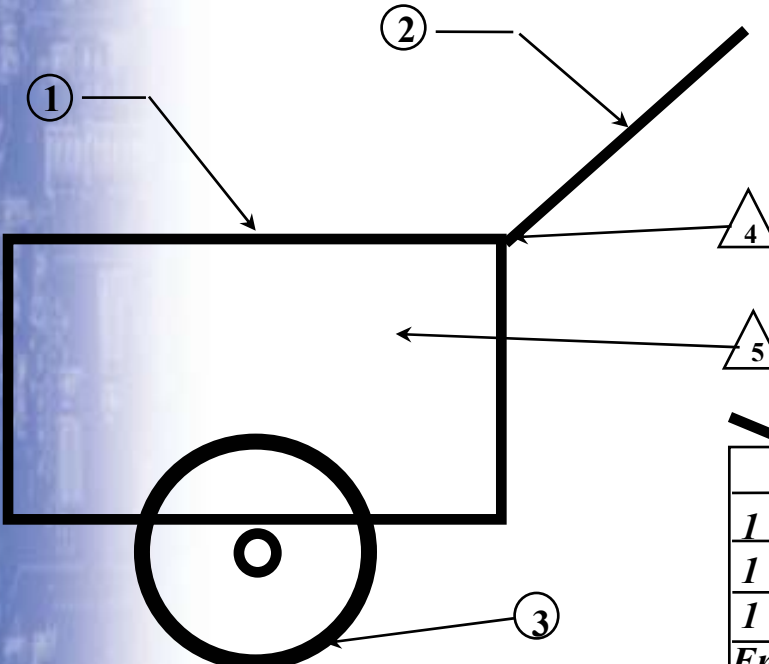
C

B

B

A

A



See Separate/Automated Parts List (S/APL)

				4
1	WA123-1	Wheel Assembly		3
1	WH123-1	Wagon Handle		2
1	WB123-1	Wagon Box		1
End	WW023-1	Wagon		
QTY	PART/ID NO.	DESCRIPTION/NOMEMCLATURE	MATERIAL SPEC	FN
PARTS LIST				

NOTES:

1. APPLICABLE STANDARDS:
ANSI Y14.5-1982, DIM & TOLERANCES
MS-STD-42, ABBREVIATIONS

2. REMOVE ALL BURRS

3. SAND ALL EDGES

4. BOND PER MS-1234

5. LABEL PER MS-4321

See Separate/Automated Parts List (S/APL)

See Application Data List

CONTRACT NO.	APPROVALS	COMPANY			
		<i>Wonka Wagons</i>			
	DRAWN	DWG. TITLE			
	CHECKED	<i>Wagon Assembly</i>			
DESIGN ACTIVITY	SCALE	SIZE	CAGE	DWG. NO.	REV
		A	WQ123	WW023	-

1

2

3

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A

1

2

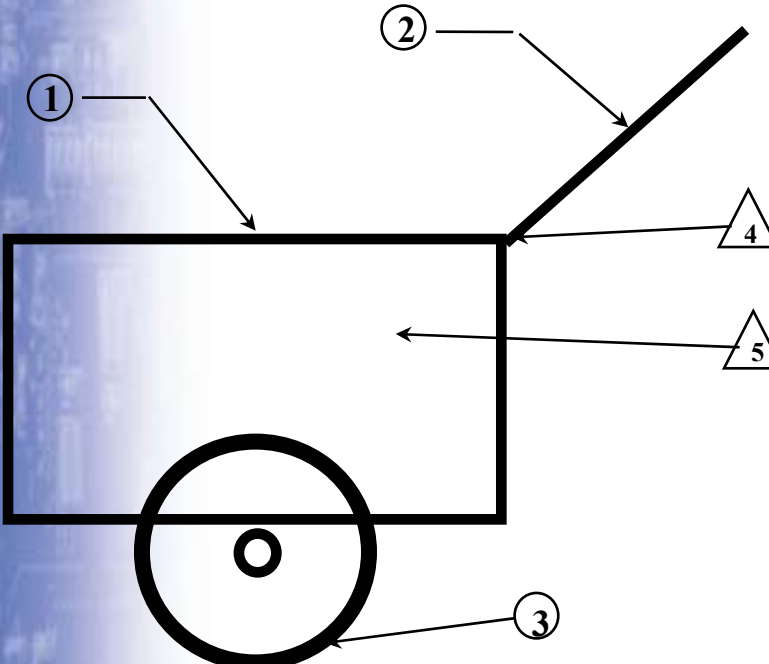
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4

ns

9

REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED



Digital Data Item #1

CONTRACT NO.	APPROVALS	COMPANY Wonka Wagons			
	DRAWN	DWG. TITLE Wagon Assembly			
	CHECKED				
DESIGN ACTIVITY	SCALE	SIZE A	CAGE WQ123	DWG. NO. WW023	REV -

PARTS LIST

DESIGN ACTIVITY

Wonka Wagon

CONTRACT NO.

WQ01

CAGE

WQ123

DATE

11/11/97

PL

WA123-1

SHEET *1*
of
SHEETS

LIST TITLE

Wagon Assembly

AUTHENTICATION

DRAWING NO.

WA123

FIND or LINE #	QTY	UNIT of MEASURE	CAGE CODE	PART or ITEM ID NUMBER	DRAWING/DOCUMENT		NOMENCLATURE or DESCRIPTION	SUPL. LISTS	NOTES
					SIZE	NUMBER			
<i>001</i>	<i>1</i>	<i>EA</i>	<i>WQ123</i>	<i>WB123-1</i>	<i>A</i>	<i>WB123</i>	<i>Wagon Box</i>		
<i>002</i>	<i>1</i>	<i>EA</i>	<i>WQ123</i>	<i>WH123-1</i>	<i>A</i>	<i>WH123</i>	<i>Wagon Handle</i>		
<i>003</i>	<i>1</i>	<i>EA</i>	<i>WQ123</i>	<i>WA123-1</i>	<i>A</i>	<i>WA123</i>	<i>Wheel Assembly</i>		

Digital Data Item #2

LTR.	DESCRIPTION/AUTH	DATE	APPD.	LTR.	DESCRIPTION/AUTH	DATE	APPD.		
								NEXT ASSEMBLY	USED ON
								APPLICATION	

NOTES LIST	DESIGN ACTIVITY <i>Wonka Wagon</i>	CONTRACT NO. <i>WQ01</i>	CAGE <i>WQ123</i>	DATE <i>11/11/97</i>	NL <i>WA123</i>	SHEET <i>1</i> of SHEETS
-------------------	---------------------------------------	-----------------------------	----------------------	-------------------------	---------------------------	--------------------------------

LIST TITLE <i>Wagon Assembly</i>	AUTHENTICATION	DRAWING NO. <i>WA123</i>
-------------------------------------	----------------	-----------------------------

NOTE #	NOTE / DESCRIPTION
704	BOND PER MS-1234
705	LABEL PER MS-4321
802	REMOVE ALL BURRS
803	SAND ALL EDGES
901	APPLICABLE STANDARDS: ANSI Y14.5-1982, DEM & TOLERANCES MS-STD-12, ABBREVIATIONS

Digital Data Item #3

LTR.	DESCRIPTION/AUTH	DATE	APPD.	LTR.	DESCRIPTION/AUTH	DATE	APPD.		
								NEXT ASSEMBLY	USED ON
								APPLICATION	

APPLICATION LIST	DESIGN ACTIVITY <i>Wonka Wagon</i>	CONTRACT NO. <i>WQ01</i>	CAGE <i>WQ123</i>	DATE <i>11/11/97</i>	AL <i>WA123</i>	SHEET 1 of SHEETS
LIST TITLE <i>Wagon Assembly</i>			AUTHENTICATION		DRAWING NO. <i>WA123</i>	

Digital Data Item #4

Application / Usage Information

LTR.	DESCRIPTION/AUTH	DATE	APPD.	LTR.	DESCRIPTION/AUTH	DATE	APPD.		
								NEXT ASSEMBLY	USED ON
								APPLICATION	

What is “IT” - Product’s Data

(Wisdom)

(Knowledge)

(Intelligence)

Information [data]

Object

File

Record

Field

Element

Character

Location / Representation
Media (format)
Storage (located)
Application (used by)
Protocols (exchanged)
Operating System
Database (related)
Meta-data (about)
Characteristics,
Attributes, & Features

What is "IT" - Product's Data

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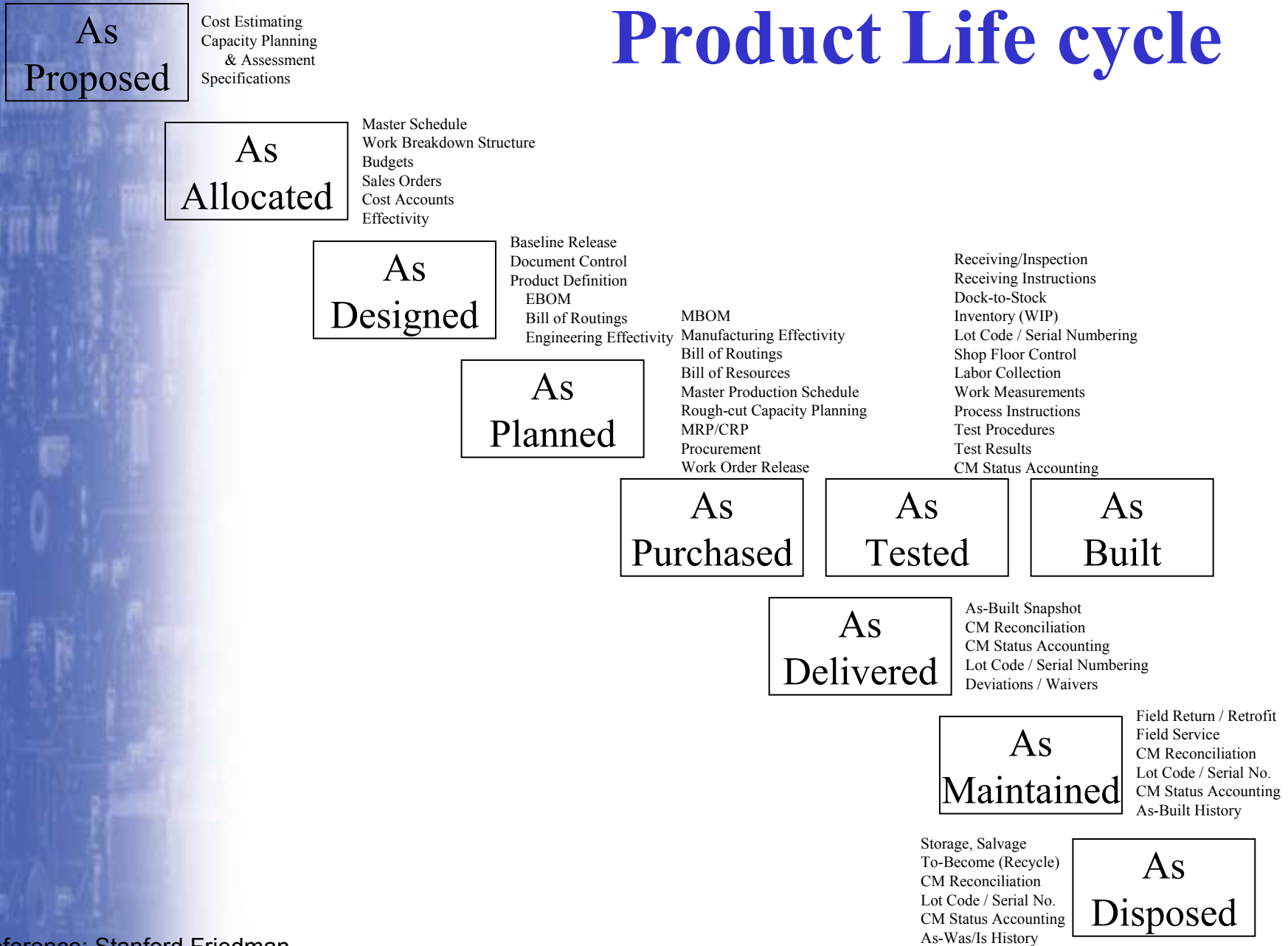
One to One
One to Many
Many to One
Many to Many

Location / Representation
Media (format)
Storage (located)
Application (used by)
Protocols (exchanged)
Operating System
Database (related)
Meta-data (about)
Characteristics,
Attributes, & Features

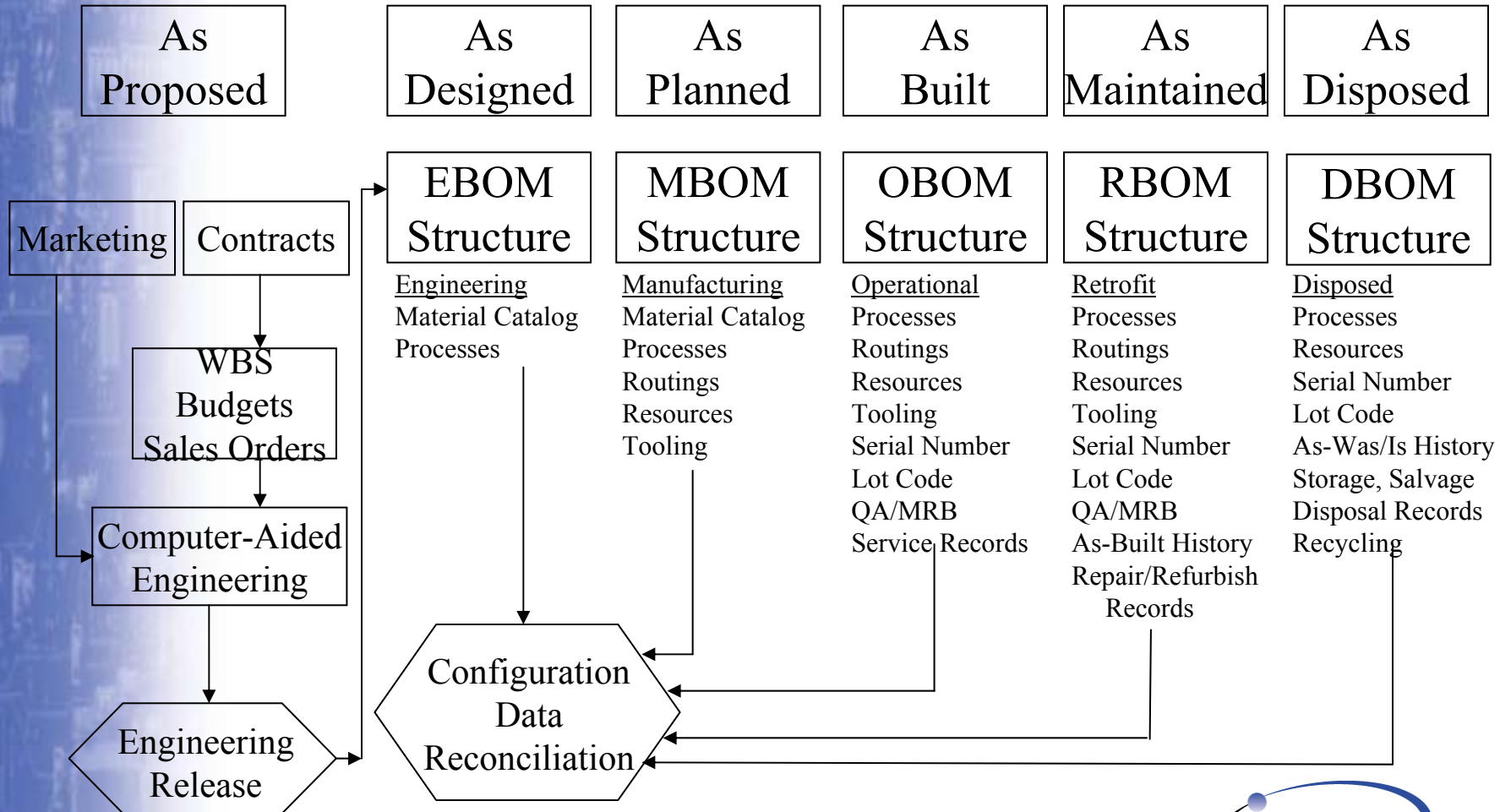
The Top Ten Reasons to Automate Configuration/Data Management

- #10 - Size & Volume**
- #9 - Time & Cycles**
- #8 - Accessibility**
- #7 - Quality Conformance**
- #6 - Changing Changes**
- #5 - Analysis Capabilities**
- #4 - Data Exchange**
- #3 - Collaboration**
- #2 - Integration**
- #1 - Complexity**

Product Life cycle



Configuration Data Management



Reference: Stanford Friedman
Midrange ERP, September 1998

Definitions (APICS Dictionary)

Supply Chain – 1) The process from the initial raw materials to the ultimate consumption of the finished product linking across supplier-user companies. 2) The functions inside and outside a company that enable the value chain to make products and provide services to the customer.

Supply Chain Management – The planning, organizing, and controlling of supply chain activities.

Definitions (APICS Dictionary)

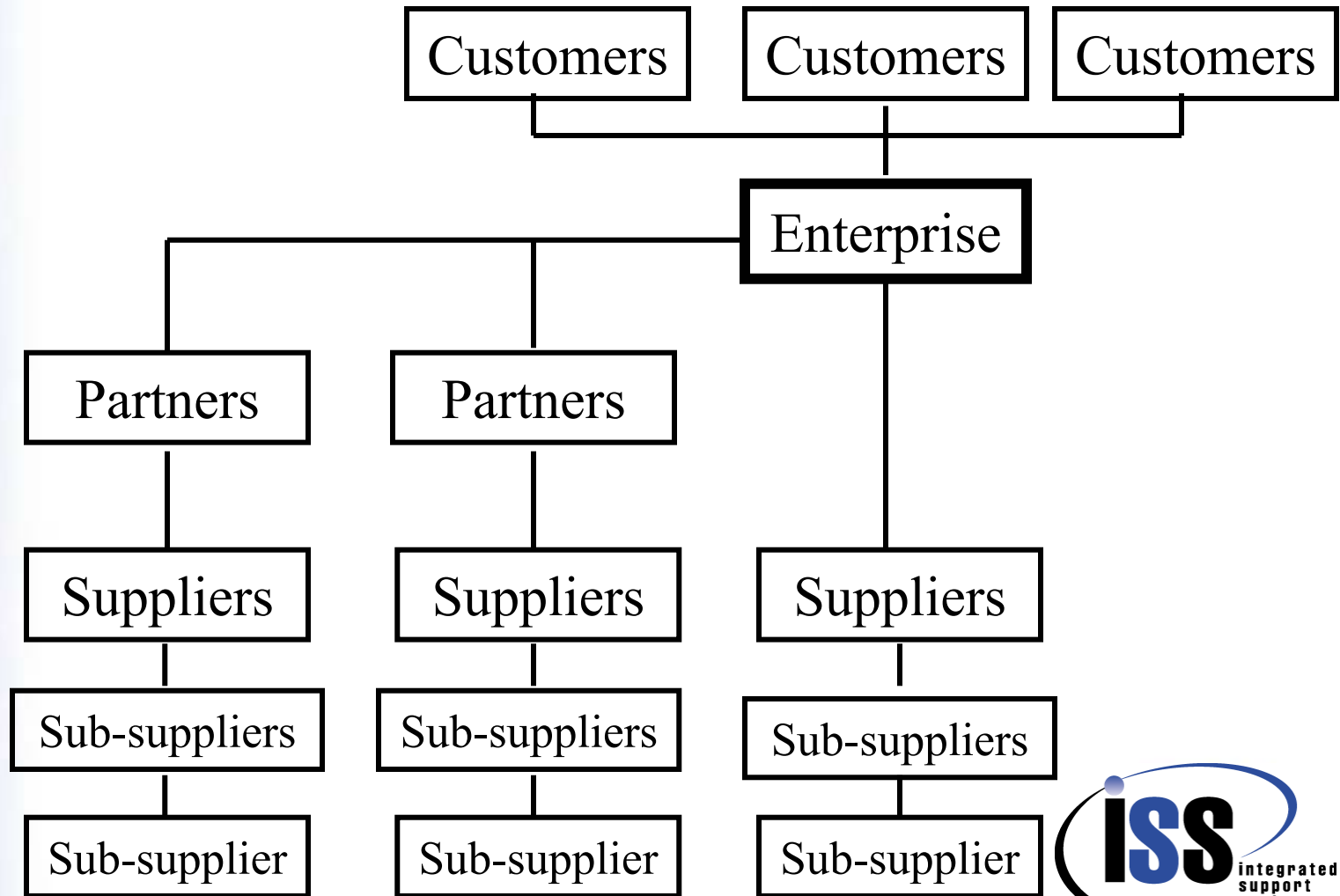
Value Chain –The functions within a company that add value to the goods or services that the organization sells to customers and for which it receives payment.

Value-driven enterprise – An organization that is designed and managed to add utility from the view point of the customer in the transformation of raw materials into a finished good or service.

CDM Role – Assuring the rights are right.

