

ATA 2005 eBusiness Forum

Spec 2000 Traceability Data Standards

Spec 2000 - An Industrial Standard for this Millennium

Jon Andresen

President

Technology Solutions

Oakland, CA

Garden Grove, CA

21 October 2005

© Technology Solutions 2005

Who Am I ?

~~The Bar Code Guy~~
~~RFID~~

Here to tell you: **forget the damn technology !**

(I'm really the Data Guy!)

Don't get sucked in by the technology !



**It's all about the data
and about**

ATA 2005 eBusiness Forum



ATA 2005 eBusiness Forum



Here's the Problem !

■ Ya gotta prove everything !

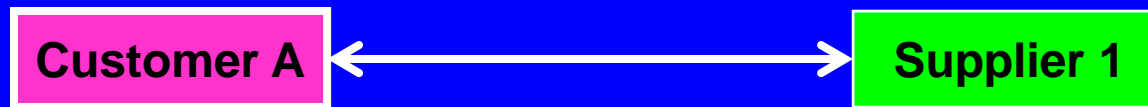
- Where did it come from?
- When did it come from there?
- Who brought it?
- Where is it going ?
- When will it get there ?
- Where is it now ?
- Who has it ?
- What condition is it in?

Safety
Critical

Security
Critical

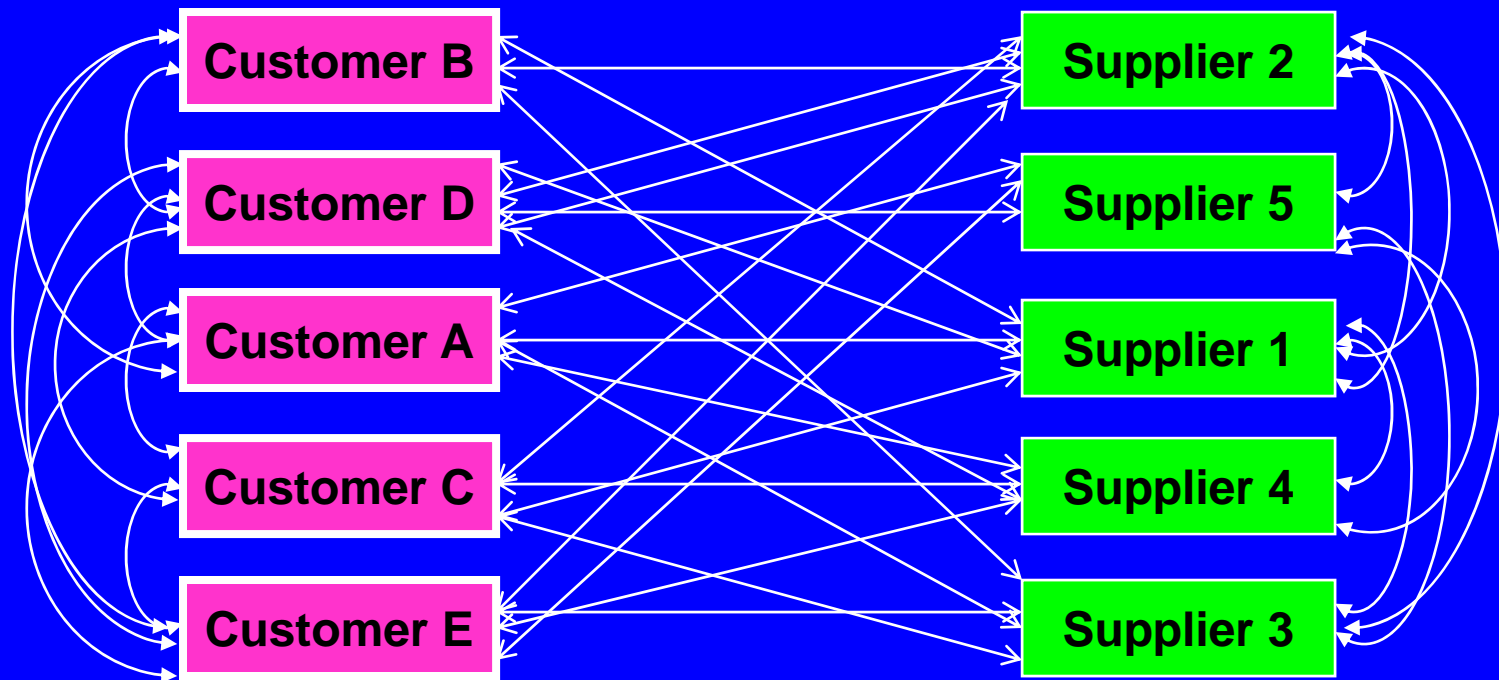
Cost
Critical

Why Spec 2000 ?



Is this your business model ?

...because of this !



It is too costly to do business 25 (or 2500) different ways !

Business Problems ?

■ **Common data**

- Whose Part # are we talking about? How long can it be?
Can it have special characters in it?

■ **Common identity**

- How does everyone uniquely identify this part? What is its Social Security Number that never changes?

■ **Minimum Standard for Traceability**

- When you do something to the part, what data do you record? What business benefit is gained by having data?

Problems Solved with Spec 2000

- Spec 2000 Data Dictionary defines all data
 - Definition, field lengths, special characters, etc.
- Spec 2000 ‘Social Security Number’ for parts
- Spec 2000 Traceability standard defines database
 - minimum standard with much flexibility

Spec 2000

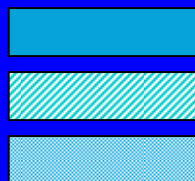
Functional and Data Architecture

The Foundation is laid with common data!
(giving parts a Social Security Number)

Permanent Bar Code/RFID Identification of Parts

Spec 2000 Common Data

Legend:



Existing Standards

'In-Process' Standards

Future Standards

Data

- **It is the strong foundation you want to build on**
- **It is persistent**
- **It guides corporations in all decisions**
- **It spans applications and ERP systems, and yes, even Vice Presidents!**

What's this ?

Part Number ?

Serial Number ?

263265930

Employee Number ?

Location ?

Order Number ?

Who knows ???

SSN without the dashes ?

This is a NAKED number with no intelligence whatsoever !

Example of an Intelligent Number

Serial Number showing the Text Element Identifier (TEI)



Simple, plain text, WYSIWYG, easy for people - easy for computers

Tracking Parts – Why so hard ?

Historically, real parts traceability is done poorly and is very expensive

- Most parts tracked by Serial # within Part #
 - ➡ it hasn't worked !
- Three logic flaws
 - » Customers invent their own numbering systems for parts
 - » When form / fit / function changes - new Part # required
 - this effectively loses the ability to track it
 - » No control between companies of Part Numbers assigned, no legal 'teeth' regarding bogus parts

**The business problem we're trying to solve is one of
(common) identification and traceability.**

Tracking Parts - the Solution

Spec 2000 Permanent Bar Code/RFID

What is it?

- A universal 'Social Security Number' for serialized parts
- Simple elegance - Only 2 rules:
 - 1) unique Serial # within CAGE Code
 - 2) RFID tag, label or mark lasts the life of the part

Easy to understand,

Easy to communicate

Who is using Perm. Part Marking?

- Used by 2000+ international companies
- An ISO 21849 specification
- Adopted by the AIA (Aerospace Industries Association)
- Included in DoD Unique Identifier (UID) policy
- It is adopted by the railroad industry
- It is used in some automotive companies
- It is used in numerous military programs
 - C17, CH47 Helicopter, torpedo marking, Joint Strike Fighter

Benefits of Spec 2000 Implementation

- **Every piece of data is intelligent**
 - the electronic data (quotes, orders, adv. shipping notice, etc.) and the bar coded data (shipping labels, perm. bar code ID) both use the same data identifier
- **Bar coded data and HRI allows for business transitions**
 - Human readable data allows for existing business systems to continue, and allows for more advanced companies to benefit from Auto ID savings.
- **Bar coded data and HRI allows for manual fail-over**
 - Human readable data is included with all bar codes to allow manual processes to continue when technology fails

Example of Spec 2000-Formatted Permanent ID Data Plate


“Current”
Part #

TCAS TRANSMITTER/RECEIVER
TYPE NO. TTR-920 WT 19.0 LB
FCC ID: AJK9URPN622-8971
FAA TSO C119e DOC/MDC 111 B193
COLLINS PNR 622-8971-320




DO-160B ENV CAT. DO-178A LEVEL 2
Collins Air Transport Division/Rockwell Collins, Inc.
Cedar Rapids, Iowa 52498-0001 USA

Permanent
Identifier
(= SSN)