Enterprise Supply Chain Management

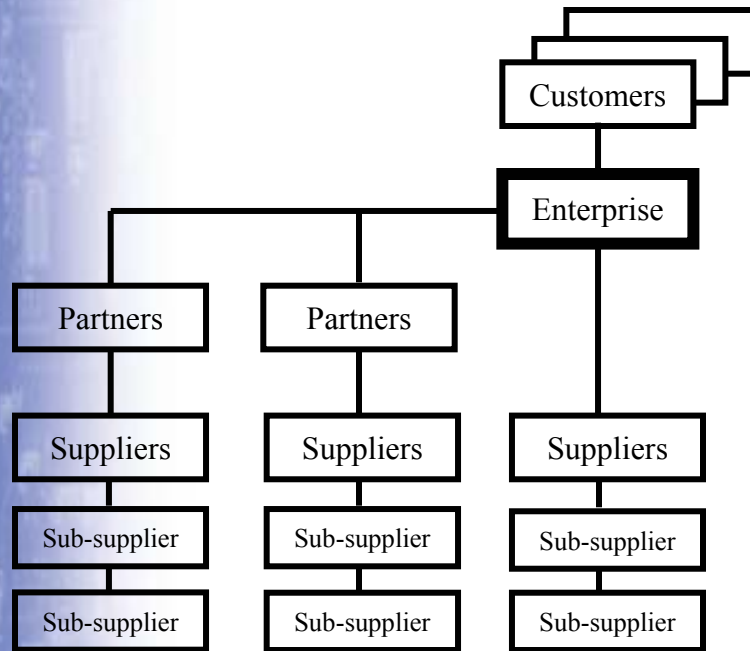
Global and Virtual Model



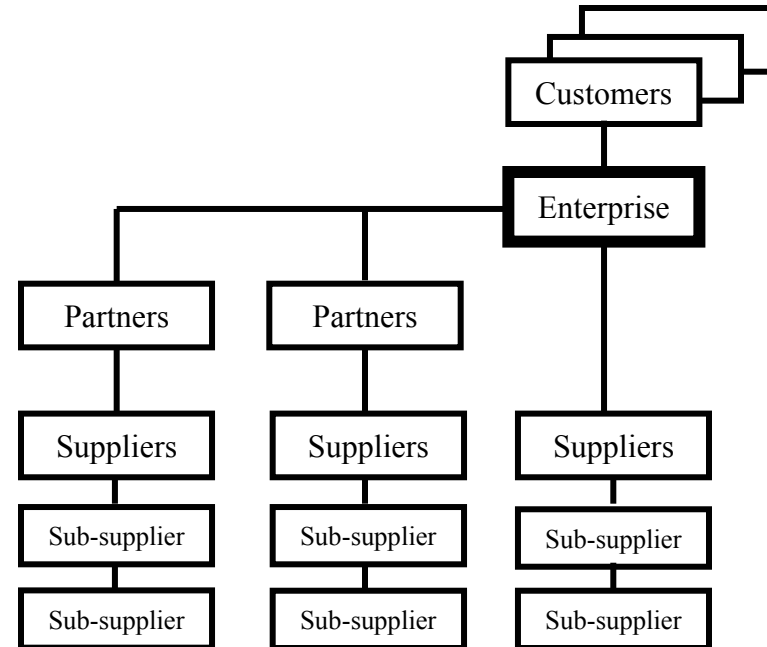
Enterprise Supply Chain Management

Global and Virtual Model

Phase “n”
Life Cycle



Phase “n+1”
Life Cycle



Time

Key Elements of Supply Chain Management

Order Entry
Configurator Functions
Planning
(Production/Manufacturing)
Scheduling
Expediting
Demands / Pulls
Capacity
Constraints
(Materials / Capacity)

Inventory
Warehousing
Picks / Issues
Staging
Work-in-Process (WIP)
Replenishment
Transportation
Stores / Yard
Loads
Routing
Duty
Freight
Rating

Customer-integration (sales order) Management and Product Configurators

Customer-integration (sales order) Management

- front-office operations - sales, service, marketing, orders
- procurement from supplier's point of view
- interactive selling
- opportunity management
- customer history, service, call management

Product Configurators

- rules based configuration
- automatic generation of bill of material
- end item definition from order entry
- configuring orders to multiple models or variations

Advanced Planning and Dynamic Scheduling

Advanced Planning

- deals with few days to few weeks
- detailed execution of the production plan
- account for current plant floor conditions
- schedules and sequences to capacity
- addresses expediting

Dynamic Scheduling

- deals with months and years
- constraint models - materials and capacity
- alternative production scenarios
- master scheduling
- material requirements planning
- capacity planning

Warehousing and Transportation Management 1 of 3

Warehousing Management (system)

- Labor planning
- Slotting
- Inventory control
- Staging
- Put-away path processing
- Picking
- Packing
- Replenishment

Warehousing and Transportation Management 2 of 3

Joint Functionality of Warehousing & Transportation

- Yard management
- Trailer management
- Load diagramming
- Vehicle/door scheduling
- ASN receiving
- Inventory visibility
- Wave planning
- Flow-through
- Cross-docking

Warehousing and Transportation Management 3 of 3

Transportation Management (system) and Logistics

- Load planning
- Routing and scheduling
- Asset management
- Load tendering
- Tracking and tracing
- Rating
- Freight payment

Demand & Distribution Planning

Demand Forecasting

- level of activity predictions (weeks)
- statistical accuracy management
- elimination of excess inventory
- ensure availability of materials

Distribution Management

- determines distribution of optimal quantities
- minimizes costs
- planning of product distribution
- distribution of vendor supplied inventory
- manages the shift from warehousing items to constant distribution

Component and Procurement Management

Component and Procurement Management

- supplier component information
- supplier's designs and processes reuse
- supply-chain information sharing
- supplier component cataloging
- ordering capabilities
- time-to-market and product costs

Production Environments

MTS - Make-to-stock (before order)

MTO - Make-to-order (after order)

MTP - Make-to-Print

ATO - Assemble-to-order

FTO - Finished-to-order

DTO - Design-to-order

ETO - Engineer-to-order

Mass Customization

Getting Sick on the Acronym Soup

DRP - Distribution Requirements Planning
MRP - Materials Requirements Planning
MRP II - Manufacturing Resource Planning II
ERP - Enterprise Resources Planning
SCM - Supply Chain Management
ISCM - Integrated Supply Chain Management

CM - Configuration Management (Context, Content)
DM - Data Management
PDM - Product Data Management
SCM - Software Configuration Management
PLCM - Product Life Cycle Management
UPLCM - Unified Product Life Cycle Management
PCDM - Product Content and Data Management

PM - Program Management (Project)
CPC - Collaborative Product Commerce
CSM - Component & Supplier Management
CAD - Computer-aided Design
CRM - Customer Relationship Management
EDI - Electronic Data Interchange

Information feeds the Supply Chain

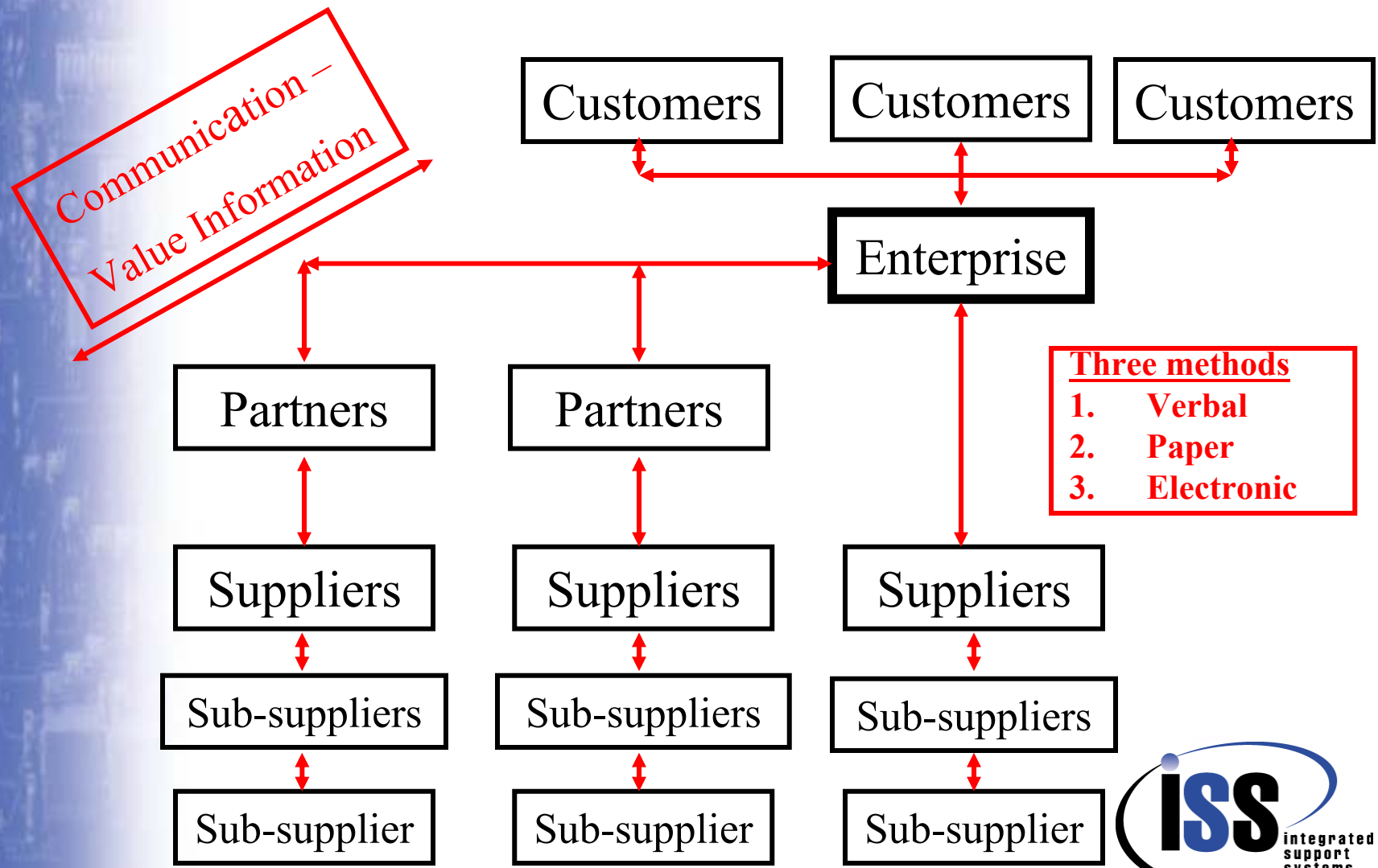
- What?
- How many?
- When?
- Where?

The supplier's
Critical four
Pieces of
Product data

**“Product data is the DNA of the value chain,
without it there is nothing.”**

Enterprise Supply Chain Management

Global and Virtual Model



Pains of Paper

Isolation/go it alone

Costs

Resources

Delays

Inaccuracies

Inaccessibility

Redundancy

Reconciliation

Validation/Verification

Key Entry Errors

Distribution

Reproduction(s)

Reporting, data collecting

Monitoring and Tracking

Physical Libraries/Cribs

Intervention Resources

Red-line Management

Physical size, oversize

Real Life Example of Manual Paper Vault



Gains of Digital

Time Savings

Accuracy

Access

Shared

Globalization

Collaboration

Commons

Standards

Teaming / Supply Chain

Shared Amortization

ISO Compliance (SPC)

Certification

ROI / Profits

Costs Avoidance

Reduced Keyed Data Entry

Re Used, Reusability

Less Training Required

Liaison activities

Reporting

Metrics

Digital Data Facilitates

Collaboration

Group Technology

Feature Based Design

**Mass Customization or Build-to-Order
(common versus unique)**

Logistics - inventory, locations, delivery

Archiving for Historical Retrieval

Data Storage

Data Conversions (Systems upgrades)

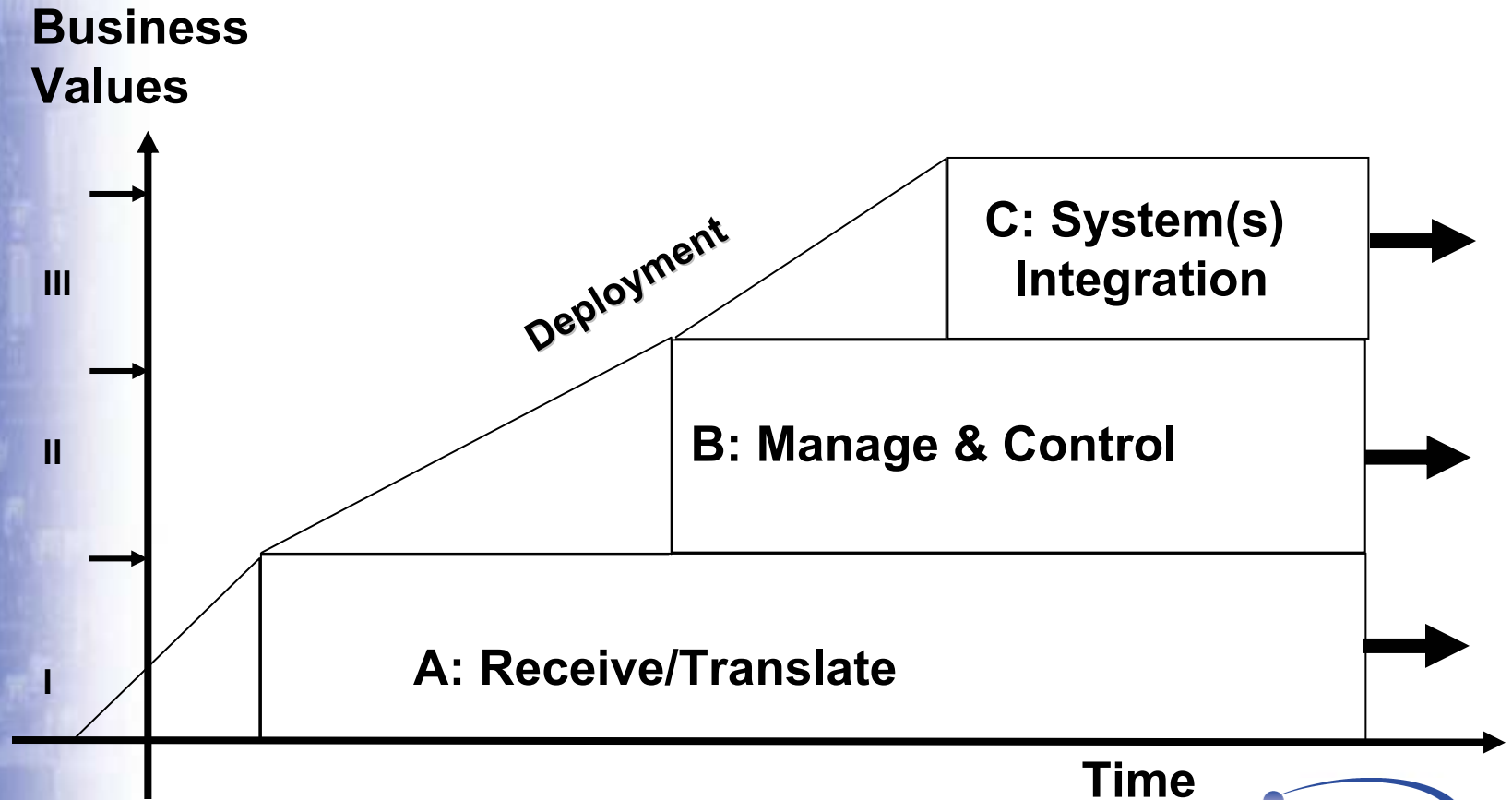
Use of Analysis Tools

Re-packaging (TDP)

Agile, Lean, and Supply Chain

Iterative Process to Making Gains

Overall Supply Chain “Capability”



Grouping the Benefits

- **Group 1 Benefits:**
 - reductions in paperwork
 - reductions in sorting/mailing time
 - reductions in input errors
 - improved cycle time
 - faster response times
 - standardized information
- **Group 2 Benefits:**
 - Reductions in inventory
 - reductions in lead times
 - improved customer relations
- **Group 3 Benefits:**
 - reductions in personnel
 - efficient business operations
 - effective use of personnel, assigned new tasks
 - time-based competition enhancements

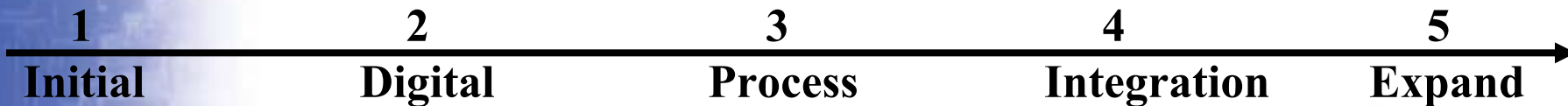
“Most benefits were due to changes in the transaction process”

APICS “Catching the 2nd Wave”

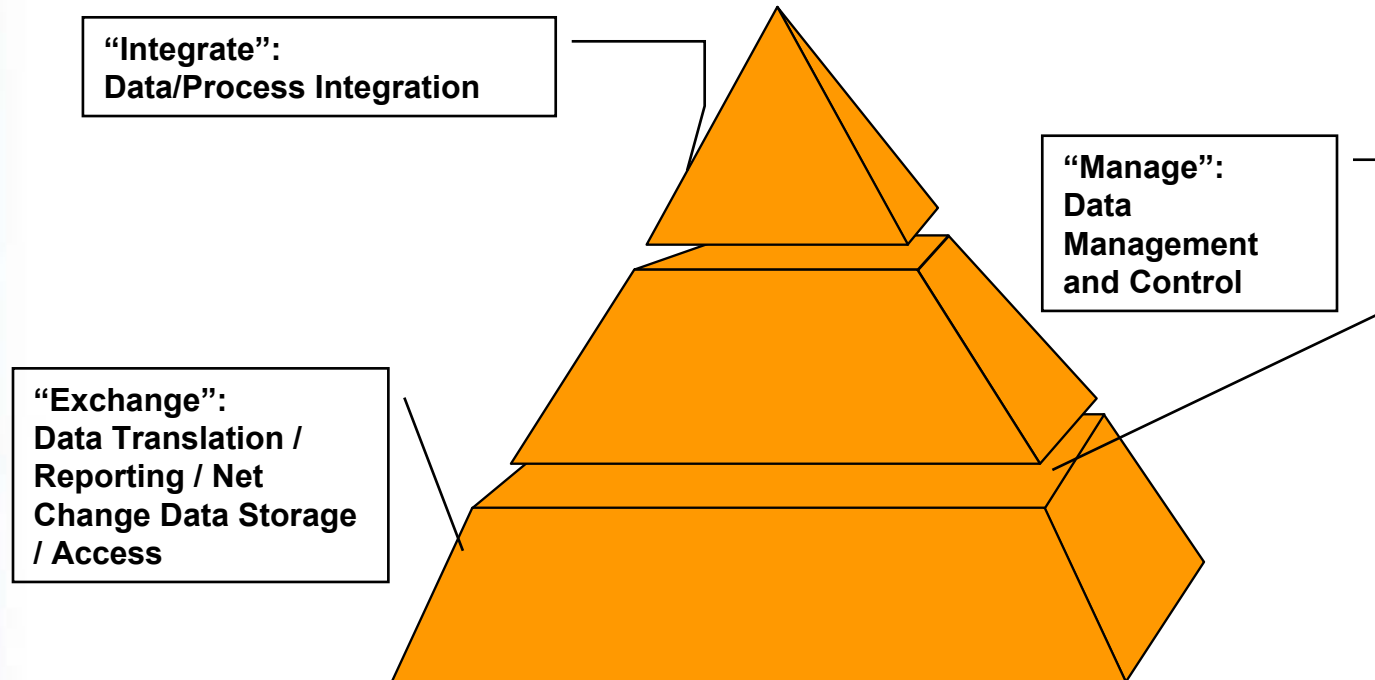
3 - Synergize
Achieve value in use. (Transform)

2 - Synthesize
Build for the future. (Effectiveness)

1 - Stabilize
Secure the base. (Efficiency)



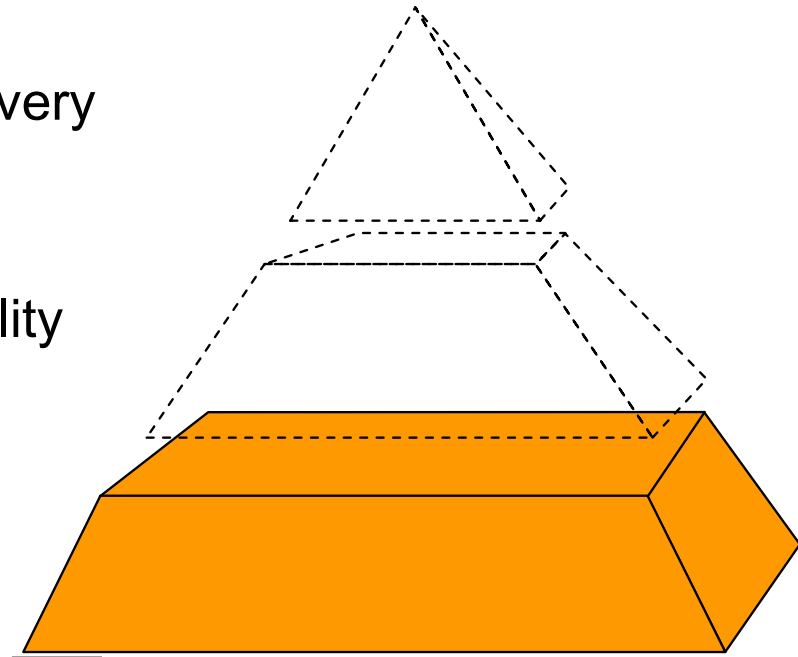
Supply Chain Digital Data Exchange Functional Requirements/ Process Improvement Opportunities



Supply Chain Needs: Exchange

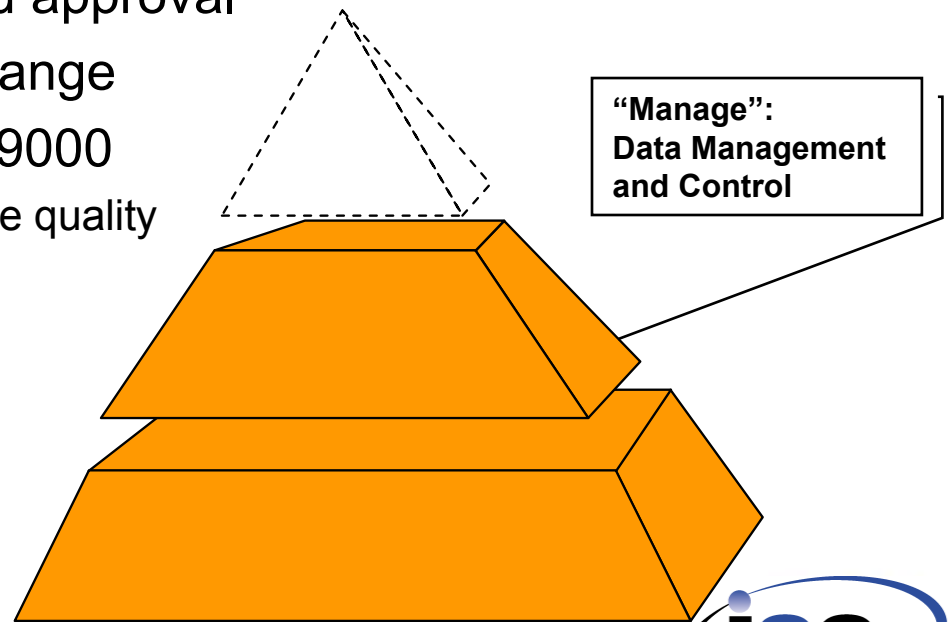
- Retrieve digital data files
- Translate to usable format
- Determine net changes in delivery
- Maintain persistent archive of enterprise design intent data
- Provide search/access capability

Data Translation / Reporting /
Net Change / Data Storage /
Access



Supply Chain Needs: Manage

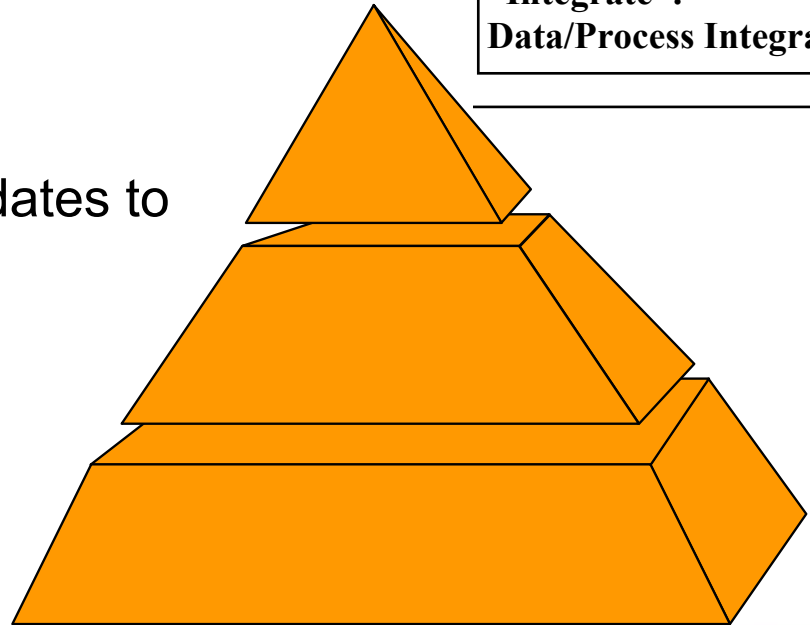
- Change disposition, status, distribution and notification
- Review, impact assessment, cost estimation and approval
- Incorporation of change
- Adherence to ISO 9000
 - Enforced /audit-able quality procedures



Supply Chain Needs: Integrate

- Product Definition and Change data must be incorporated into other systems
 - ERP
 - CAPP
 - Purchasing
- Manual or digital updates to other systems

**“Integrate”:
Data/Process Integration**



Options for Supply Chain Integration

Option 1: Mandate Suppliers Utilize Particular Software Tools (CAD, PDM/CM, ERP, etc.)

- Purchase, implementation, and training costs could be very expensive
- Limits Enterprise supplier choices
- Prevents utilization of “Best of Breed” software
- Difficult to exchange product data between disciplines (Ex. design and support)
- Suppliers must meet the requirements of all customers

Options for Supply Chain Integration

Option 2: All Product Data Resides at Enterprise; Suppliers Access Externally

- Enterprise must implement solution that meets needs for security, performance, reliability, supportability...
- Supplier needs to be trained
- Supplier may need to maintain multiple product data repositories
- Suppliers Must Meet the Requirements of all their Customers

Options for Supply Chain Integration

Option 3: Point-to-Point Integration Between Applicable Product Data Systems

- Costly to implement
- Costly to expand scope
- Costly to maintain
- PTP Integration needs to be updated when any system utilizing product data is upgraded
- Prevents utilization of “Best of Breed” software
- Deployment delayed until PTP solution available
- Suppliers Must Meet the Requirements of all their Customers

Options for Supply Chain Integration

Option 4: Use an Internationally Recognized and Commercially Accepted Neutral Data Definition

- Avoids the inflexibility and cost of a mandate
- Allows suppliers to process applicable product data using best business practices
- Enables cost-effective, COTS solutions to Product Data Exchange
- Supplier can create local “Type Design” database of the enterprise design intent.
- Supplier can support multiple enterprises
- Data may be integrated/interfaced to other supplier data systems (ERP, CAD, PDM, etc.)

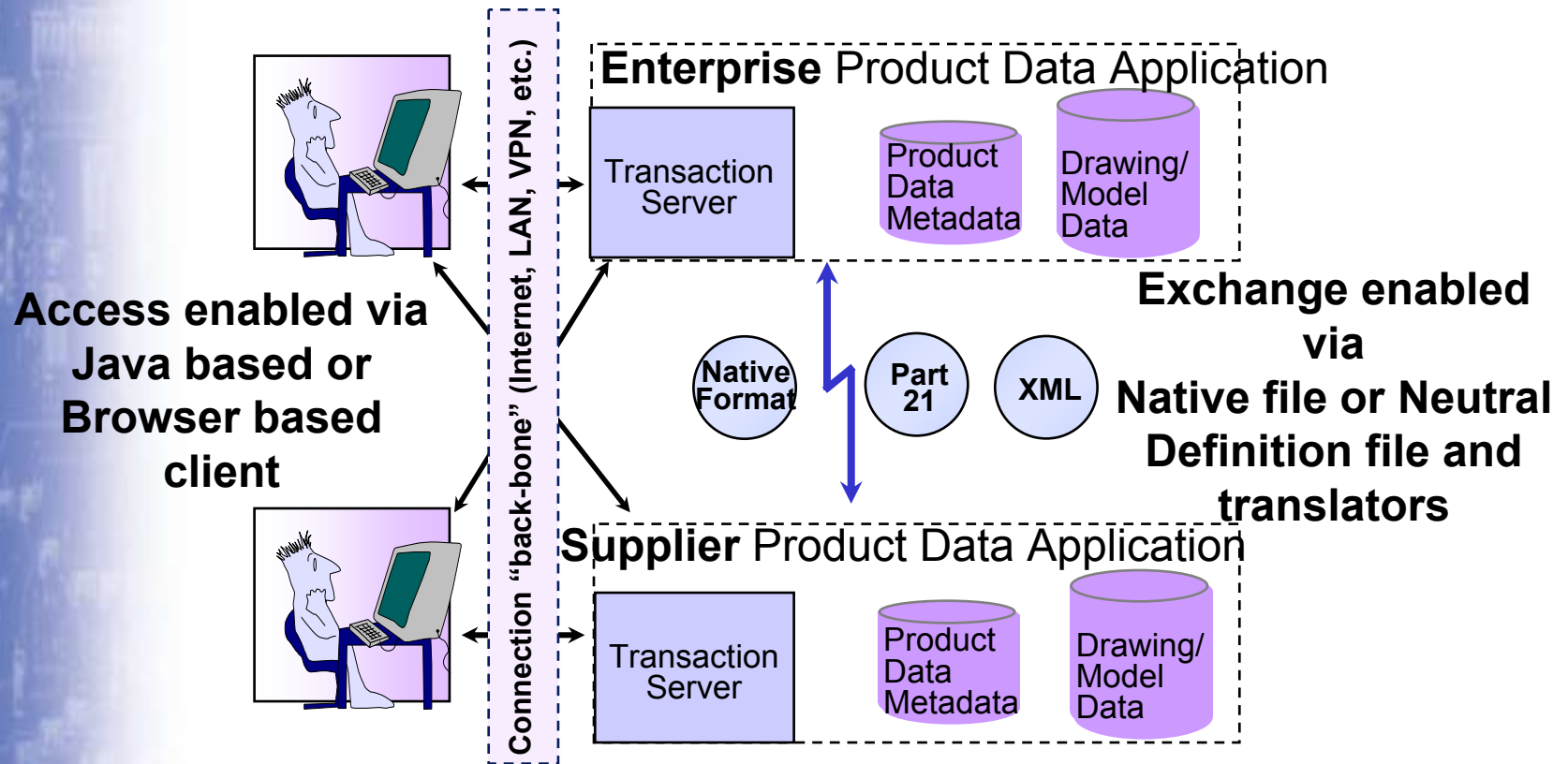
STEP, The Accepted Standard

STEP

Standard for the Exchange of Product model data

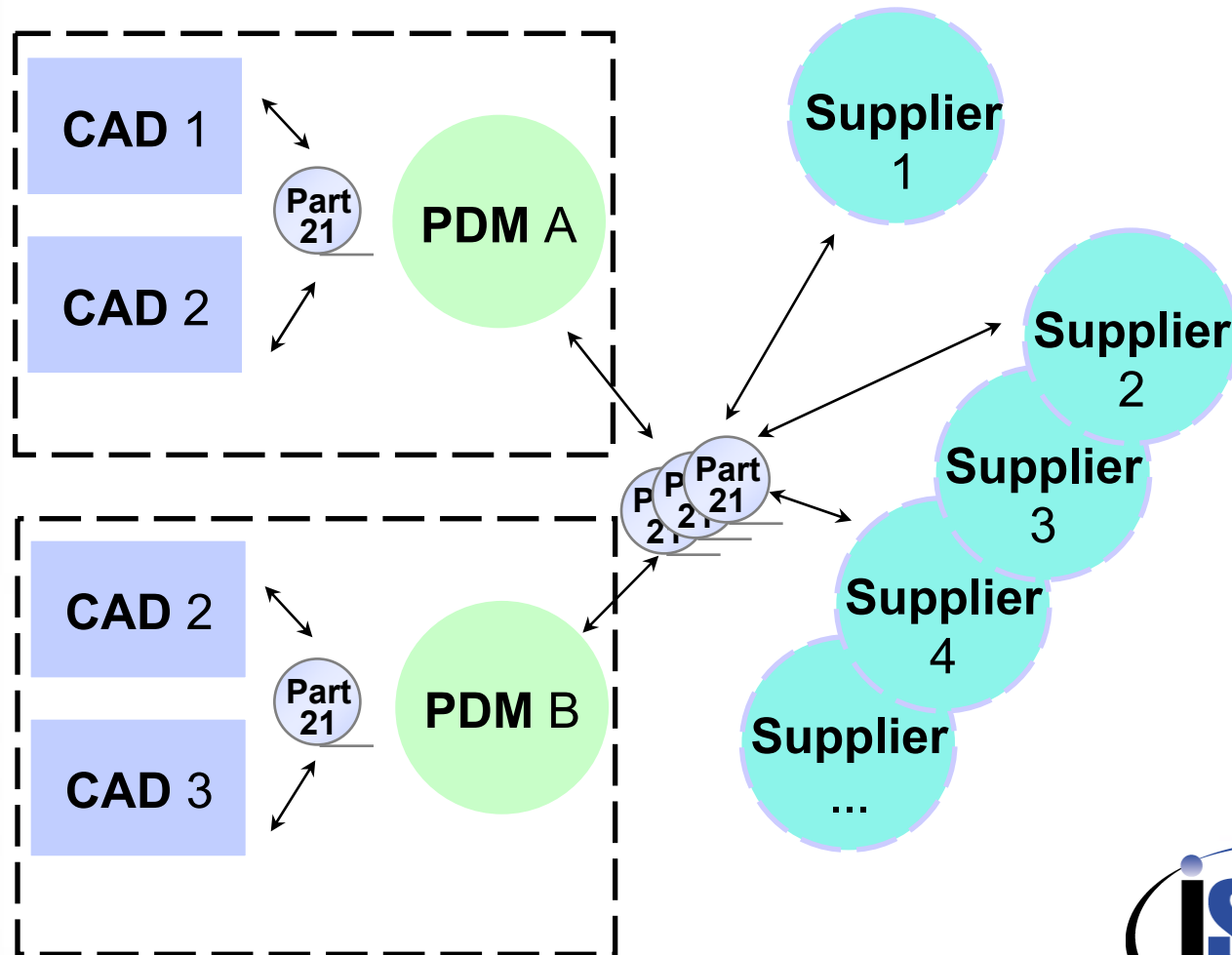
- ISO 10303 family of standards
- STEP translators available for nearly every major CAD vendor
- STEP Centers
 - U.S., Germany, France, Italy, Japan, Canada, Australia, and China

Product Data Exchange / Access In Distributed Supply Chains



CM/PDM Data Exchange

Neutral File Exchange Model



STEP Part 21 File

1-SCML_BTST5BW1.STP - Notepad

File Edit Format Help

```

ISO-10303-21;
HEADER;
/* Generated by software containing S
 * from STEP Tools, Inc. (www.steptoo
 */

FILE_DESCRIPTION(
/* description */ (Supplier Custom Mo
/* implementation_level */ '2;1');

FILE_NAME(
/* name */ 'SNETDDAT0926200318414
/* time_stamp */ '2003-09-26T18:41:54(
/* author */ (NULL),
/* organization */ ('The Boeing Compa
Seattle, WA 98124'),
/* preprocessor_version */ 'ST-DEVEL
/* originating_system */
'PDM.c Version action - A2.4P4 (A2.4F
/* authorisation */ 'PDM');

FILE_SCHEMA ((TECHNICAL_DATA
ENDSEC;

DATA;
#10=APCLAS(#12,#11,(#23));
#11=CLSSL('type of notation',$);
#12=CLSL('STANDARD NOTES',$);
#13=DESCRIPTION_ATTRIBUTE('apf
#14=(
CNFEFF(#32)
EFFCTV(')
PRDFEF(#15)
SRNMEF('930','930)
);
#15=PRDFUS(",",#,100,#101);
#16=PDCA(#101,#105,#17);
#17=PDCR(",");
#18=APDCRF(#95,"(#15));

```

1-SCML_BTST5BW1.STP - Notepad

File Edit Format Help

```

#24=PRDFRP(#39,#27);
#25=PRDFRP(#40,#28);
#26=PRDFRP(#41,#29);
#27=RPRSNT('notation',(#20),#30);
#28=RPRSNT('notation',(#21,#23),#31);
#29=RPRSNT('indentured level tag',(#22),#32);
#30=RPRCNT(",");
#31=RPRCNT(", document parameters");
#32=CNFDSG(#33,#107);
#33=CNFITM('VV302',"#,34,");
#34=PRDCNC('767',"#,35);
#35=PRCNCN('BCA',#131,'airplane');
#36=PRDFRL(",fulfills",#99,#100);
#37=ASCA(#42,(#38));
#38=PRPDFN(",indentured data list header
#39=PRPDFN('descriptive properties',$,#100);
#40=PRPDFN(",indentured data list body p
#41=PRPDFN(",indentured data list entry p
#42=SCRCLS(",item security classification",
#43=SCCLLV('BOEING PROPRIETARY');
#44=APDTTM(#45,#52);
#45=DTANTM(#48,#46);
#46=LCLTM(18,41,49,#47);
#47=CUTO(8,0, BEHIND);
#48=CLNDT(2003,26,9);
#49=APPROR(#91,#52,#50);
#50=APPRL('release authentication');
#51=APAPAS(#52,(#38,#14));
#52=APRVL('#53,'release authentication');
#53=APPSTT('PDM');
#54=RLASS(#61,#65);
#55=RLASS(#62,#44);
#56=RLASS(#62,#51);
#57=RLASS(#63,#18);
#58=RLASS(#61,#66);
#59=RLASS(#64,#19);
#60=RLASS(#61,#67);
#61=OBJRL('change identification',$);
#62=OBJRL('release authentication',$);

```

1-SCML_BTST5BW1.STP - Notepad

File Edit Format Help

```

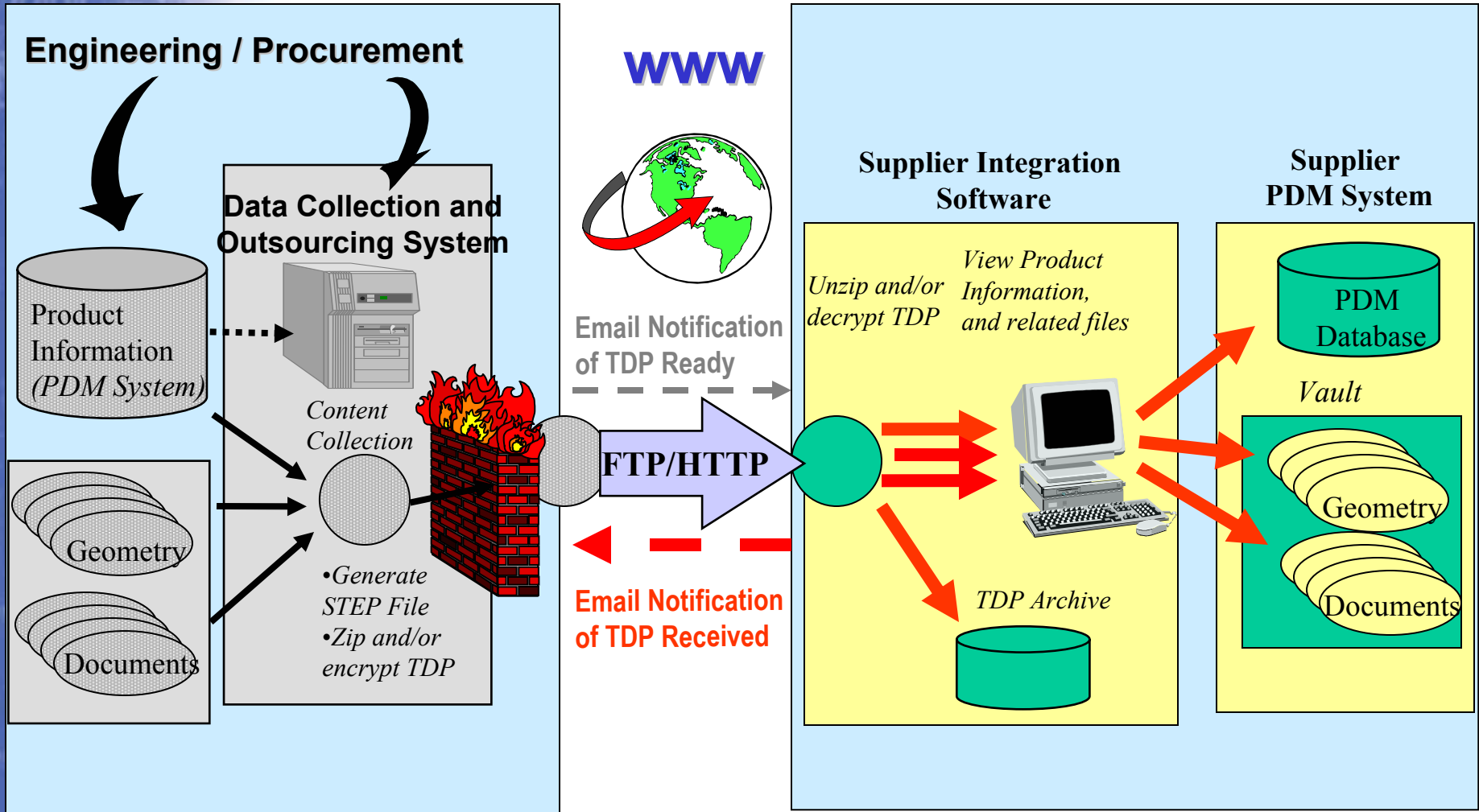
#96=DCMNT(",",#98);
#97=DCMTYP('configuration controlled document definition');
#98=DCMTYP('configuration controlled document version');
#99=PRDDFN('M', 'indentured data list content',#107,#102);
#100=PRDDFN('M', 'item',#109,#103);
#101=PRDDFN('M', 'item',#110,#104);
#102=PRDFCN('document version',#131,"");
#103=PRDFCN('supplier custom part definition',#131,'manufacturing');
#104=PRDFCN('module definition',#131,'manufacturing');
#105=PRDFCN('indentured data list entry',#131,"");
#106=PDFR(", alternate element identification",#107,#108);
#107=PRDFFR('K',#123);
#108=PRDFFR('/NULL',#124);
#109=PRDFFR(",#125);
#110=PRDFFR('A',#126);
#111=PRDFFR('B',#127);
#112=PRCTRL(",#116,#117);
#113=PRCTRL(",#117,#118);
#114=PRCTRL(",#116,#119);
#115=PRCTRL(",#120,#121);
#116=PRPC('document',#123,#124,#127);
#117=PRPC('indentured data list',#123);
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END-ISO-10303-21;

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Enterprise Supply Chain Data Exchange Implementation

Enterprise

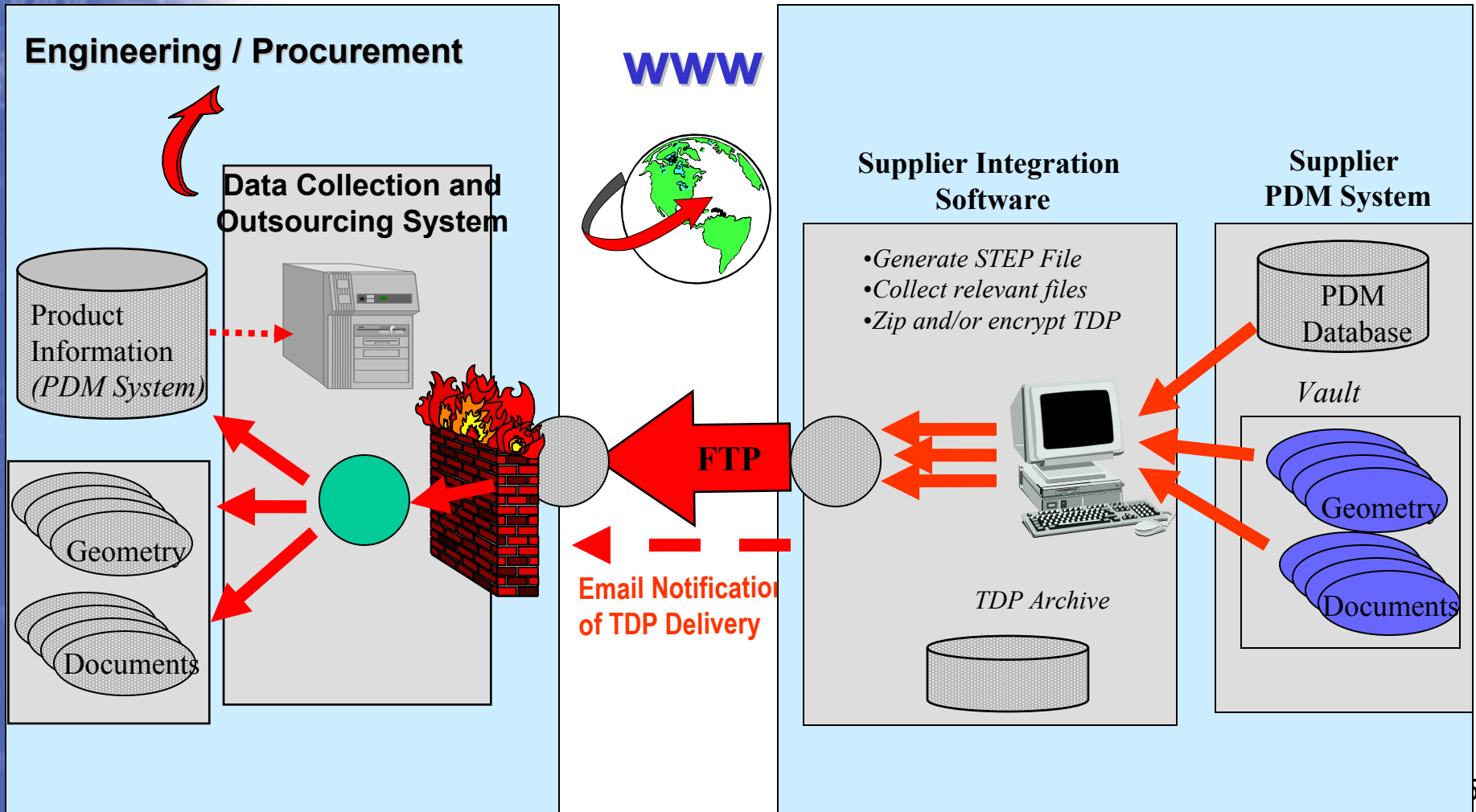
Supplier



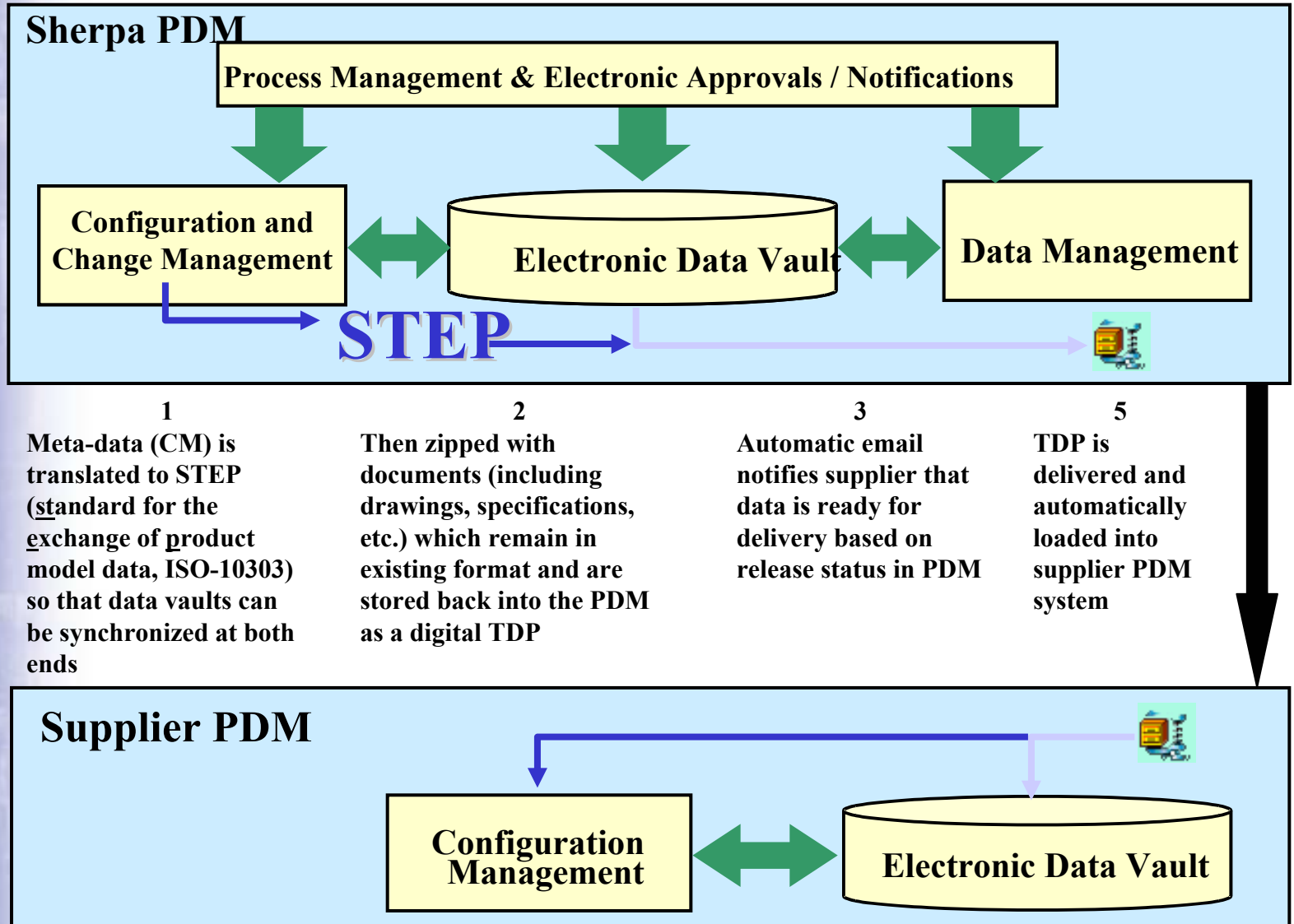
Enterprise Supply Chain Data Exchange Implementation

Enterprise

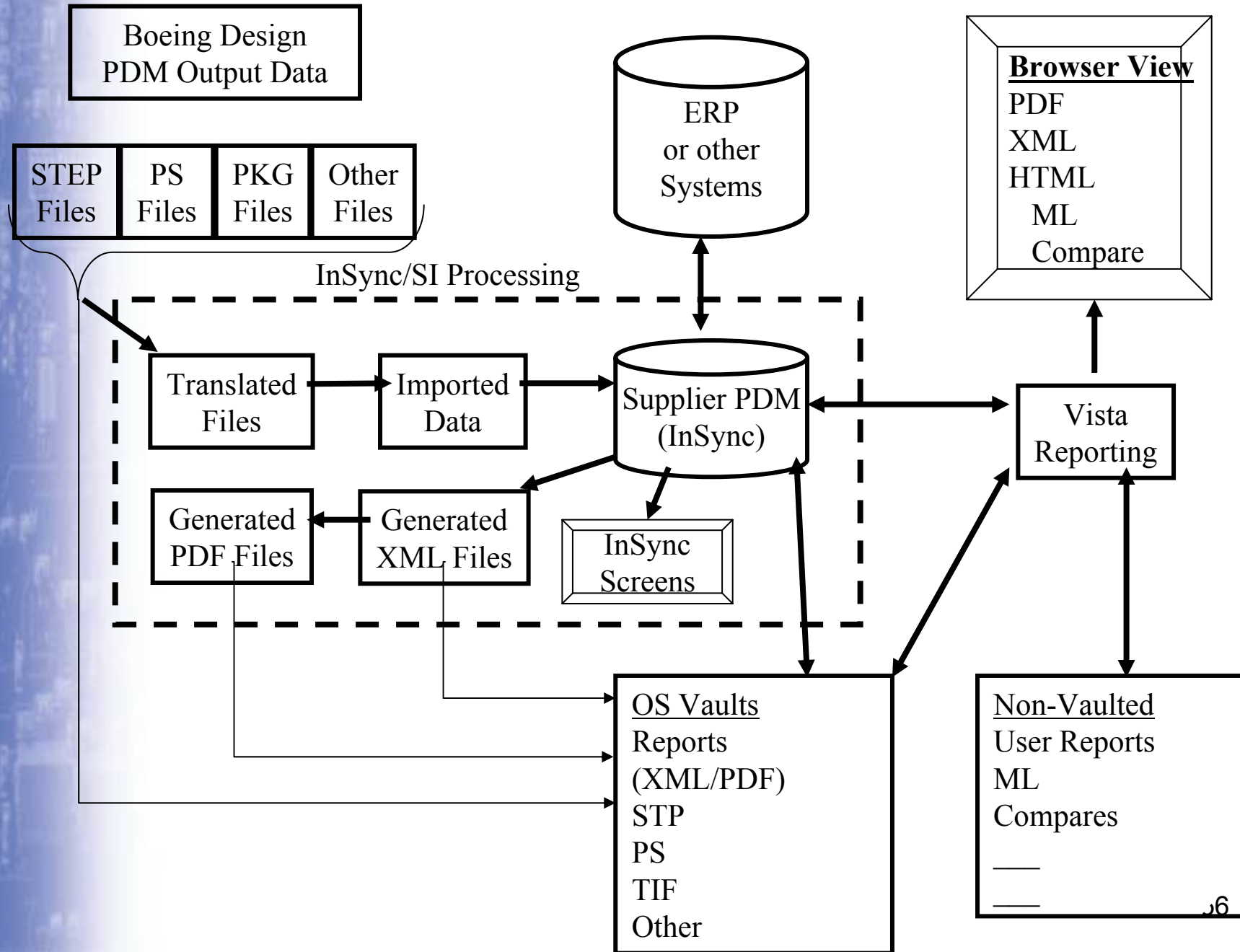
Supplier



Raytheon Supply Chain Data Exchange



Boeing (BCA) Supply Chain Data Exchange

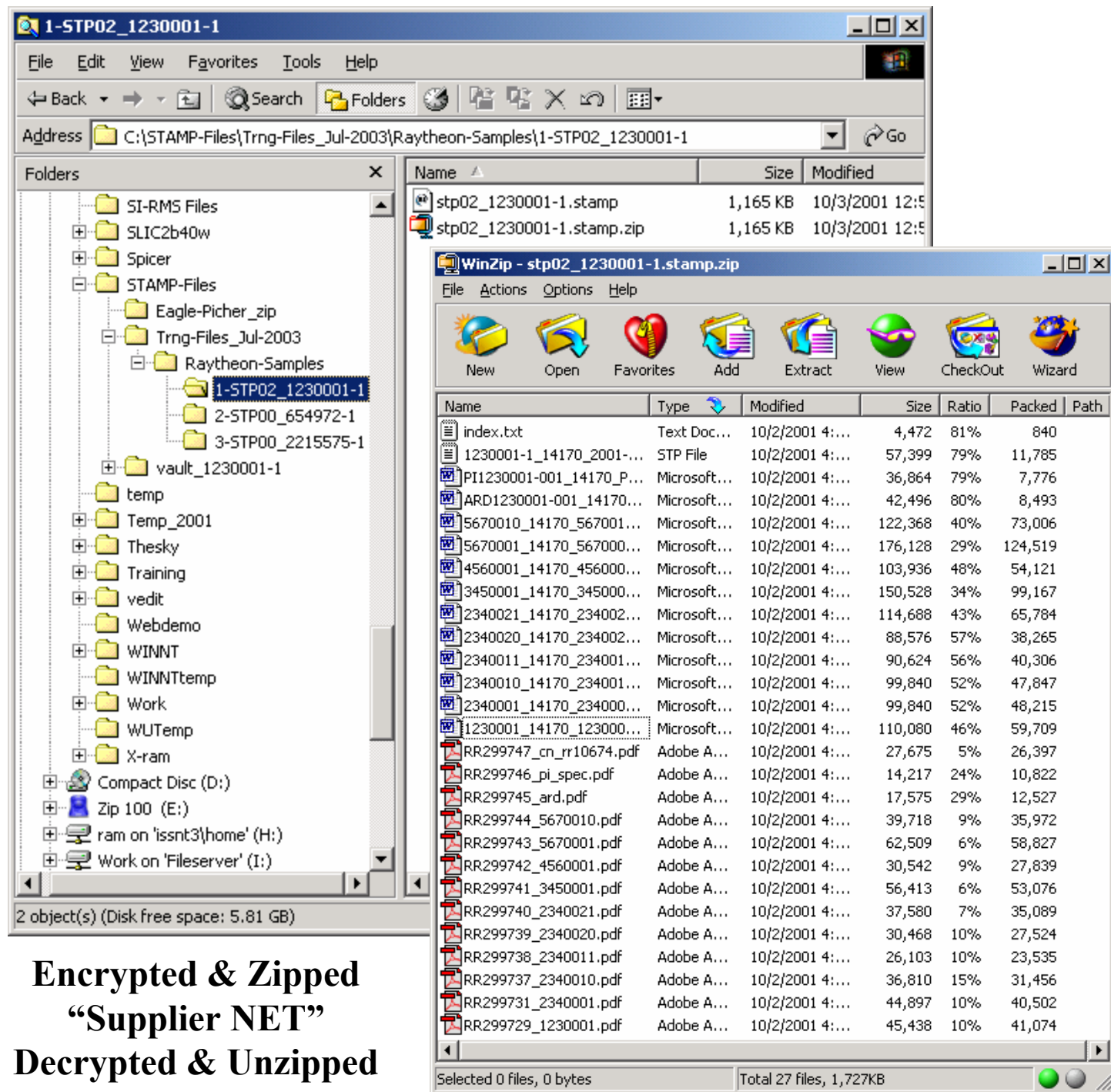


Technical Data Package

Documentation Requirements

(Supported by the STEP AP 232 & PDM Schema)

- Conceptual design drawings
- Developmental drawings and associated lists
- Product drawings and associated lists
- Commercial drawings and associated lists
- Special inspection equipment (SIE) drawings and associated lists
- Special tooling drawings and associated lists
- Specifications
- Packaging/Handling documents and data
- Software documentation
- Quality Inspection Criteria
- Critical Manufacturing Processes



Encrypted & Zipped
“Supplier NET”
Decrypted & Unzipped

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index_030701095526.txt - Notepad
File Edit Format Help
I230001-1_14170_2001-10-02T16-26-05.idx

STAMP Product Data Index
Data Exchange Manager (DEM)
Raytheon west

Product Structure

-----
File_Indicator Object_Type\Object_Id_with_Cage\Rev (Relation)
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Y DOCUMENT\1230001&14170\ - (desc_by)
N MODEL\1230001&14170\0001 (derived_from)
Y DOCUMENT\ARD1230001-001&14170\ - (desc_by)
Y DOCUMENT\PI1230001-001&14170\ - (desc_by)
N DOCUMENT\MIL-STD-882&96906\C (calls_out)
N DOCUMENT\MIL-STD-1686&96906\C (calls_out)
N DOCUMENT\MIL-STD-130&96906\J (calls_out)
N DOCUMENT\MIL-M-8856&81349\ - (calls_out)
N DOCUMENT\MIL-HDBK-263&81349\B (calls_out)
N DOCUMENT\MIL-E-6051&81349\D (calls_out)
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N PART\MIL-G-174&81349\0001 (uses)
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TDP Index File

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Y WORKAUTH\CN_RR10674\0001
Y DOCUMENT\5670010&14170\ -

Supplier Instruction
-----
(Special instructions go here if required)
```