MFR 4V792



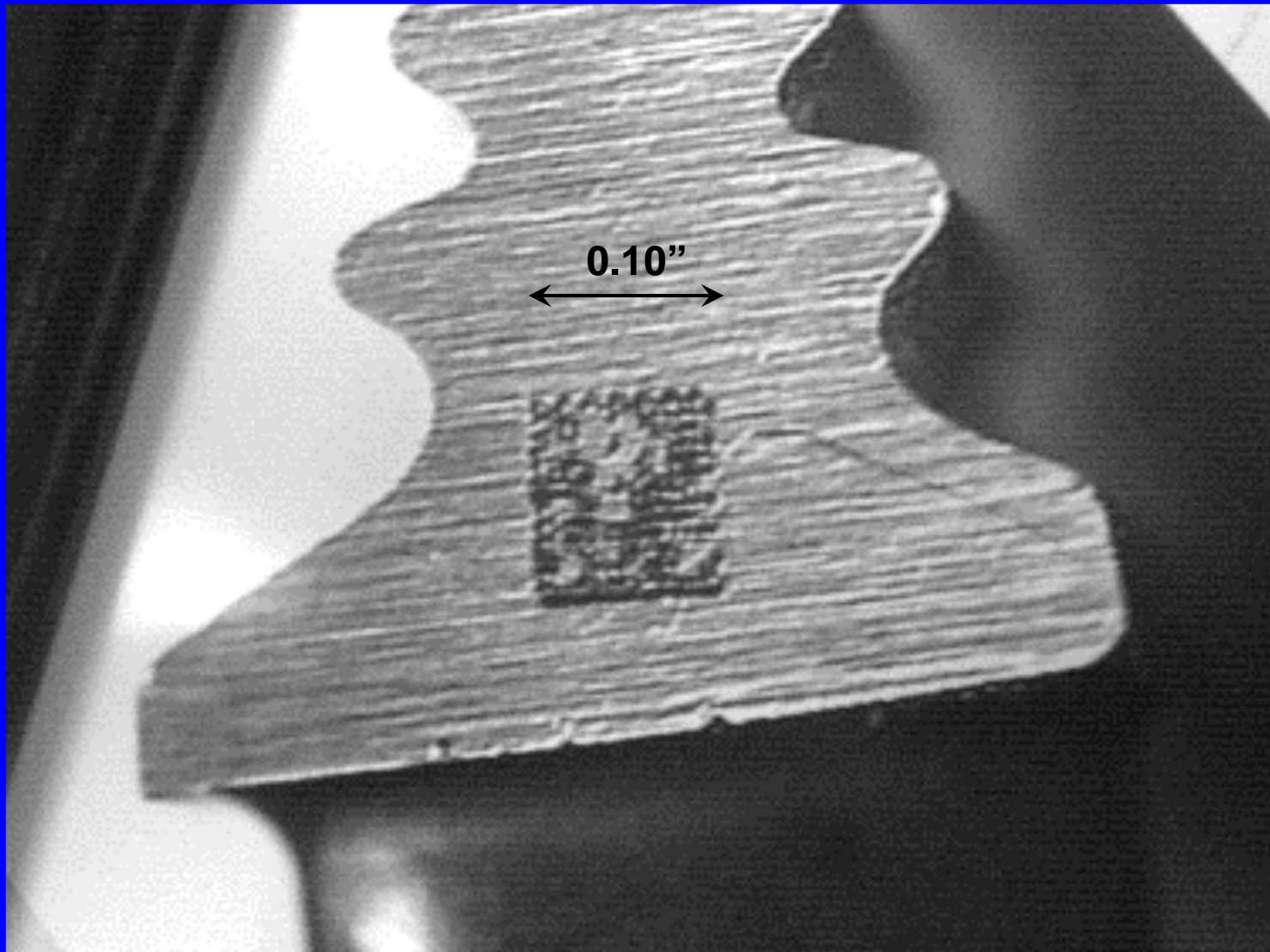
SER 6283 MFR DATE 9810

MODS	1	X	X	X	X	6	7	X	X	10	11	12	13	14		
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
	31	32	33	34	35	36	37	38	39	40	A	B	C	X	E	F