1230001_14170_1230001.doc - Microsoft Word

File Edit View Insert Format Tools Table Window Help WordSmith

Type a question for help

Normal + Arial, Arial 10 B I U Final Showing Markup Show

1 2 3 4 5 6 7

10 9 8 7 6 5 4 3 2 1

Page 1 Sec 1 1/4 At 0.8" Ln 1 Col 1 REC TRK EXT OVR English

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Bookmarks

Signatures

Thumbnails

- The ATF Models shall meet the performance requirements as specified in P1230001-001.
- The ATF Models shall be tested in accordance with the requirements as specified in AR2320001-001.
- Mark CAGE Code, Part Number, and Serial Number using MIL-STD-130 on gathering. Serial Number to be assigned non sequentially.
- Electrostatic Discharge Control program for production of electrical and electronic parts, assemblies, and equipment shall be in accordance with MIL-STD-1686, Rev. C, Class I, and MIL-HDBK-303, Class I.
- Mark with the MIL-STD-1900 ESD symbol. 33 high minimum. Use 44 AWG MIL-STD-130.

-1

REV	DATE	BY	APP
A	14170	1230001	
REV	DATE	BY	APP
		2	

2 of 3 8.5 x 11 in

Files packaged within the TDP

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Bookmarks
Thumbnails
Signatures

Revision History

REV	DATE	DESCRIPTION	APPROVED
1	10/12/01	EM STAMP REVISION	

NO WORDS IN ITALICS. CHANGES SHALL BE INCORPORATED DWT THE DESIGN ACTIVITY

Copyright © 2001 XYZ Widget Corp. All Rights Reserved

REV	DATE	DESCRIPTION	APPROVED		
4	1	14170	3410001-1	Proportional Steering Assy	
3	1	14170	450001-1	Wing Assy	
2	1	14170	340001-1	Wing Assy	
1	1	14170	320001-1	Sub-assy Assy	

REV	QTY	CAGE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SPECIFICATION
-			PART DASH NO.	PARTS LIST	

REVISION STATUS OF ALL SHEETS IS: -

UNLESS OTHERWISE SPECIFIED

- DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN INCHES
- DIMENSIONS ARE TO BE HUNDRETHS UNLESS OTHERWISE SPECIFIED
- DIMENSIONS ARE TO BE DECIMALS UNLESS OTHERWISE SPECIFIED

XYZ Widget Corp
Tomball, AZ 80000

TITLE
AM³ Missile Assembly

Part No: **14170** Project No: **1230001**

Sheet No: **1**

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Signatures

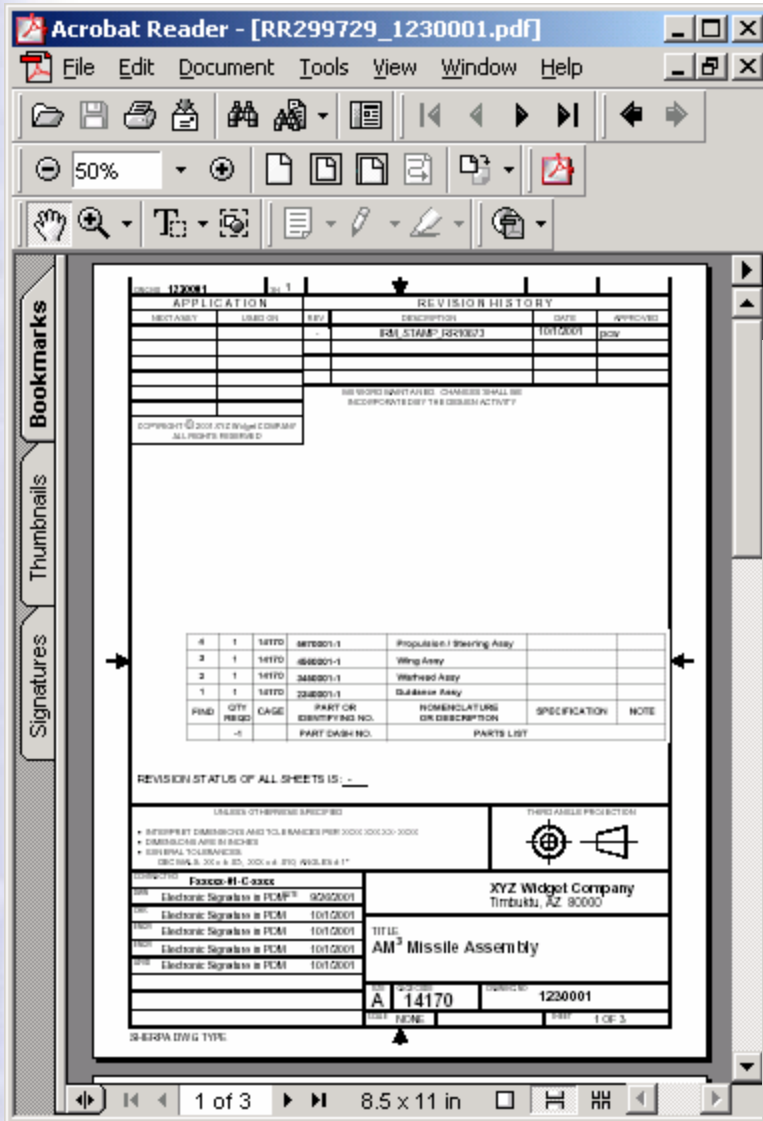
Interface Diagram

Labels in diagram: NOSE CONE, WING, ELECTRONICS, BATTERY, LAUNCH MOTOR, MISSILE HOUSING, UNIBLOCK, ACTUATORS, GAS BOTTLE, WING SPOILER, CONTACT PLATE, WIRE HARNESS, FLIGHT MOTOR, BEACON, WIRE SPOILER

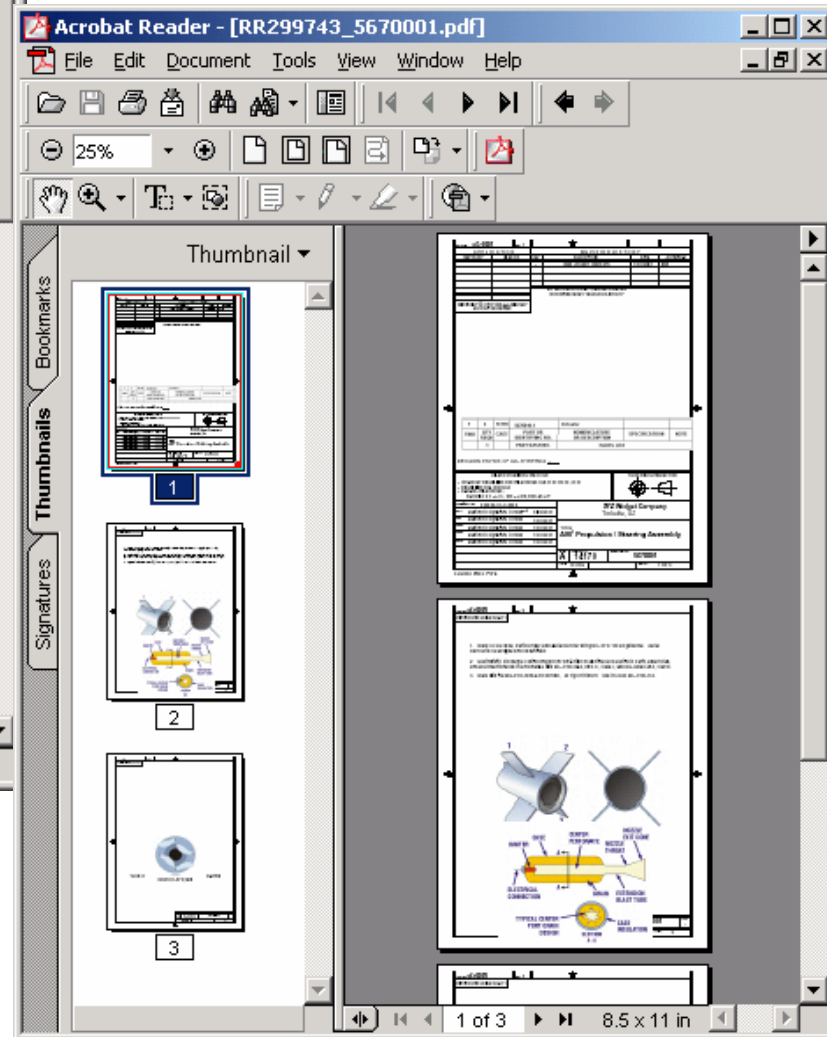
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Sheet No: **3**

8.5 x 11 in



Files packaged within the TDP



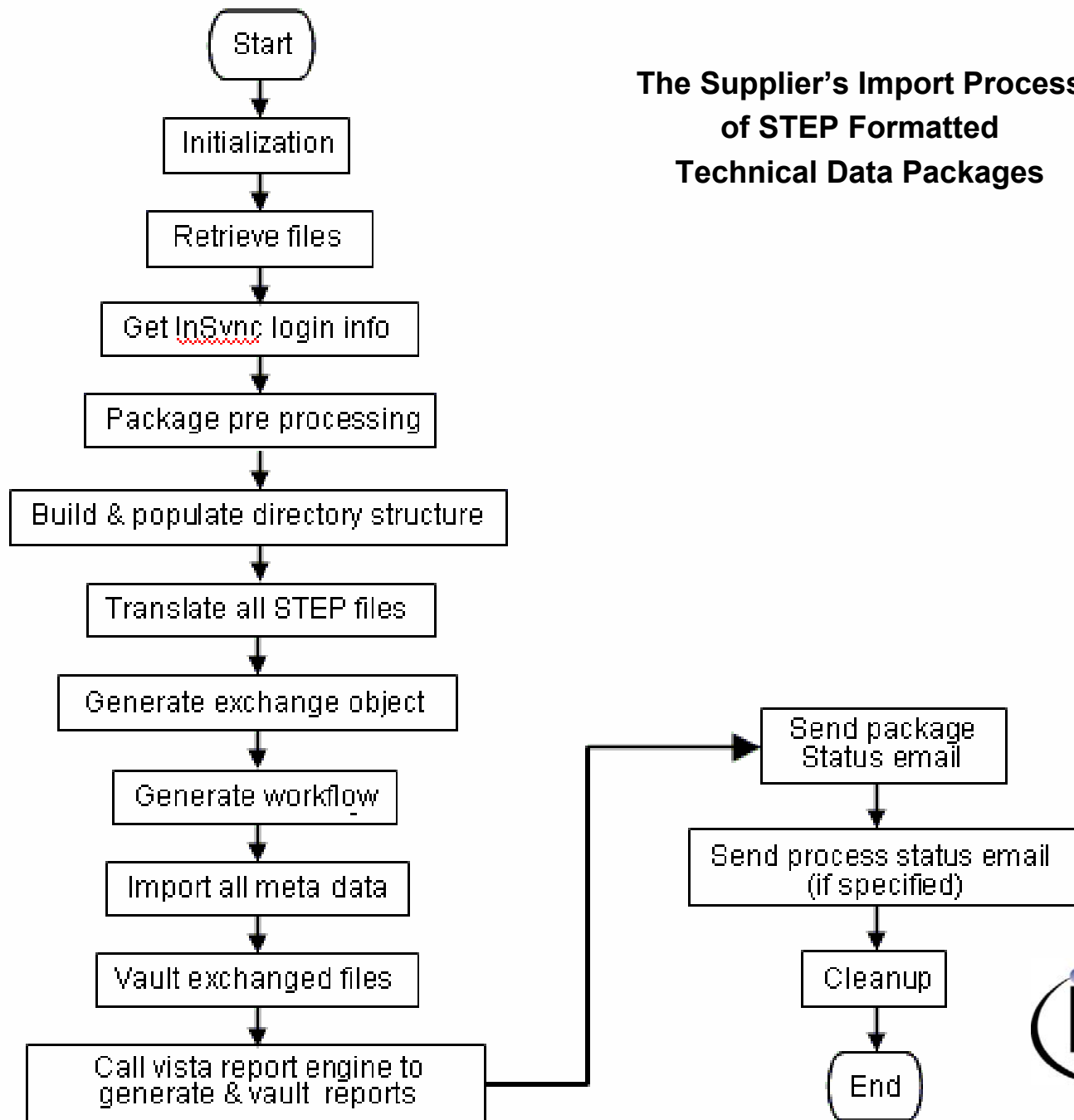
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6; #811; #812; #825; #826; #841; #842; #857; #858; #871; #872; #887; #888)); ]
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**STEP AP232
Part 21 File**

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170, P/N 5670020-1, AM3
Y 1, CAGE 14170, P/N
nbers 3 and 4. (2) Correct
CTED_ACTION('work
Assemblies and Parts. (2)

ON('document



ASDESIGNID: As-Designed Bill of Material Identification

File Edit View Screens Tools Navigator Help

As-Designed BOM w/Eff.=15

- WVW023-1;Wagon
 - WB123-1;Wagon Box
 - WH123-1;Wagon Handle
 - WHT123-1;Wagon T Handle
 - WA123-1;Wheel Assembly
 - A223-1;Axle
 - R223-1;Rim
 - RIM223-1;Fancy Rim
 - R223-1;Rim
 - T223-1;Tire
 - WC123-3;Wagon Control Computer
 - WC223-1;Wagon Computer
 - CPS323-1;Power Supply
 - HDS323-1;Hard Drive
 - CMB323-1;Mother Board
 - CPU423-1;CPU
 - RAM423-1;RAM Memory
 - CIO423-1;IO Card
 - CC423-1;Controller Card

Assy. Dwg. No. WVW023 Org. WQ123 Rev. Status APPD

Title Wagon Dwg Eff. Type SN CI Designation WWC10

Assy. Part No. WVW023-1 Org. WQ123

Name Wagon

Component Effectivity Filter
Comp. Effectivity 15

Find No.	Assy. Dwg. Re.	Comp. Part No.	Comp. Part Org.	Part Name	Qty.	UOM	Start Effectivity	End Effectivity	Alt
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2		-WH123-1	WQ123	Wagon Handle	1.0000	EA	01	SUBS	No
2		AWHT123-1	WQ123	Wagon T Handle	1.0000	EA	06	SUBS	Yes
3		-WA123-1	WQ123	Wheel Assembly	1.0000	EA	01	SUBS	No
4		BWCC123-3	WQ123	Wagon Control Computer	1.0000	EA	01	SUBS	No

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File Edit Format Help

1230001-1_14170_2001-10-02T16-26-05.fidx

STAMP Product Data Index
Data Exchange Manager (DEM)
Raytheon West

Product Structure

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N PART\2340020-1&14170\0001 (uses)
Y DOCUMENT\2340020&14170\ (desc_by)

```

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Bookmarks

Thumbnails

Signatures

1. The AF' Shows that meet the performance requirements as specified in P122001-001

2. The AF' Shows that the level of accordance with the requirements as specified in AS122001-001

3. Meet CAGE Code Part Number and Serial Number using MIL-STD-130 on part numbers. Serial Number to be assigned per requirement.

4. Document is Design Check program for production of electrical and electronic parts, assemblies and equipment that is accordance with MIL-STD-130B, Rev. C, Class 1 and MIL-STD-130C, Class 1.

5. Meet with the MIL-STD-130B/130C symbol, 33 high contrast. Use web 809 MB, STD-130.

1 2 3 4

-1

A 14170 1230001

2 of 3 8.5 x 11 in

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Thumbnails

Signatures

Thumbnail

1 2 3

1 of 3 8.5 x 11 in

**TDP Access via
Supplier's Software
Applications/Tools**

**TDP Access via
Supplier's Web Browser**

Vista Reports Main Menu

[Log Out](#)

Welcome to the Vista Reports module.

Select one of the following options to continue.

1. Run a new report
 - A. [Supplier Custom Module List \(SCML\)](#)
 - B. [Supplier Module Parts List \(SMPL\)](#)
 - C. [Parts List \(PL\)](#)
 - D. [Picture Sheet Data List \(PSDL\)](#)
 - E. [Revision Authorization Report \(RA\)](#)
 - F. [Multi-level Part BOM \(MLPart\)](#)
 - G. [Multi-level Module BOM \(MLModule\)](#)
 - H. [Multi-level SCP BOM \(MLSCP\)](#)
2. [View/Compare Report Output](#)
3. [Run Report Group](#)
4. [View License Status](#)

If you need to define one or more new Vista Report Group available on the "Vista" desktop in the JAVA client.

Request a Parts List.

[Vista Home Page](#) [Log Out](#)

Please enter the parameters and submit this page to request a task analysis report.

Select Document:

Output File: (Required)

Document ID: (Required)

Document Organization: (Required)

Document Revision: (Required)

Write to vault:

Vault Name:

**Web Browser access:
Anyone
Anywhere
Anytime**

TDP Access via
Supplier's Web Browser
HTML, XML, PDF

SUPPLIED PART DATA LIST - Microsoft Internet Explorer

Address: http://webdevp:8080/InSyncVista/reports/Users/INSTALL/616SUPPAE-900RevB.PL.html

SUPPLIED PART DATA LIST	Corporate offices Seattle, WA 98124	EXPORT CONTROL COM	CAGE 81205	NUMBER 616SUPPAE-900	REV B
LIST TITLE DESCRIPTION FIELD FOR SUPPLIED PART	ATN ATNNUMBER56789	MODEL	CONTRACT NUMBER	DATE 12-13-2002	
OWNER C. Jones PIN / ITEM 1234-1234					
REVISIONS					
REV REVISION DESCRIPTION	APPROVED DATE	CHANGE NUMBER	PHASE		CLASS
B	12-13-2002	MC 231.5	Production		
THIS IS TO TEST THE FIELD LENGTH AND VALID CHARACTER SET OF THE CHANGE IDENTIFIER REFERENCE NUMBER, IT SHOULD BE 175 CHARACTERS LONG AND ALLOW THE SPECIAL CHARACTERS = , SPACE YA900					
PART SPECIFIC DATA					
COMPONENTS					
QTY REQD	PART OR IDENTIFYING NUMBER	DESCRIPTION	NOTE TITLE NOTE		
1 EA	616SSWPAE-600 ATN ATNNUMBER98765	DESCRIPTION FIELD FOR SUPPLIED SOFTWARE			
100 EA	616SUPPAE-0909 ATN ATNNUMBER555666	DESCRIPTION FIELD FOR SUPPLIED PART			
STANDARD NOTES					

Address: http://webdevp:8080/InSyncVista/reports/vault/SI_BCA_REPORTS/SCML_616SCPPAM100~616MODPAM900_81205_5

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  <line-number type="text">00302</line-number>
  <cust-var-no type="text">YA900</cust-var-no>
  <scml-id type="text">616SCPPAM100#302B</scml-id>
  <model type="text">757</model>
  <date type="text">01-02-2003</date>
  <description type="text">DESCRIPTION FIELD FOR
SCP</description>
</header>
- <flash-form>
  <scp-kit type="text">NO</scp-kit>
</flash-form>

```

Address: http://webdevp:8080/InSyncVista/reports/vault/SI_BCA_REPORTS/SCML_616SCPPAM100~616MODPAM900_81205_5

SUPPLIER MODULE PART LIST	Corporate offices Seattle, WA 98124	EXPORT CONTROL COM	CAGE 81205	NUMBER 616SCPPAM100 MODULE NUMBER 616MODPAM900	
LIST TITLE THIS IS THE TITLE FIELD FOR A MODULE	SMPL IDENTIFIER: 616MODPAM9000000059A	MODEL 757	CONTRACT NUMBER		
OWNER Jones.Cindy@ch3500	WORK GROUP P5125	PINITEM	1234-1234		
CROSS REFERENCE					
SEE SEPARATE PICTURE SHEET DATA LIST FOR FLAGNOTES AND GEOMETRY RELATED NOTES					
SEE SEPARATE SUPPLIER CUSTOM MODULE LIST FOR MODULE LIST FOR MODULE APPLICABILITY TO AN A/P LINE NUM					
..... REVISIONS					
REVISION, CHG LEVEL, SEQUENCE	REVISION DESCRIPTION	APPROVED DATE	CHANGE NUMBER	PHASE	STATE
A	NONE	11-13-2002	PRR	23340	Production
01			123456		
-			NA		



TDP documentation

SUPPLIED PART DATA LIST - Microsoft Internet Explorer

Address: http://webdevp:8080/InSyncVista/reports/Users/INSTALL/616SUPPAE-900rev8.PL.html

SUPPLIED PART DATA LIST	Corporate offices Seattle, WA 98124	EXPORT CONTROL COM	CAGE 81205	NUMBER 616SUPPAE-90
LIST TITLE DESCRIPTION FIELD FOR SUPPLIED PART	ATN ATNNUMBER56789	MODEL	CONTRACT NUMBER	
OWNER C. Jones PIN / ITEM 1234-1234				
REVISIONS				
REV REVISION DESCRIPTION	APPROVED DATE	CHANGE NUMBER		
B	12-13-2002	MC 231.5 THIS IS TO TEST THE FIELD LENGTH AND VALID CHARACTER SET OF THE CHANGE IDENTIFIER REFERENCE NUMBER. IT SHOULD BE 175 CHARACTERS LONG AND ALLOW THE SPECIAL CHARACTERS =, SPACE YA900		
PART SPECIFIC DATA				
COMPONENTS				
QTY REQD	PART OR IDENTIFYING NUMBER	DESCRIPTION	NOTE TITLE	NOTE DESCRIPTION
1 EA	616SSWPAE-600 ATN ATNNUMBER98765	DESCRIPTION FIELD FOR SUPPLIED SOFTWARE		
100 EA	616SUPPAE-900 ATN ATNNUMBER55666	DESCRIPTION FIELD FOR SUPPLIED PART		
STANDARD NOTES				

SUPPLIED PART DATA LIST - Microsoft Internet Explorer

Address: http://webdevp:8080/InSyncVista/reports/Users/INSTALL/616SUPPAE-900rev8.PL.html

SUPPLIED PART DATA LIST	Corporate offices Seattle, WA 98124	EXPORT CONTROL COM	CAGE 81205	NUMBER 616SUPPAE-900	REV B
LIST TITLE DESCRIPTION FIELD FOR SUPPLIED PART	ATN ATNNUMBER56789	MODEL	CONTRACT NUMBER	DATE 12-13-2002	
OWNER C. Jones PIN / ITEM 1234-1234					
REVISIONS					
REV REVISION DESCRIPTION	APPROVED DATE	CHANGE NUMBER	PHASE	CLASS	
B	12-13-2002	MC 231.5 THIS IS TO TEST THE FIELD LENGTH AND VALID CHARACTER SET OF THE CHANGE IDENTIFIER REFERENCE NUMBER. IT SHOULD BE 175 CHARACTERS LONG AND ALLOW THE SPECIAL CHARACTERS =, SPACE YA900	Production		
PART SPECIFIC DATA					
COMPONENTS					
QTY REQD	PART OR IDENTIFYING NUMBER	DESCRIPTION	NOTE TITLE	NOTE DESCRIPTION	

Supplier Custom Module List - Microsoft Internet Explorer

Address: http://webdevp:8080/InSyncVista/reports/vault/ST_BCA_REPORTS/SCML_616SCPPAM100~302~YA900_81205_SCM_~~~~~B.xml_ST_BCA_REPORTS_SCML_6_

SUPPLIER CUSTOM MODULE LIST	Corporate offices Seattle, WA 98124	EXPORT CONTROL COM	CAGE 81205	NUMBER 616SCPPAM100	REV A B
LIST TITLE DESCRIPTION FIELD FOR SCP	SCML IDENTIFIER 616SCPPAM100#302A 616SCPPAM100#302B	MODEL 757	CONTRACT NUMBER	LINE NO 00302	DATE 12-07-2002 01-02-2003
CUST VAR NO YA900					
Legend:					
Changed					
Added					
Removed					
SCP-KIT NO					
AIRPLANE SPECIFIC DATA					
MODULE APPLICABILITY DATA					
MODULE NUMBER	DESCRIPTION	REVISION	CHANGE LEVEL	PHASE	STATE SEQUENCE
616MODPAM100	THIS IS THE TITLE FIELD FOR A MODULE	A	01	Production	APPD __
616MODPAM200	THIS IS THE TITLE FIELD FOR A MODULE	A	01	Developmental	APPD 02
616MODPAM300	THIS IS THE TITLE FIELD FOR A MODULE	A	01	Production	APPD 02
616MODPAM900	THIS IS THE TITLE FIELD FOR A MODULE	A	01	Production	APPD __
616EMODPAM900	THIS IS THE TITLE FIELD FOR EXCEPTION MODULE EXCEPTION MODULE AFFECTS 616MODPAM900		01	Production	APPD ==
NET CHANGE					

DM Analysis Tools:
Parameter searches
Multi-level Views
Links to reports
Multi-level & Single-level comparisons

TDP with a Multi-level view and linked reports.

Multi-level Bill of Materials - Microsoft Internet Explorer

Address: http://webdevp:8080/InSyncVista/reports/Users/INSTALL/6165CPPAM100~302~YA900RevA.SCMLMulti.html

MULTI-LEVEL SUPPLIER CUSTOM PART	BOEING Corporate offices Seattle, WA 98124	CAGE 81205	DOC NUMBER 6165CPPAM100,302,YA900 PART NUMBER 6165CPPAM100	DOC REV A
ITEM CAT supplier custom part	VAULT SI_BCA_REPORTS		DATE Fri Jan 17 13:43:47 EST 2003	
ITEM NAME	FILE SCML_6165CPPAM100-302-YA900_81205_SCM_.....A.pdf			

PART	RPT	CAGE	LINE #	NAME	CATAGORY	REV	VIEW	QTY
616MODPAM900	The Boeing Company	-	-	THIS IS THE TITLE FIELD FOR A MODULE	module	A :01	M	
... Exception Modules								
... Engineering Definition								
616EGPPAE900	The Boeing Company	-	1	DESCRIPTION FIELD FOR ENGINEERING PART	part	A :01	E	1.0000 EA
616EGPPAE500	The Boeing Company	-	2	DESCRIPTION FIELD FOR ENGINEERING PART				
616STPPAE100	The Boeing Company	-	5	DESCRIPTION FIELD FOR STANDARD PART				
616EGPPAE300	The Boeing Company	-	7	DESCRIPTION FIELD FOR ENGINEERING PART				
616EGPPAE300	The Boeing Company	-	8	DESCRIPTION FIELD FOR ENGINEERING PART				
... Manufacturing Definition								
616MODPAM100	The Boeing Company	-	-	THIS IS THE TITLE FIELD FOR A MODULE				
... Engineering Definition								
616EGPPAE100	The Boeing Company	-	1	DESCRIPTION FIELD FOR ENGINEERING PART				
616STPPAE100	The Boeing Company	-	2	DESCRIPTION FIELD FOR STANDARD PART				
... Manufacturing Definition								
616MODPAM200	The Boeing Company	-	-	THIS IS THE TITLE FIELD FOR A MODULE				

Address: http://webdevp:8080/InSyncVista/reports/vault/SI_BCA_REPORTS/SMPL_6165CPPAM100~616MODPAM900_812 - Micro...

Address: http://webdevp:8080/InSyncVista/reports/vault/SI_BCA_REPORTS/SMPL_6165CPPAM100~616MODPAM900_81205_SMPE_...

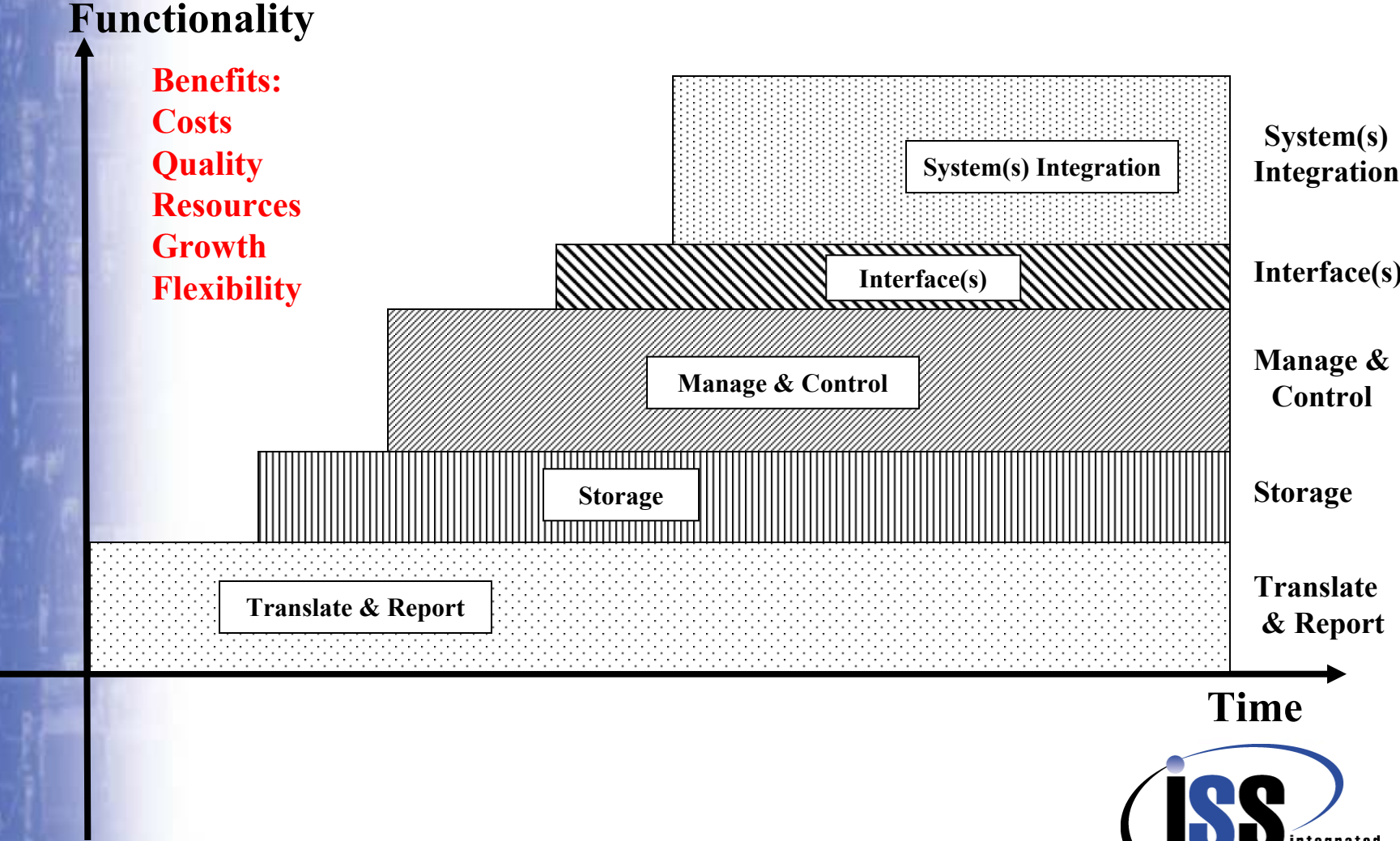
91%

SUPPLIER MODULE PART LIST	BOEING Corporate offices Seattle, WA 98124	EXPORT CONTROL CODE	CAGE 81205	NUMBER 6165CPPAM100,302,YA900 WEB FILE NUMBER 6165CPPAM100	REV A / 01	SHEET 1 OF 7
LIST TITLE THIS IS THE TITLE FIELD FOR A MODULE	SMPL IDENTIFIER 6165CPPAM1000000005A		MODEL 757	CONTRACT NUMBER	DATE 11-13-2002	
OWNER Jones,Cindy(cj)500	WORK GROUP P5125	PIN/ITEM 1234-1234	KIT SCP? No			
CROSS REFERENCE						
SEE SEPARATE PICTURE SHEET DATA LIST FOR FLAGNOTES AND GEOMETRY RELATED NOTES						
SEE SEPARATE SUPPLIER CUSTOM MODULE LIST FOR MODULE LIST FOR MODULE APPLICABILITY TO AN A/P LINE NUMBER						
..... REVISIONS						
REVISION, CHG LEVEL, SEQUENCE	REVISION DESCRIPTION	APPROVED DATE	CHANGE NUMBER	PHASE	STATE	
A	NONE	11-13-2002	PER 2340	Production	APPD	
01			123456			
-			NA			

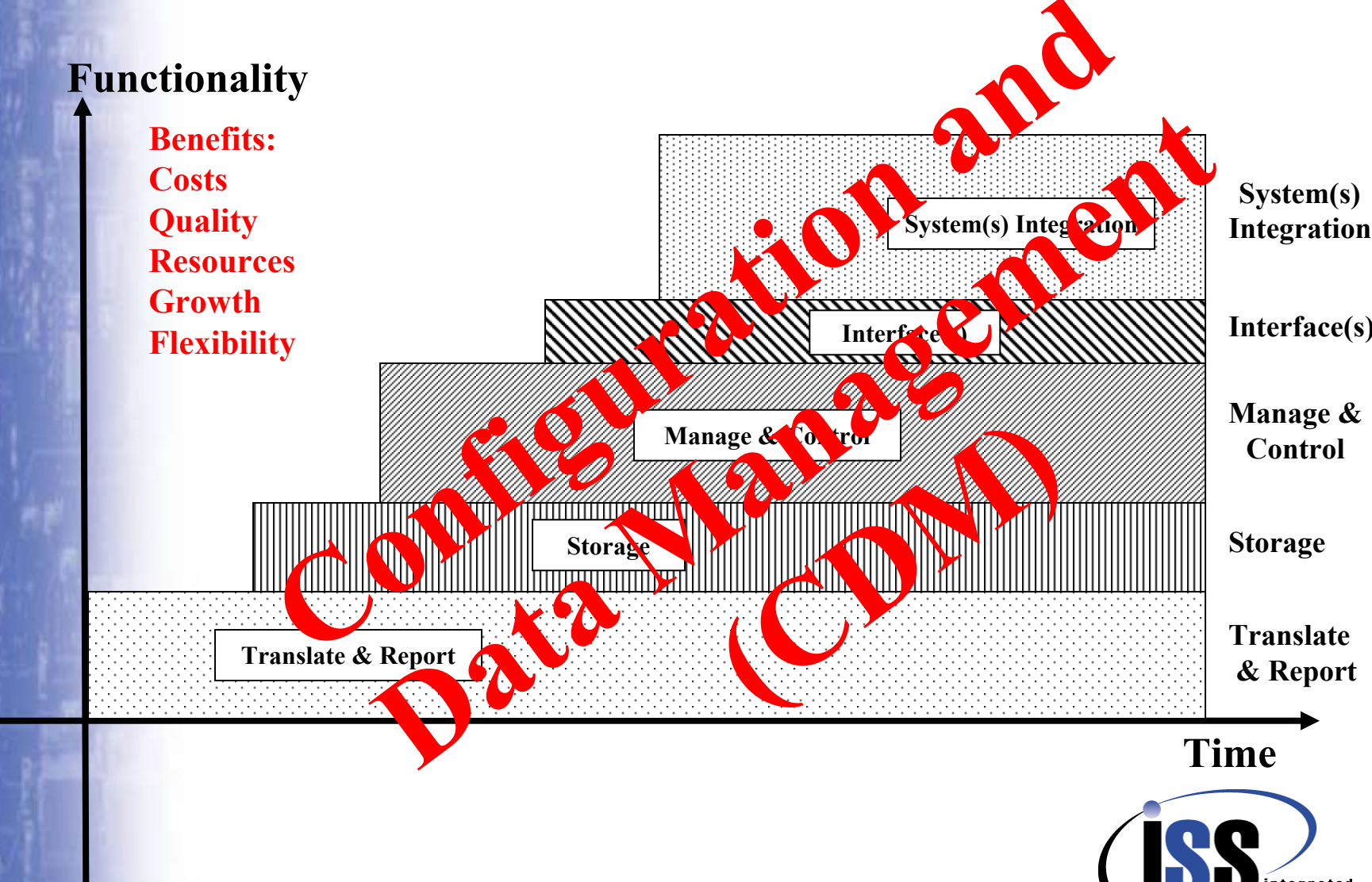
1 of 7 11.03 x 8.46 in

DM Analysis Tools:
Parameter searches
Multi-level views
Linked access to reports
Multi-level & single-level comparisons

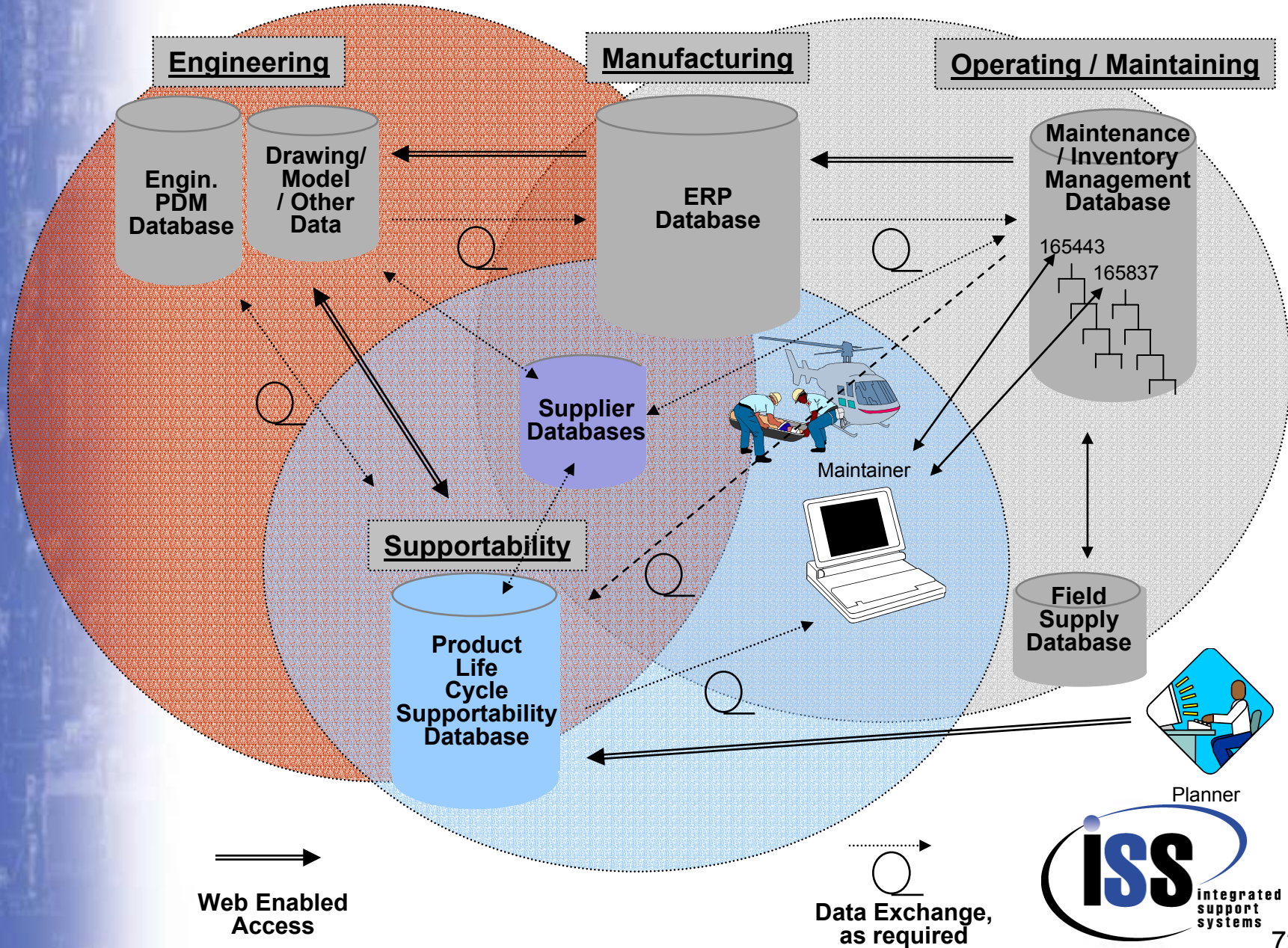
Enterprise Supply Chain Digital Data Implementation Planning