RFID chip



2D SSN on a turbine blade



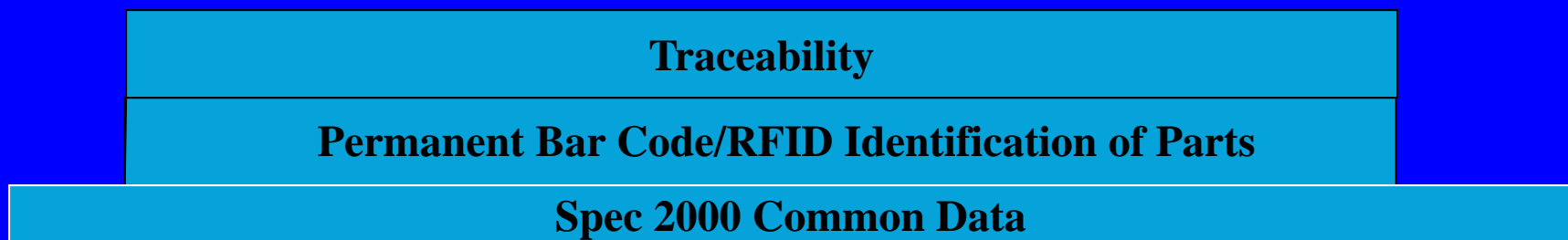
So We've Marked our Parts

- Using common data
- With a common identity format

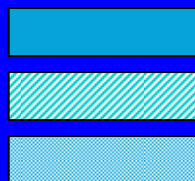
Let's Get to Traceability!

Spec 2000 Functional and Data Architecture

Business Functionality begins to appear
with Traceability standard



Legend:



Existing Standards

'In-Process' Standards

Future Standards

What is Traceability ?

- The ability to show where a part has been since it was manufactured/last certified.

How do you get it ?

- By sharing data with others – Customers, Suppliers, distributors, repair agencies, and, yes, even Competitors!

Spec 2000 Traceability Standard

- International Spec2000 Coordinating Group approval in October 2003
- The first Traceability standard in the world to cover repairable and rotatable parts
- Provides a data standard and an industry standard for cradle-to-grave tracking of parts

Example: Data record for OVH

Minimum Traceability Standard

Action Code

Data You Want

Social Security #

CAGE Code	Unique Serial #	Current Part #	Action Date	Action Company	Action Code	Cond. Code	New Limits (Conditional)	Original Serial #	Your Part #	Other Data
61G49	1234567	P7DTR26	20020420	81979	OVH	SRV	1000 cycles	1234567	P7DTR26	
61G49	6757	P7DTR26	20020420	81979	OVH	SRV				
61G49	92DS3	P7DTR26	20020420	81979	OVH	SRV	600 hours			

OVH - Overhauled

The six common required data elements are sufficient for the minimum of who, what, when, where. The Overhaul Action Code requires a reporting of whether the part is currently serviceable and what the new limits are.

Traceability Requirements

Common Required Data Elements in All Processes

1. CAGE Code of the Manufacturer (MFR) or Supplier (SPL)
2. Part Serial Number (SER) or Unique Component No. (UCN)
3. Current Part Number (PNR)
4. Action company's CAGE Code (ACO)
5. Action Date (ACD)
6. Action Code (ACT) – see approved codes

Traceability Requirements

Approved Industry Action Codes are:

- MRK – marked unit
- MFG – manufactured
- SHP – shipped to
- INS – installed on/in
- RMV – removed from
- RPR – repaired
- OVH – overhauled
- EXC – exchanged with
- SLD – sold to
- BUY – bought from
- SCP – scrapped
- WHR – warehoused
- OTH – other
- RCD – received from
- UPG – upgraded to new Part #
- INP – inspected / tested

These are the events in a part's life that should be tracked

TRACEABILITY Database Example

Min. Traceability Standard

Your Information (optional)

"Social Security Number"

CAGE Code	Serial Number	Current Part #	Action	Action Date	Action company	OEM	Original Serial #	Aircraft Number	Condition Code	Internal Location	Etc ...
61G49	1234567	P7DTR26	RMV	23/11/99	83PH4	Collins	T52D611	UA3482	UNS	Shop 141	
91673	83H6290	459873L8	INS	23/11/99	83PH4	Collins	83H6290	UA3482	SRV	UA3482	
91673	SS12932	9J9846	SCP	24/11/99	83PH4	Honeywell	H12933		UNS		
1283S	836	LPY67FF	INS	29/11/99	83PH4	Lucas		UA5534	SRV	UA5534	
91673	9943	28374-22	OVH	30/11/99	83PH4	Boeing			SRV	Shop 180	
83845	489GD5	938475-1	SLD	01/12/9	83PH4	P&W	489GD5		SRV	Delta	
83845	MR32121 - 143	P9475-503	OVH	5/8/00	83PH4	Lucas	75463	UA2234	SRV	StkRm C	
81979	TS1-5221	7109783H	MRK	6/29/00	81979	EIA	591783	UA1731	UNS	Shop 142	

Action Codes:

MFG - manufactured
 MRK - marked (initialized) unit
 SHP - shipped
 INS - installed
 RMV - removed
 RPR - repaired
 OVH - overhauled
 EXC - exchanged
 SLD - sold
 SCP - scrapped
 WHR - warehoused

Condition Codes:

SRV - Serviceable
 UNS - Unserviceable

Spec 2000

Functional and Data Architecture

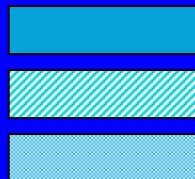
The Foundation is laid!
(giving parts a Social Security Number)

2000 companies - where is yours?