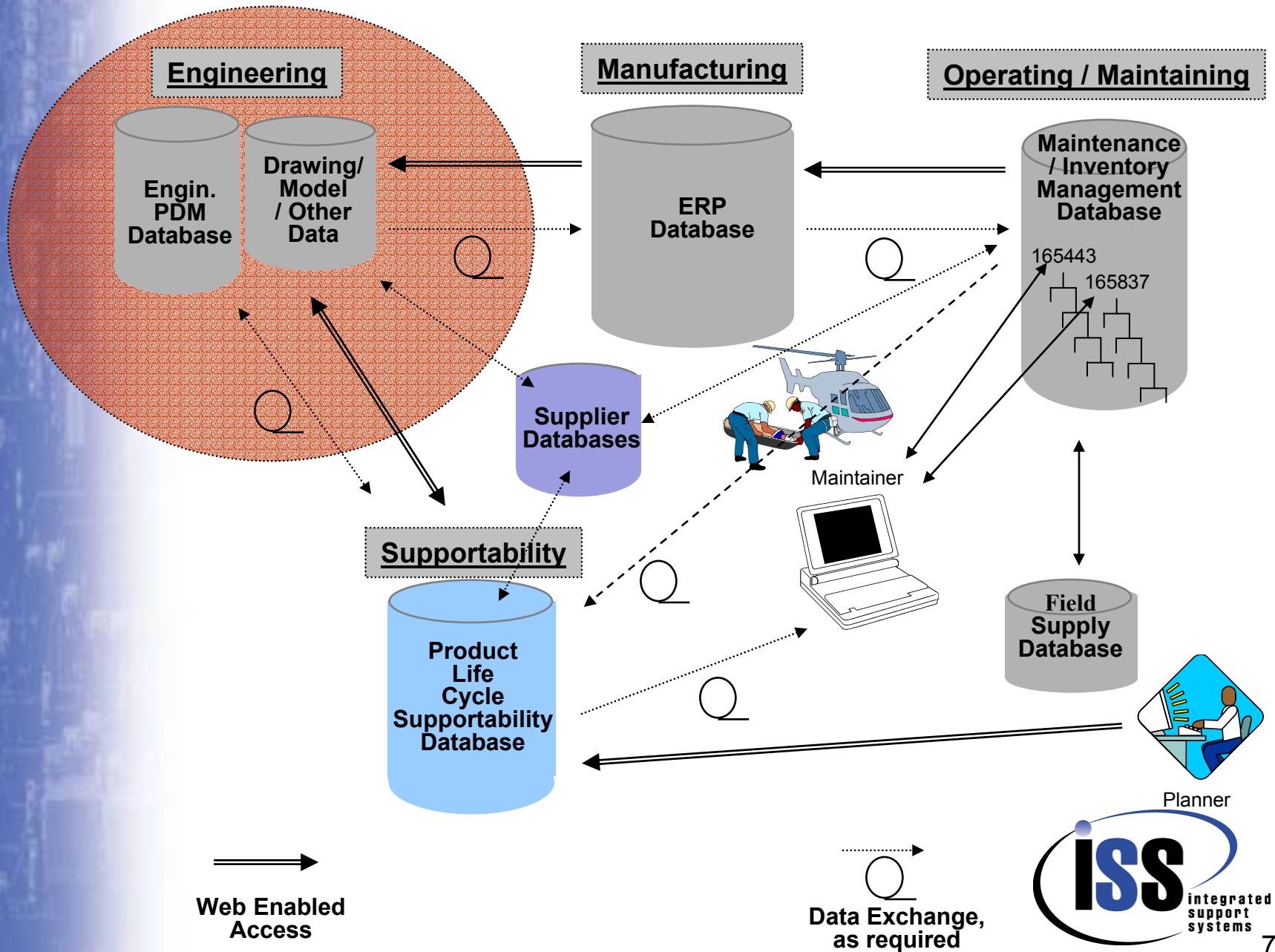
Enterprise Supply Chain Digital Data Implementation Planning



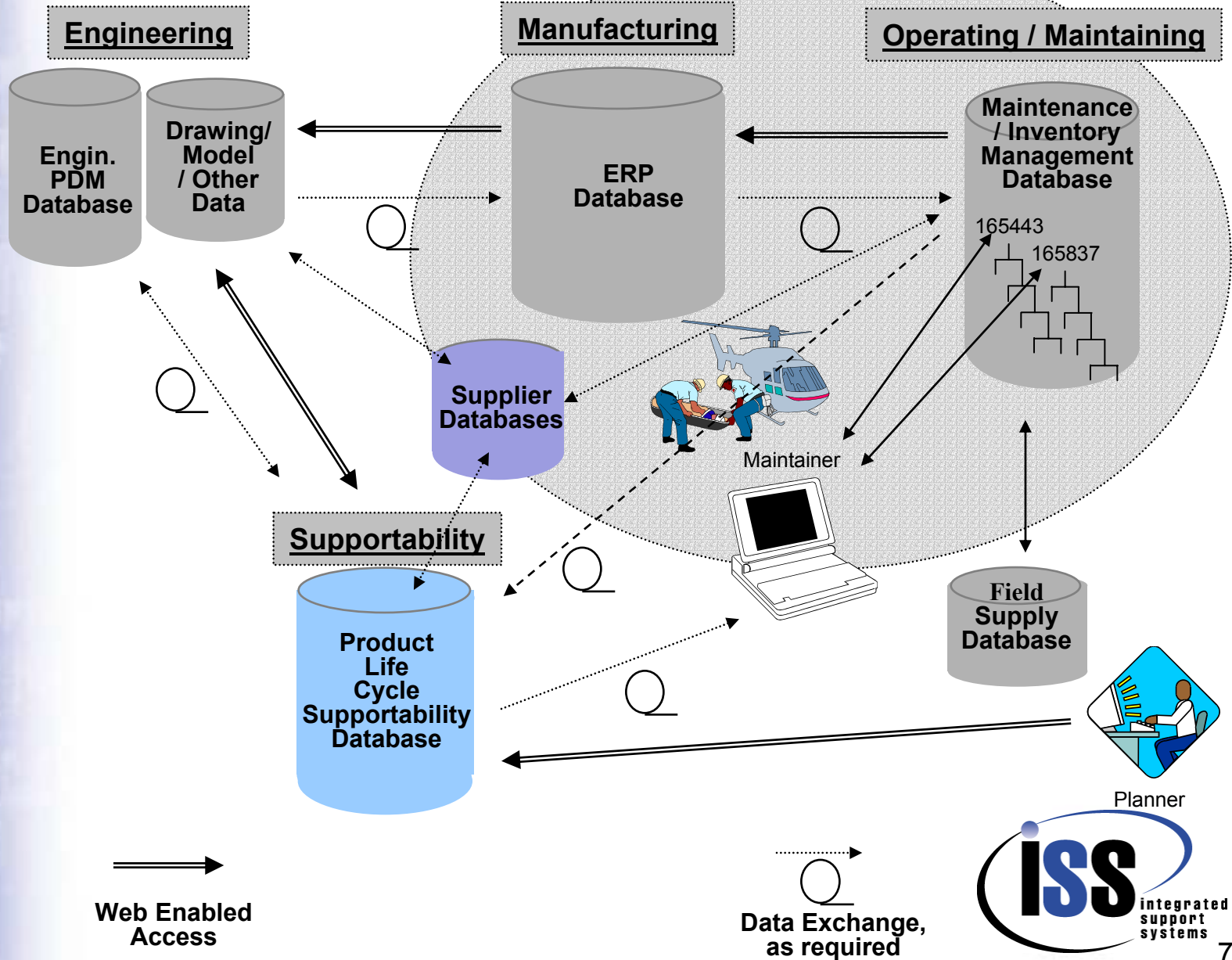
Supply Chain Dynamics, Life Cycle Data Evolution



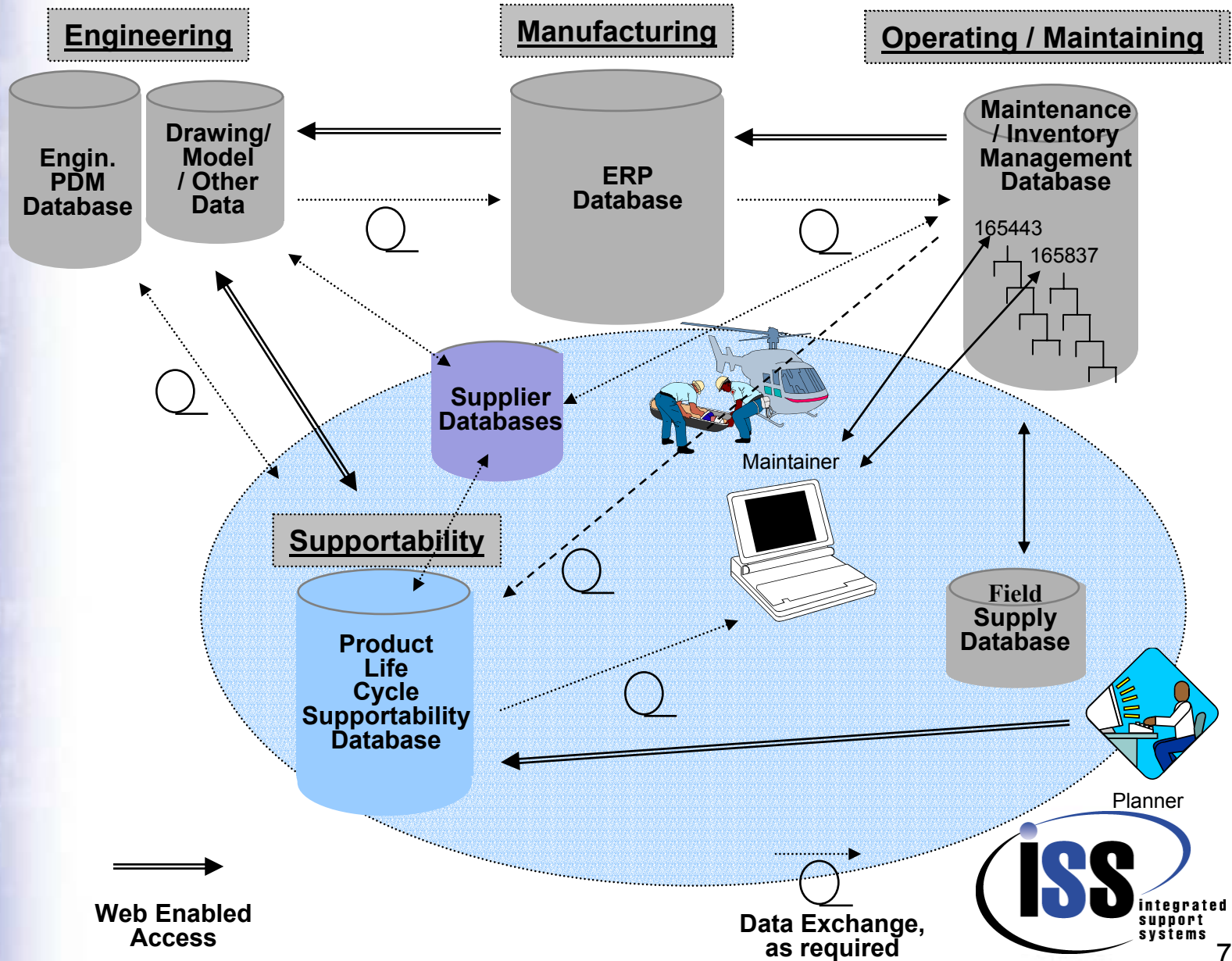
Supply Chain Dynamics, Life Cycle Data Evolution



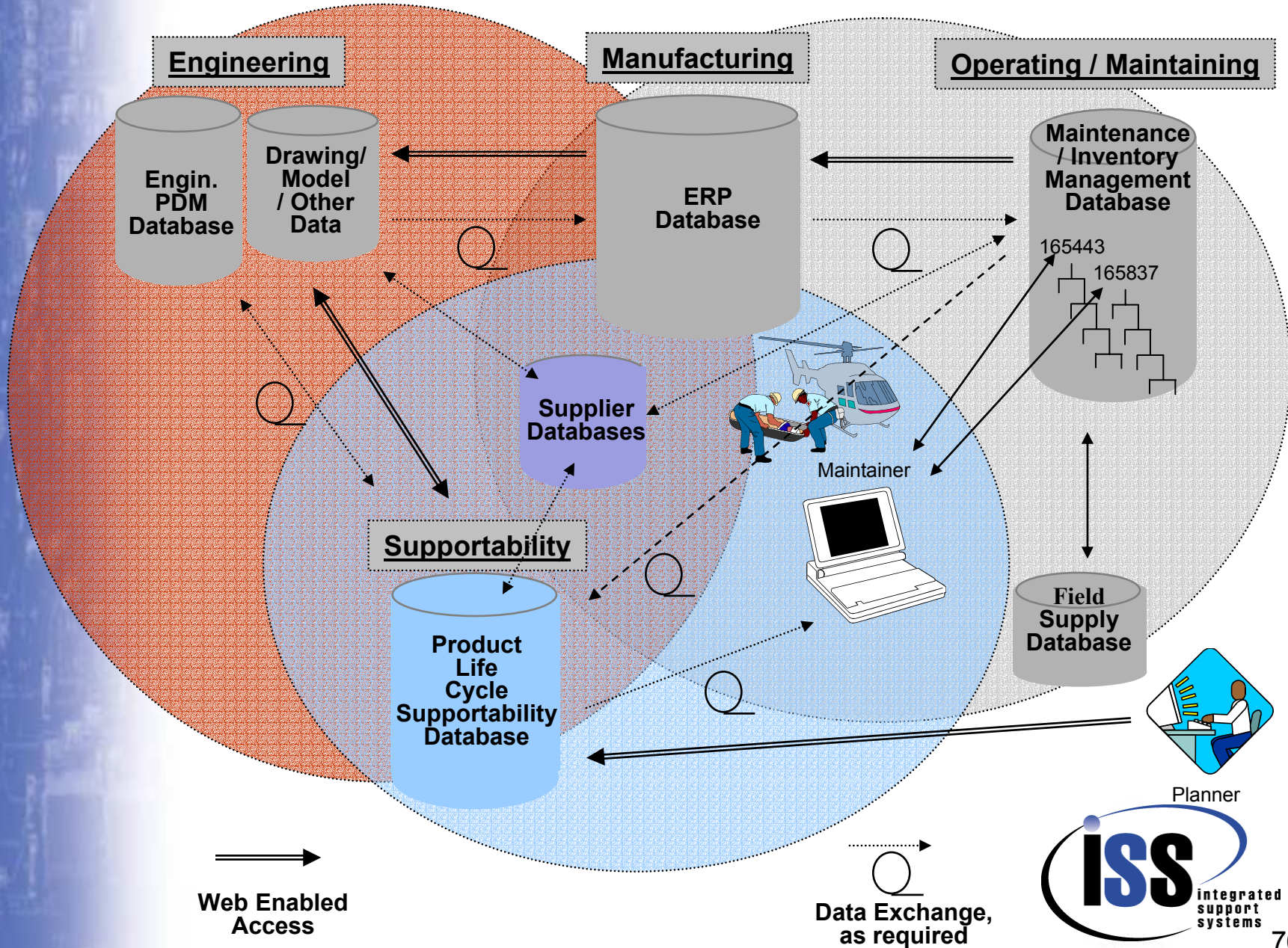
Supply Chain Dynamics, Life Cycle Data Evolution



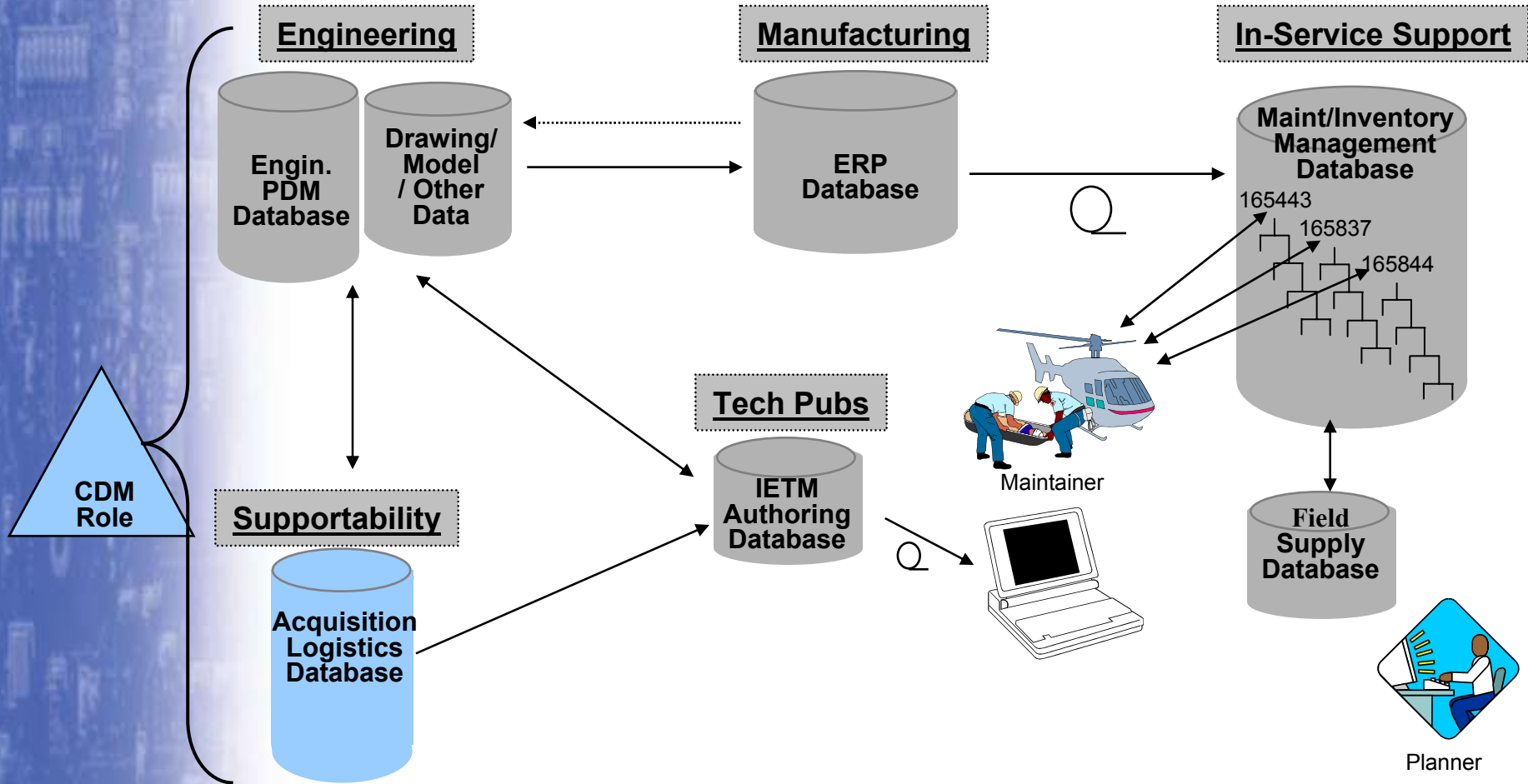
Supply Chain Dynamics, Life Cycle Data Evolution



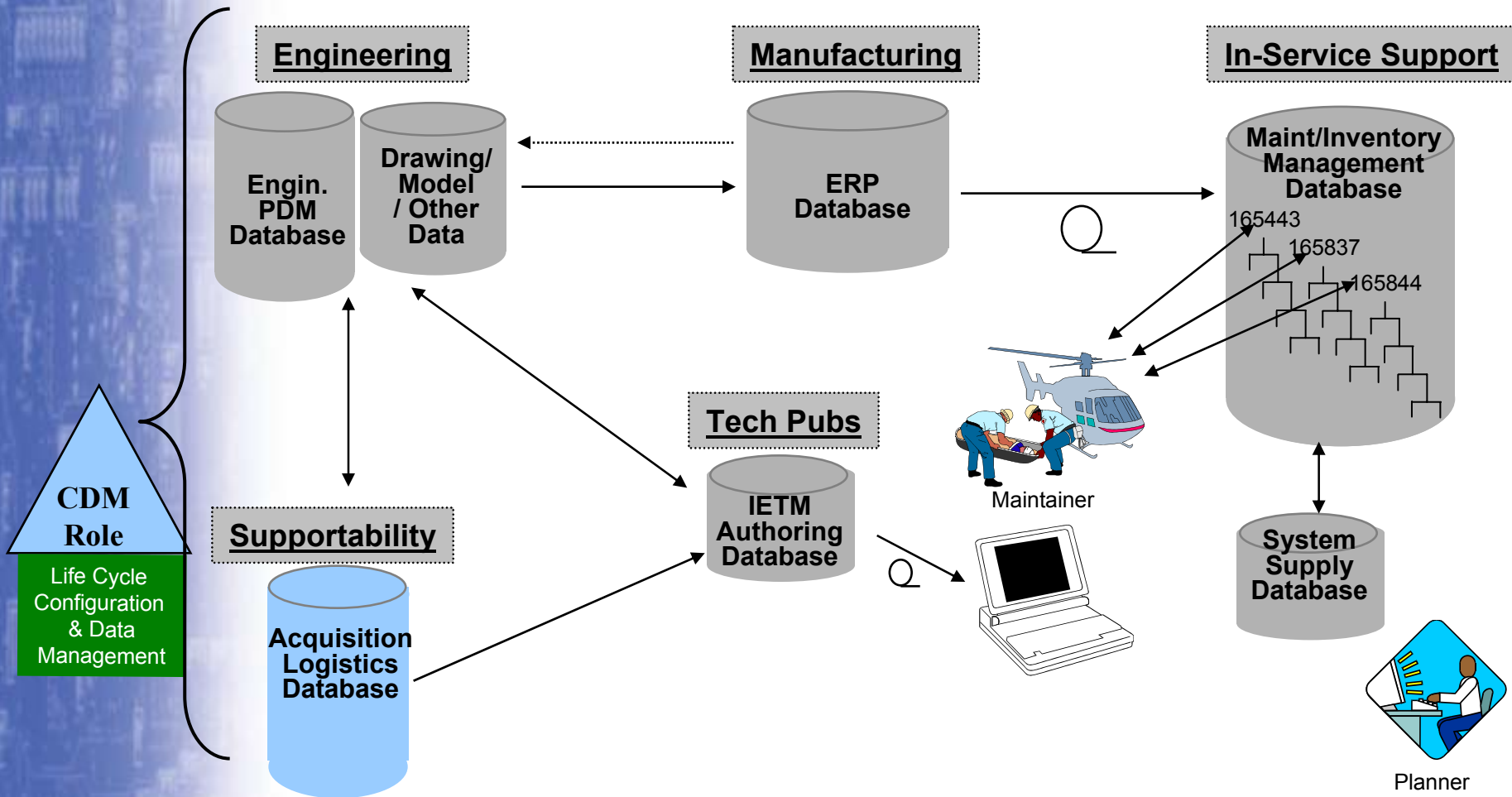
Supply Chain Dynamics, Life Cycle Data Evolution