Permanent Bar Code/RFID Identification of Parts

Spec 2000 Common Data

Legend:



Existing Standards

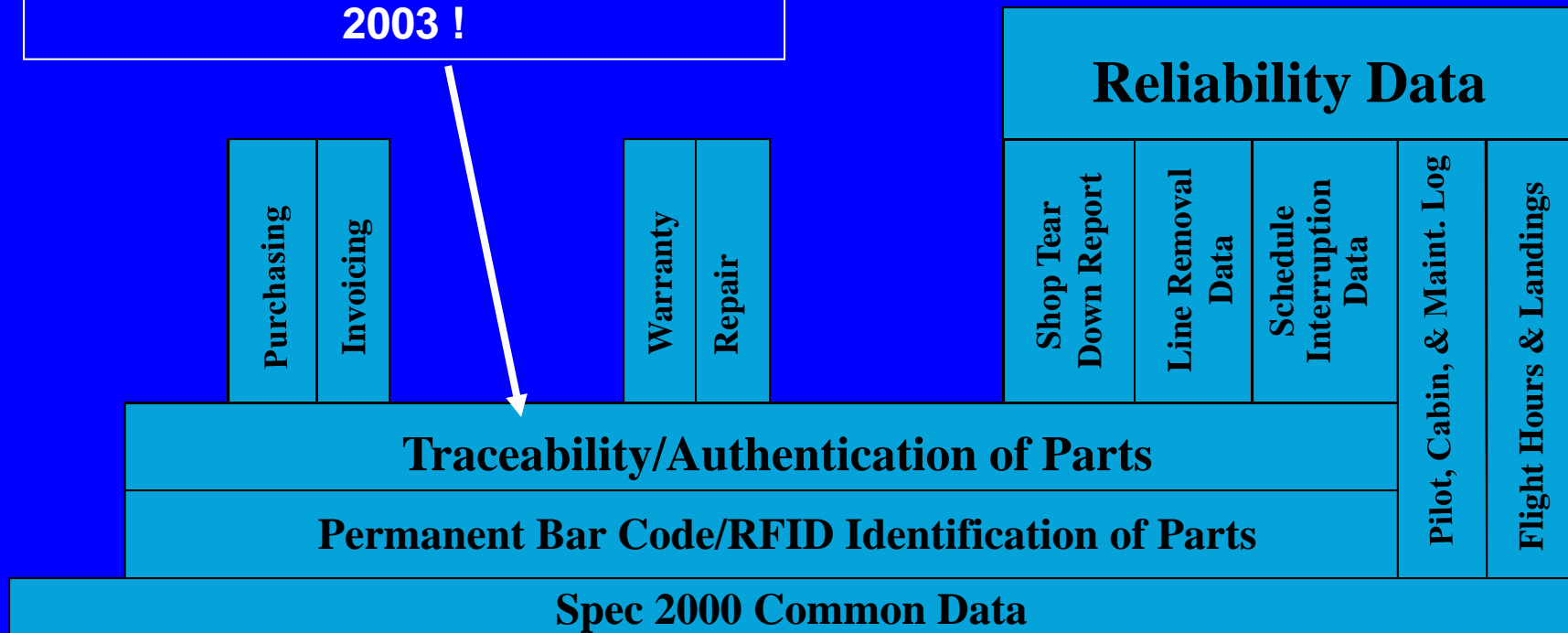
'In-Process' Standards

Future Standards

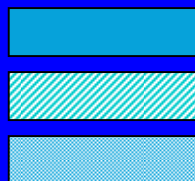
Spec 2000

Functional and Data Architecture

This important piece added in 2003 !