Typical Life Cycle Data/Process Interaction



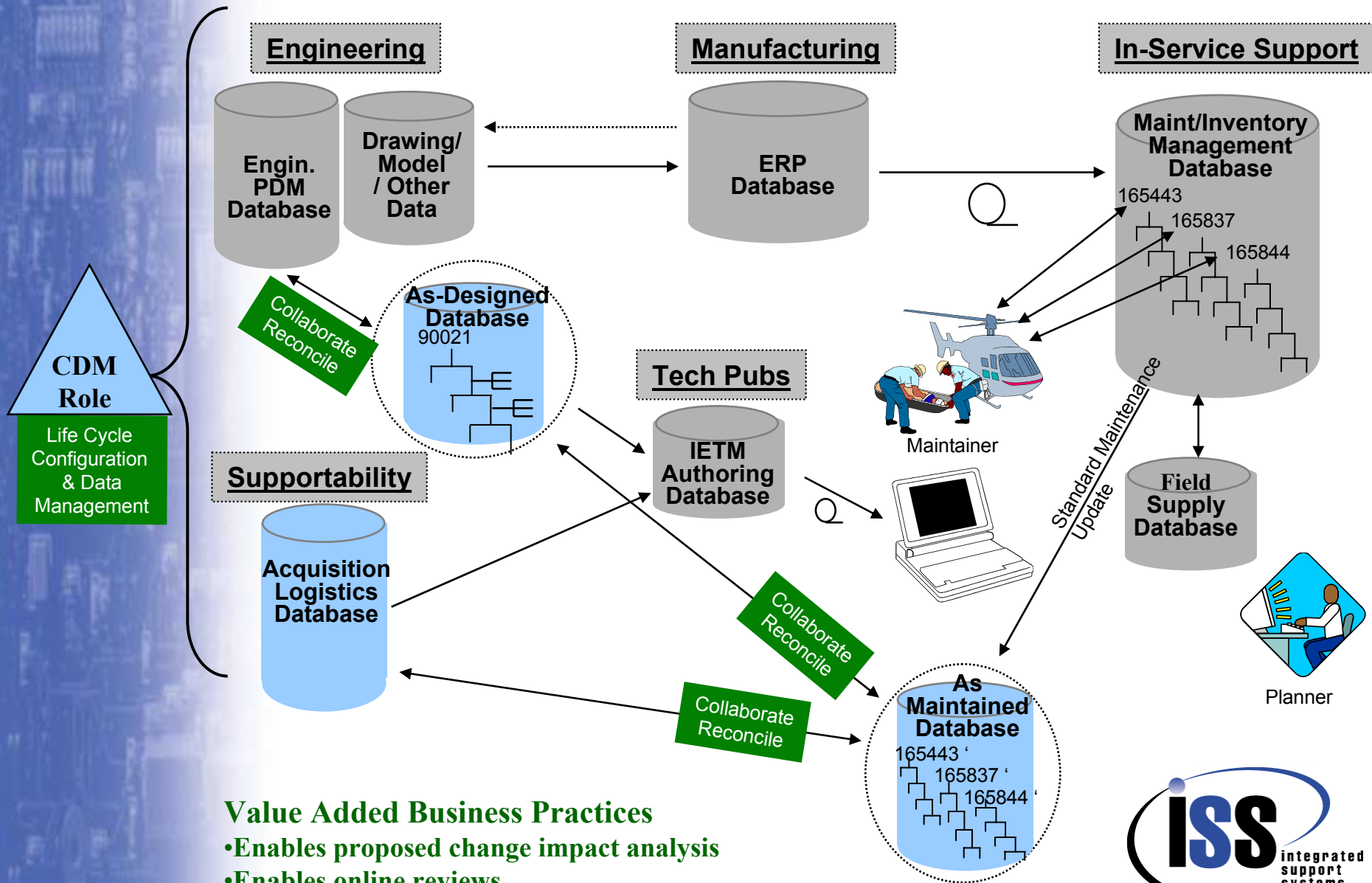
Life Cycle Configuration Data Management



Value Added Business Practices

- Full visibility of proposed design changes and implemented changes in service
- Accurate baseline documents evolution (history of change)
- Accessible audit trail of configuration change

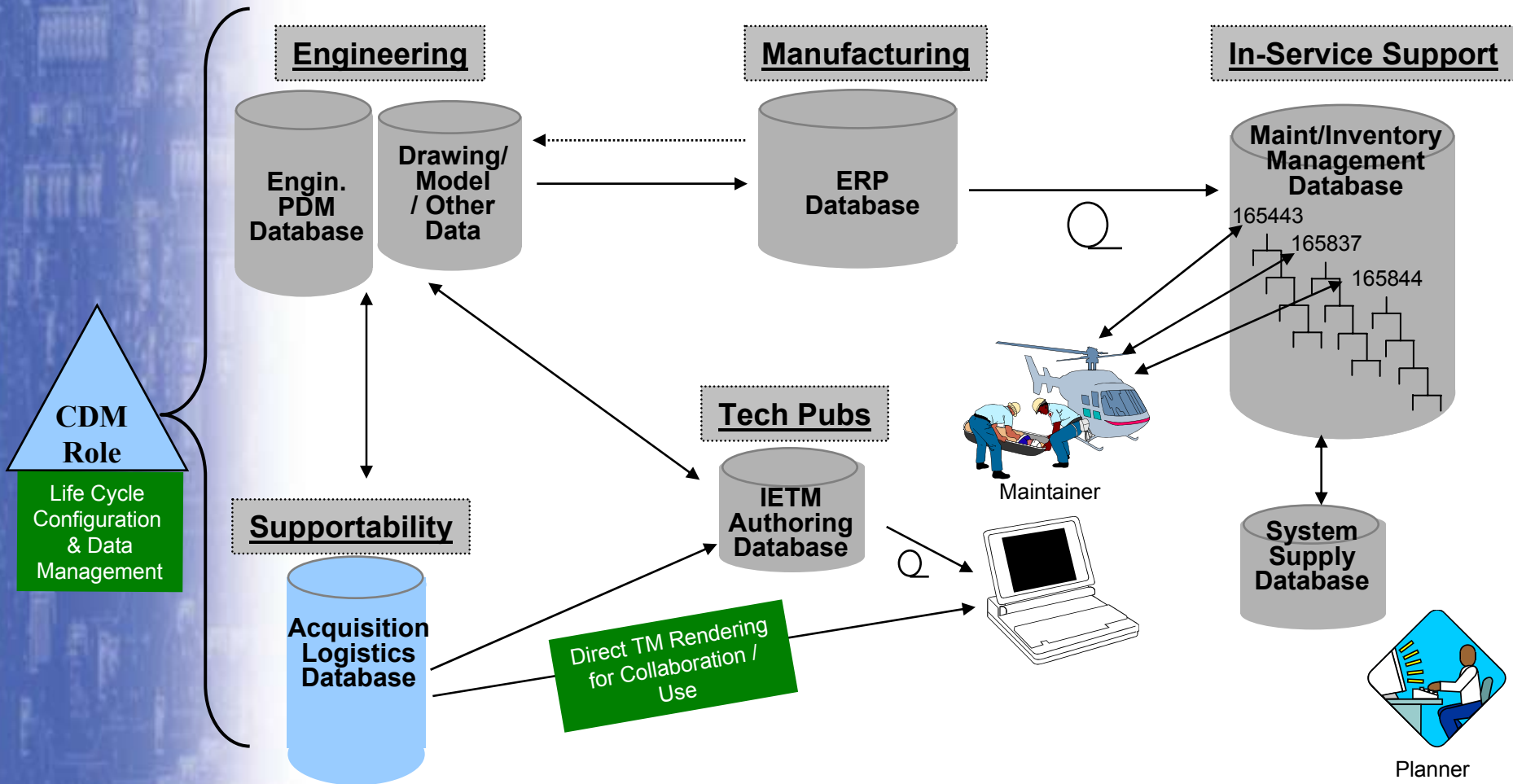
Collaboration & Reconciliation of Service Data



Value Added Business Practices

- Enables proposed change impact analysis
- Enables online reviews
- Enables “life cycle” product structure comparisons for exception reporting

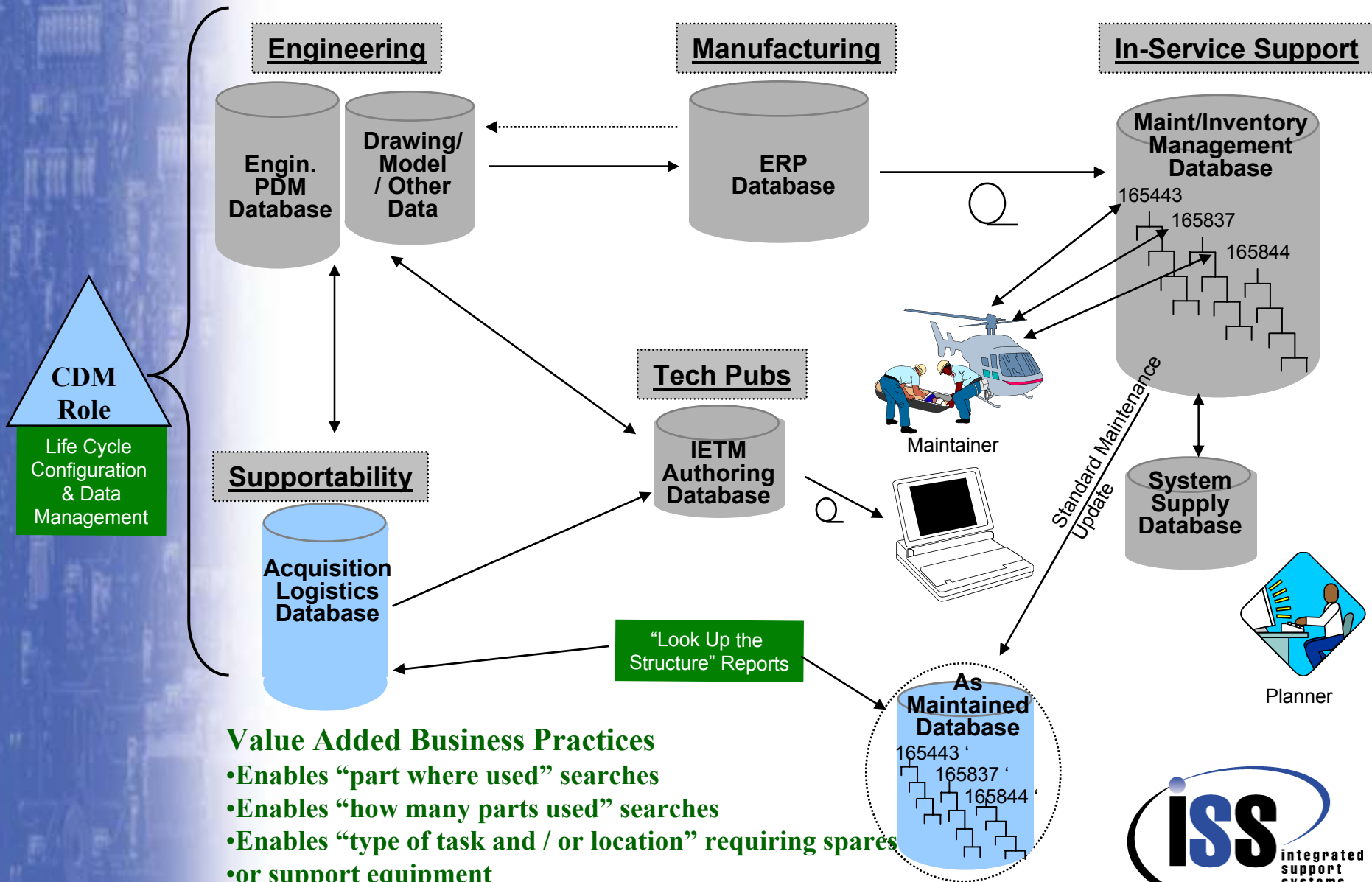
Collaboration & Reconciliation of O&M Data



Value Added Business Practices

- Supportability data may be rendered in “ETM” views to enable collaboration and change impact analysis
- Supportability data could be used as the single source repository for ETM / IETM requirements. No need for a “redundant data repository.”

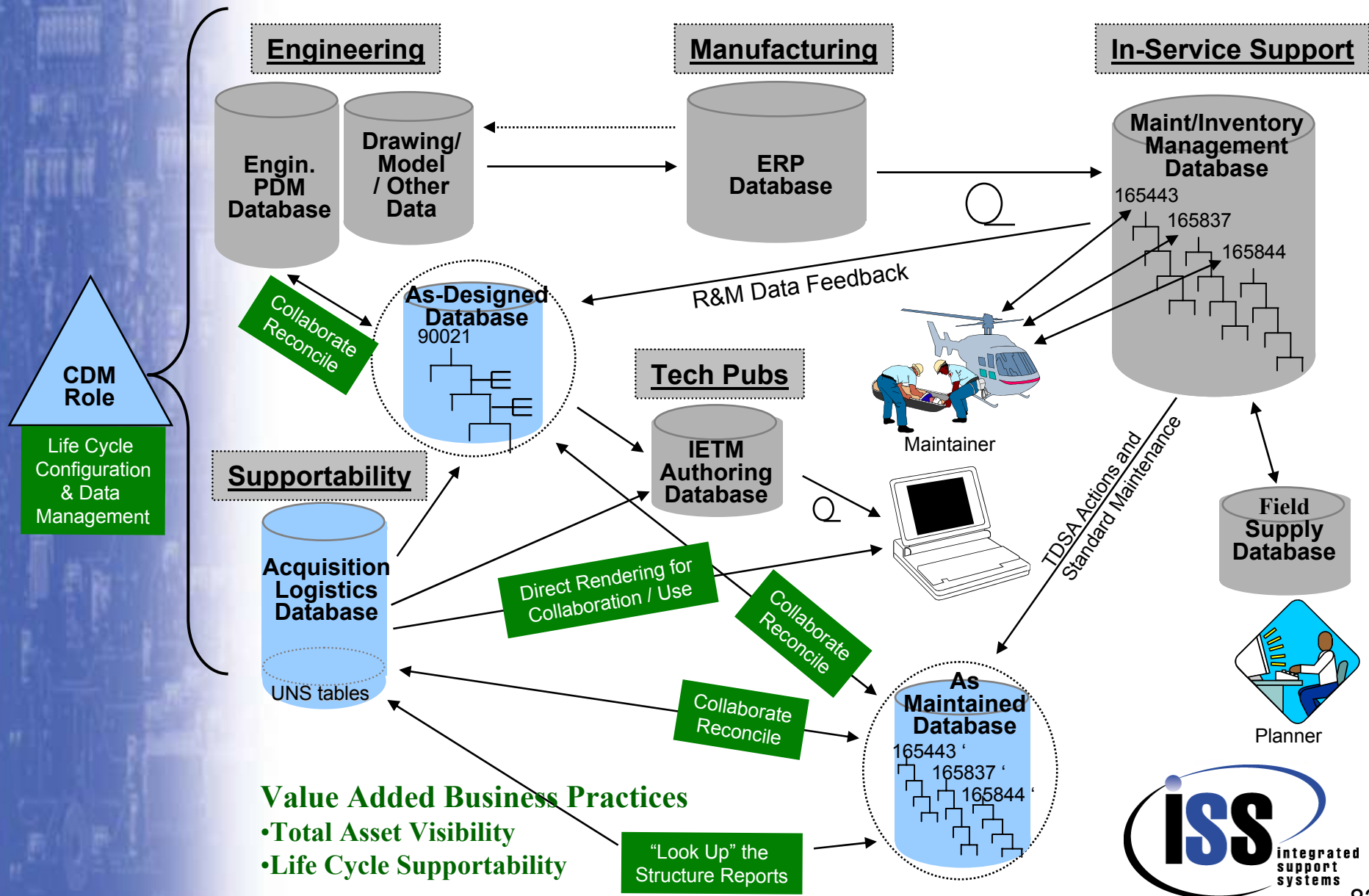
Collaboration & Reconciliation of Use Data



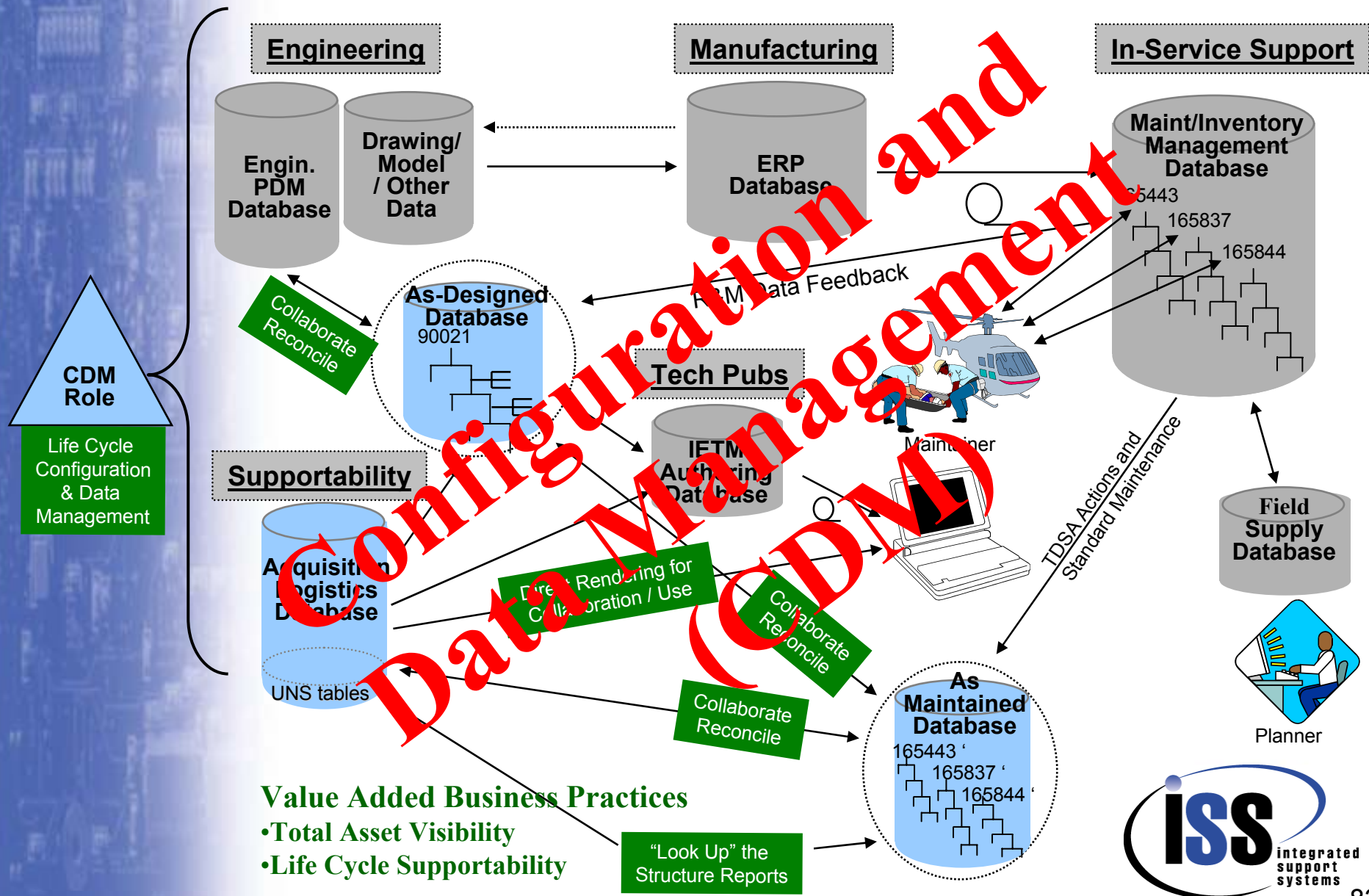
Value Added Business Practices

- Enables “part where used” searches
- Enables “how many parts used” searches
- Enables “type of task and / or location” requiring spares or support equipment
- Enables identification of availability of spares

Life Cycle Supportability & Total Asset Visibility



Life Cycle Supportability & Total Asset Visibility



Summary

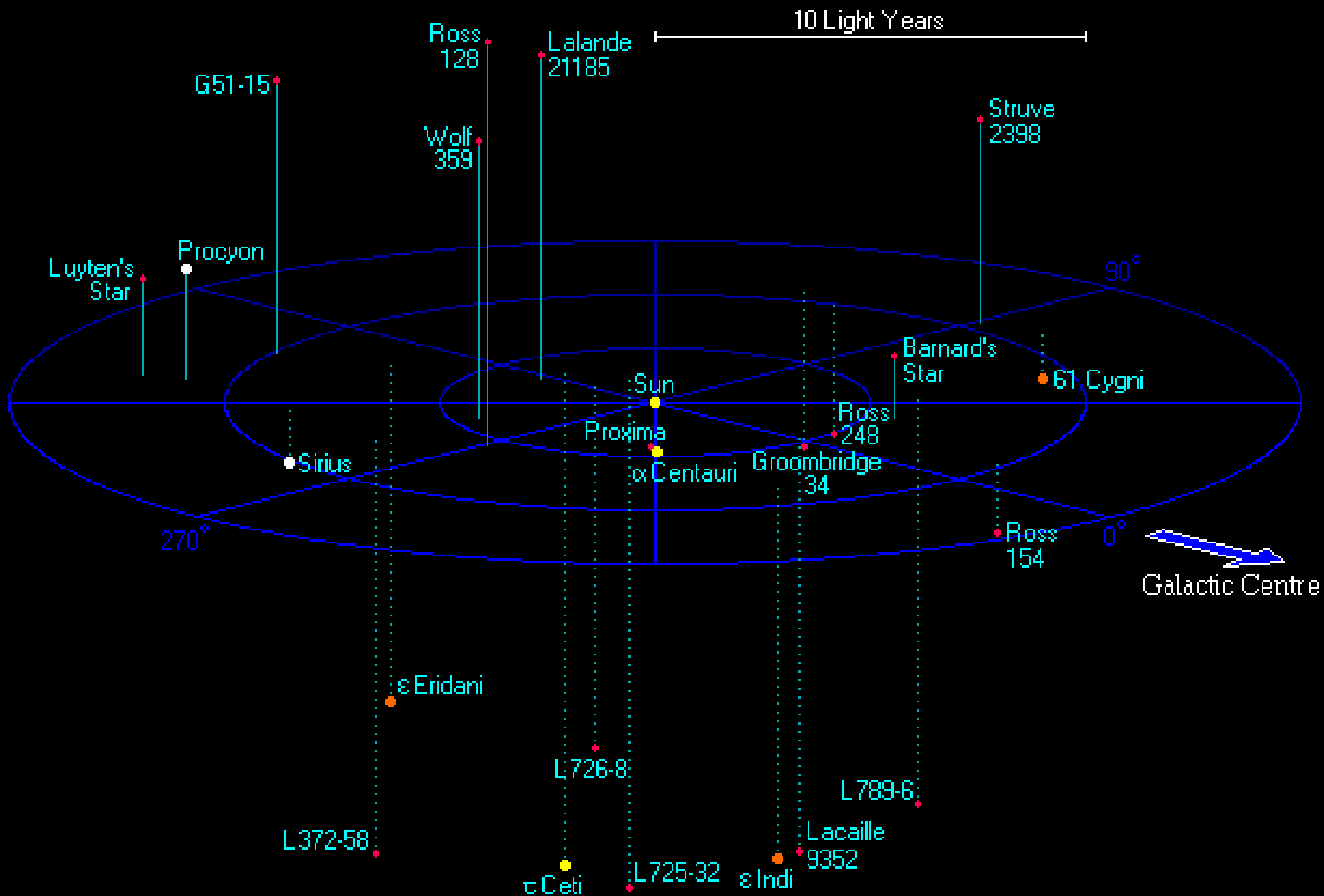
- Information is the key to value chain
- CDM is key to “right” information
- CDM required Womb to Tomb
- CDM required Top to Bottom

The CDM Role

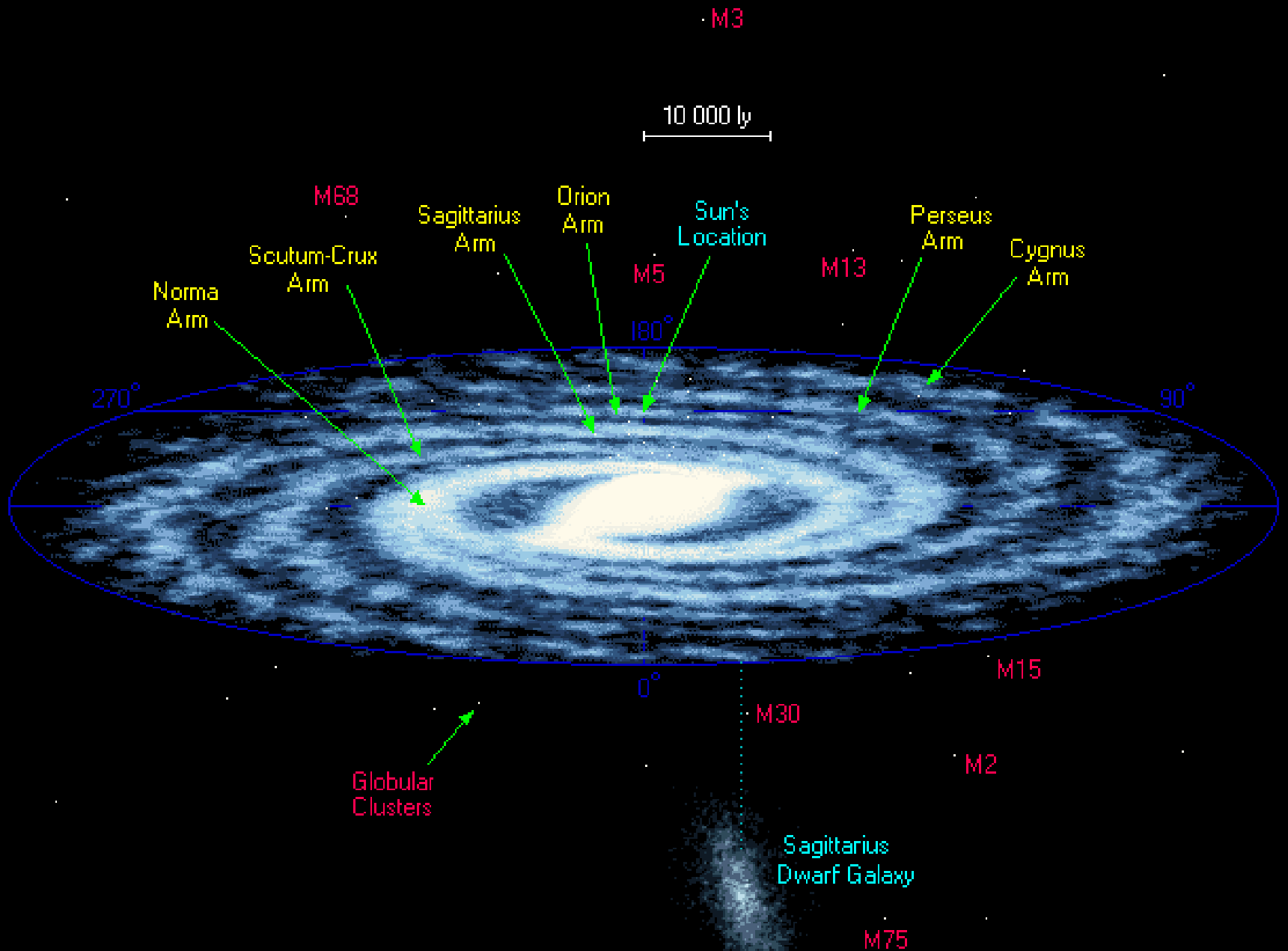


The Center of Universe

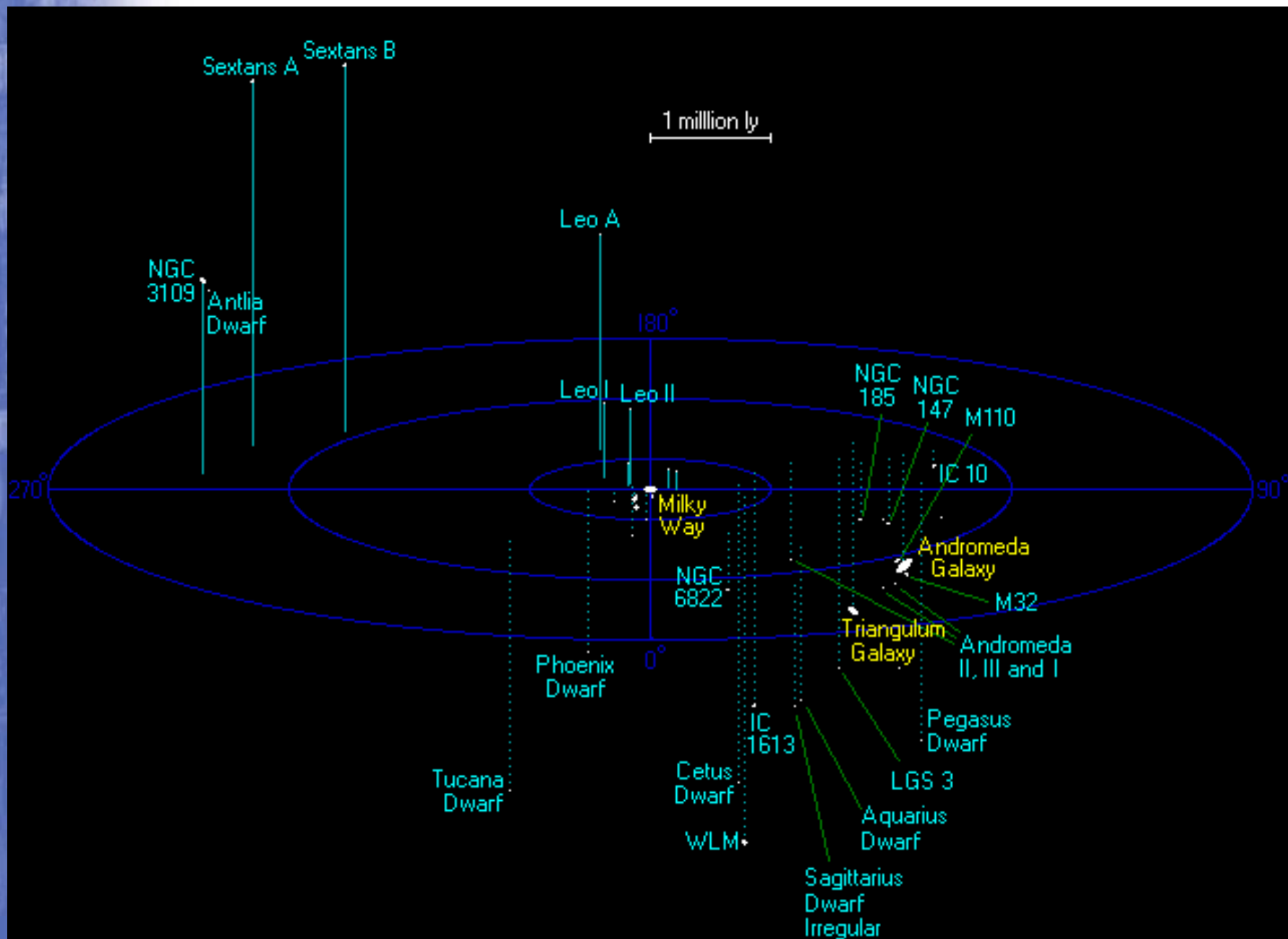
The Nearest Stars



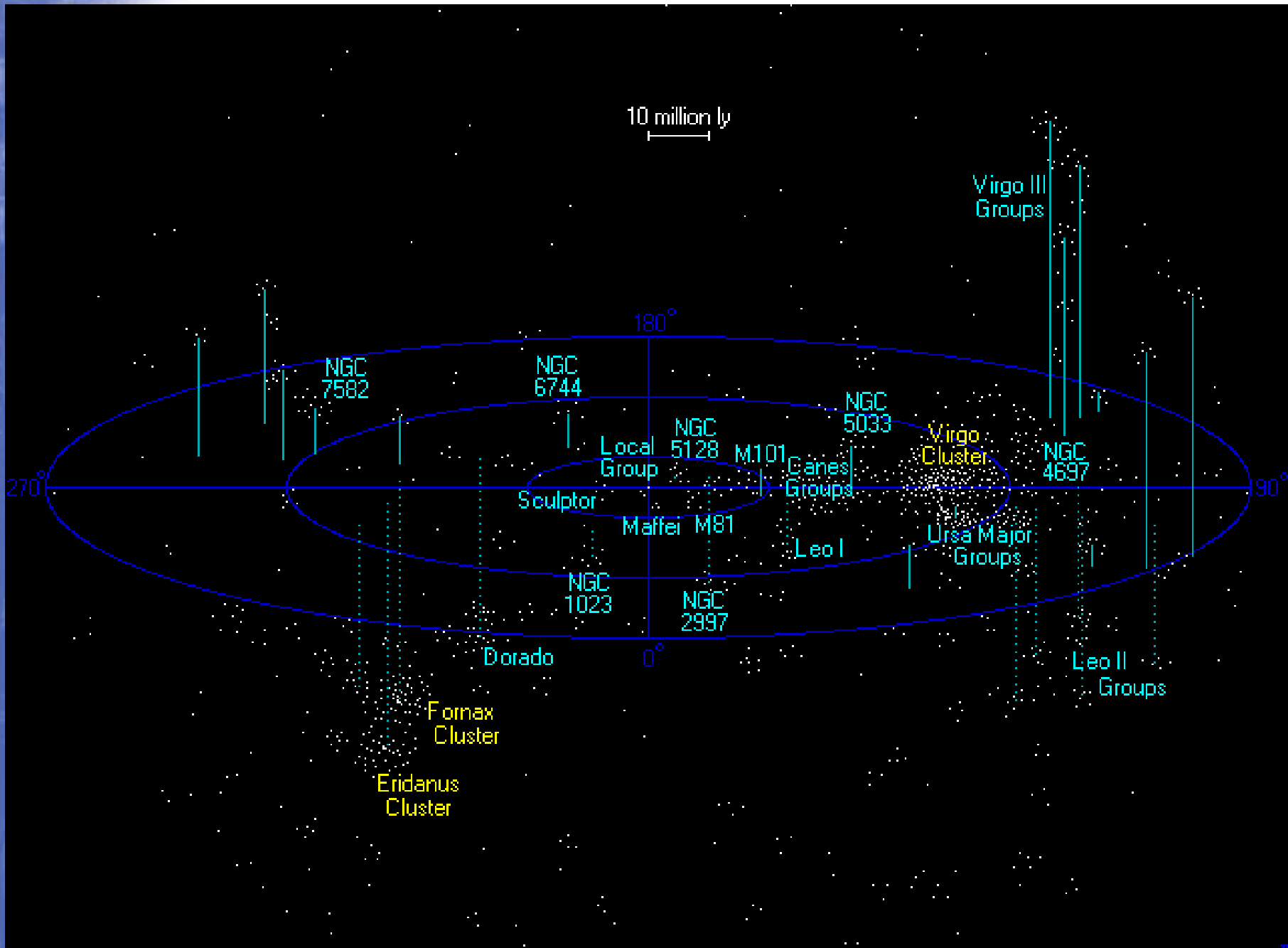
The Milky Way Galaxy



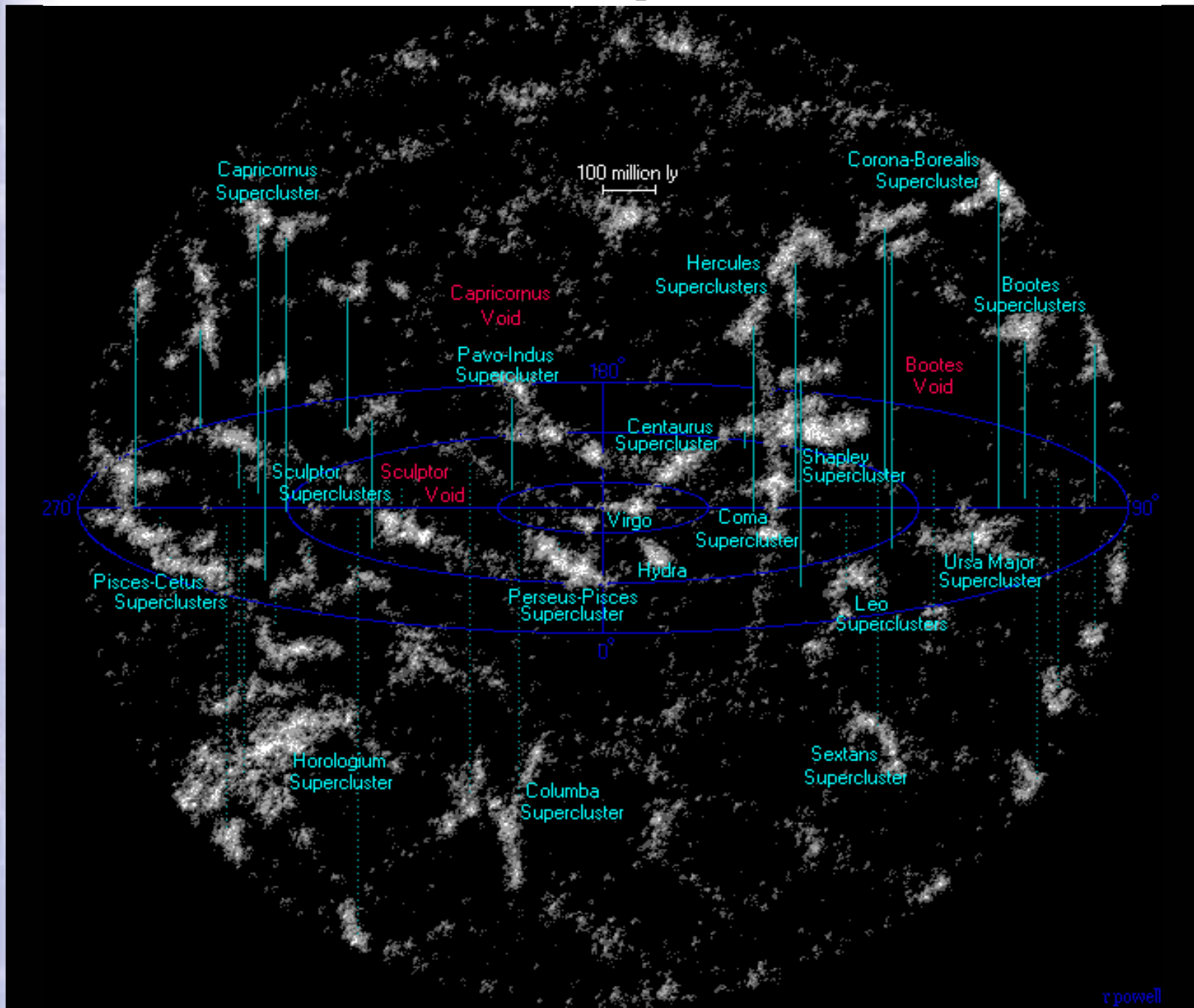
The Local Group



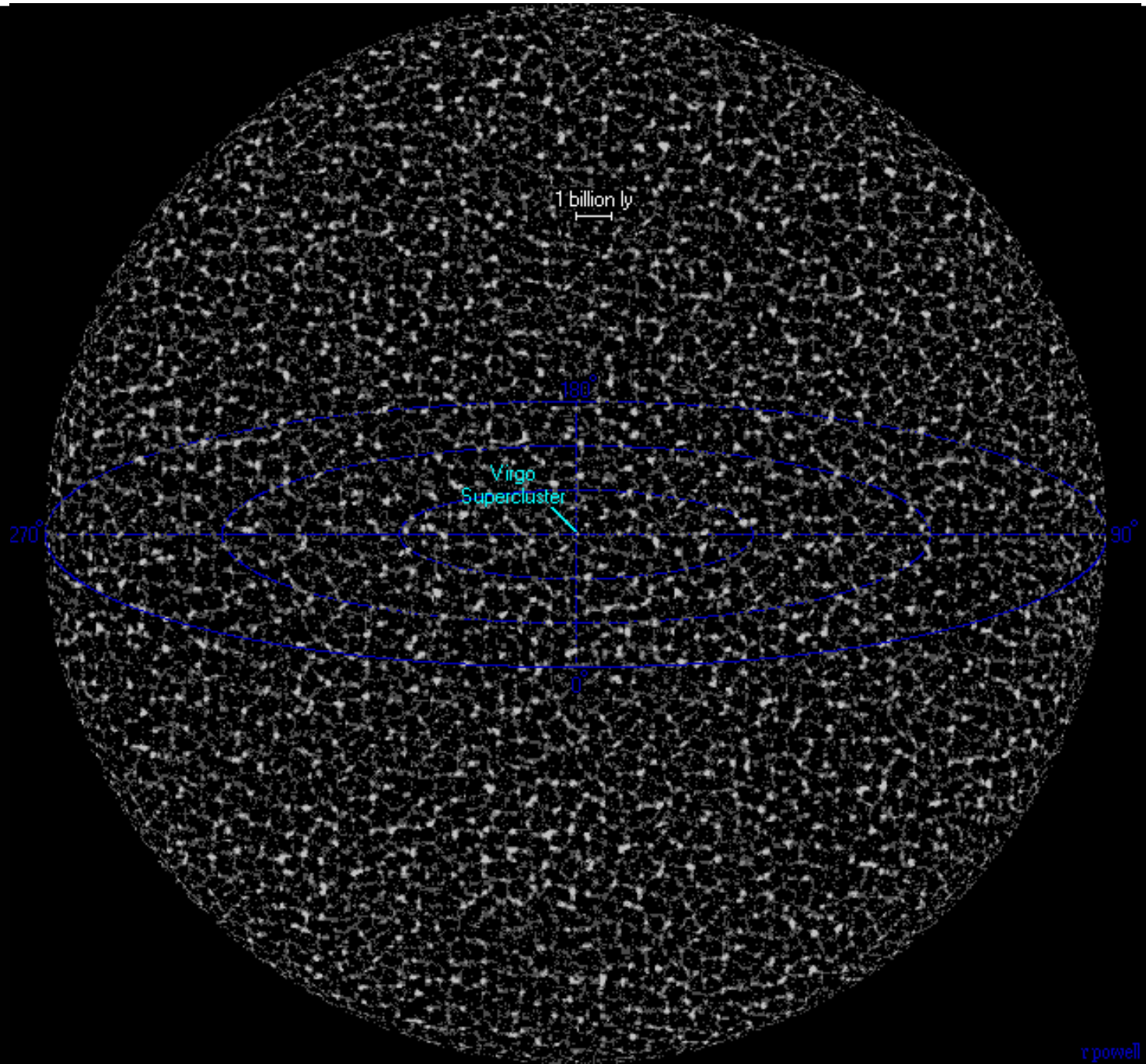
The Virgo Super Cluster



The Nearest Super Clusters

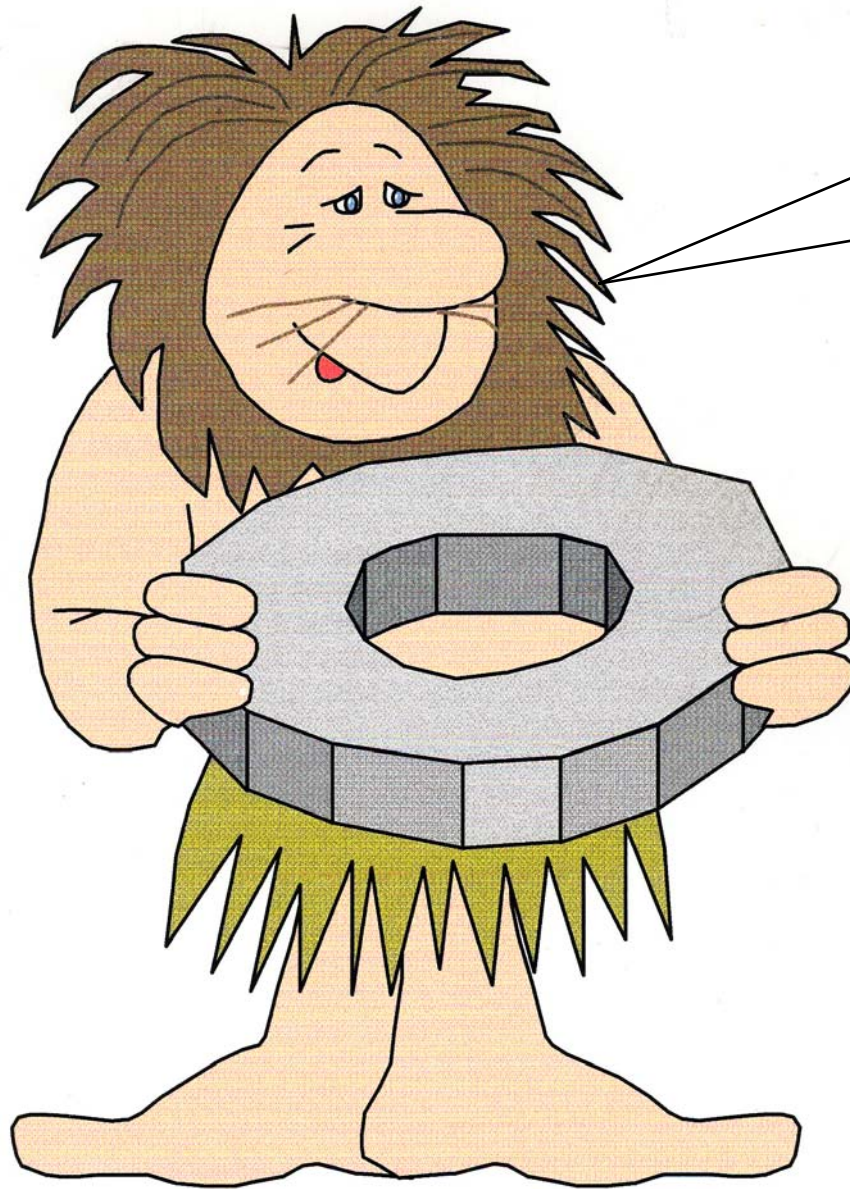


The Visible Universe



The Visible Universe





*That's all
Folks!*

The Top Ten Reasons why you need to be automating Configuration/Data Management

- # 6 All the other functions have already been automated.**
- # 7 Your “tech savvy” management is now aware that semiconductors are not part-time orchestra leaders and microchips are not very, very small snack foods.**
- # 8 Computers are unreliable, but people are even more unreliable.**
- # 9 Automation will provide a system that any fool can use, however, only the CM and DM fools will use it.**
- # 10 Under most rigorously controlled business environment, people will continue do as they damn well please.**



The Top Ten Reasons why you need to be automating Configuration/Data Management

- # 1 If you continue to do it manually, you will go blind.**
- # 2 If all you have is a hammer, everything looks like a nail.
If all you have is a computer, everything looks like magic.**
- # 3 Technology will provide you one more excuse as to why you can't get anything released.**
- # 4 Automation will provide a faster means to transform your statistics to meet the necessary performance criteria.**
- # 5 The only human institution resisting automation is the cemetery.**