Legend:



Existing Standards

'In-Process' Standards

Future Standards

Spec 2000 Configuration Management Group

Functional and Data Architecture

Advanced Forecasting & Planning										Maintenance Cost Analysis						
Inventory Control										Reliability Data						
Configuration Model	Composition Control & Serial Number Tracking	Purchasing	Invoicing	Scrap Parts	Unapproved Parts	Electronic Documentation	Warranty	Repair	Exchange Parts	Loan/Borrow	Cost-to-Repair	Shop Tear Down Report	Line Removal Data	Schedule Interruption Data	Pilot, Cabin, & Maint. Log	Flight Hours & Landings
	Traceability/Authentication of Parts															
	Permanent Bar Code/RFID Identification of Parts															
Spec 2000 Common Data																

Legend:

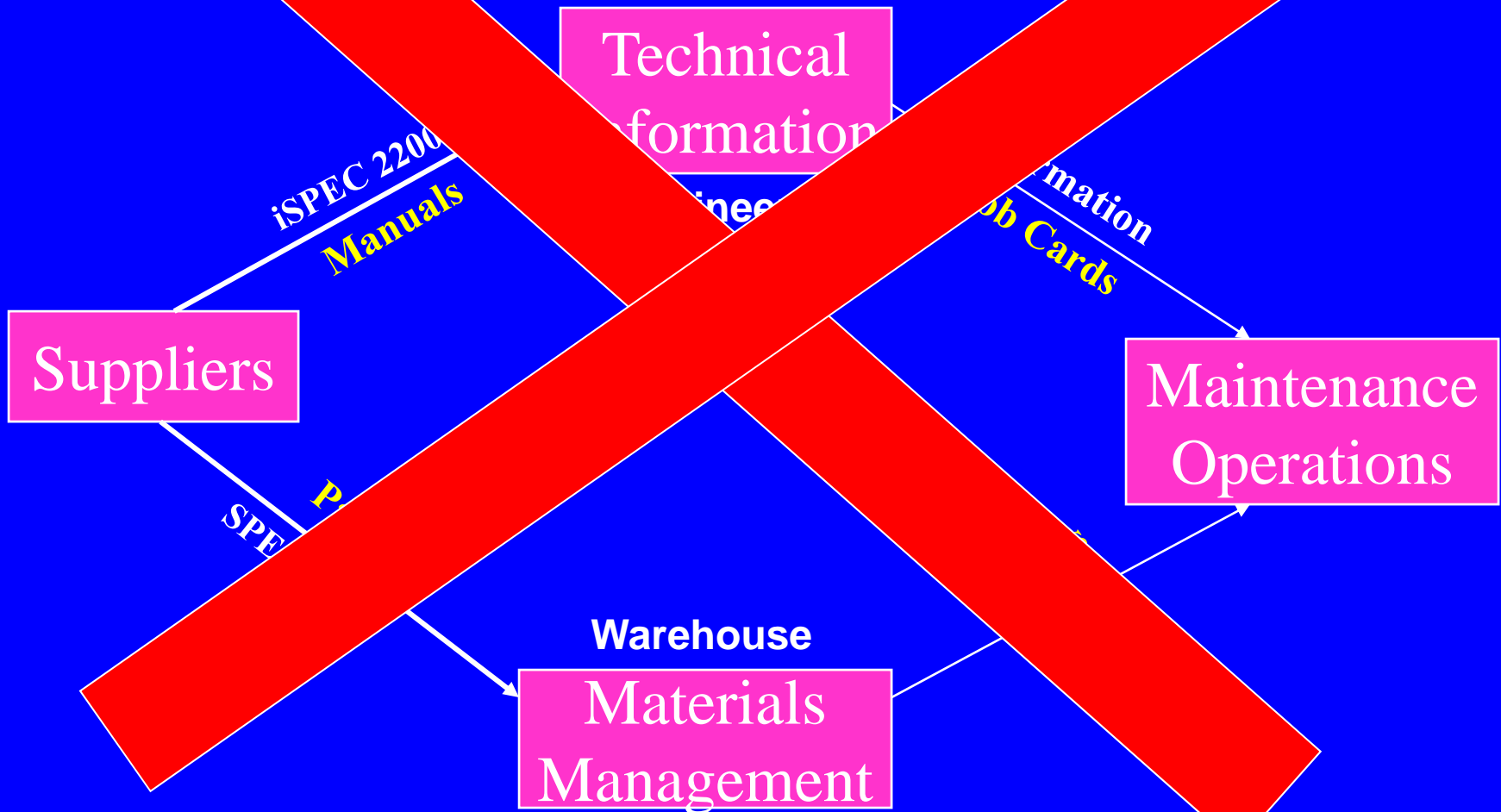


Existing Standards

'In-Process' Standards

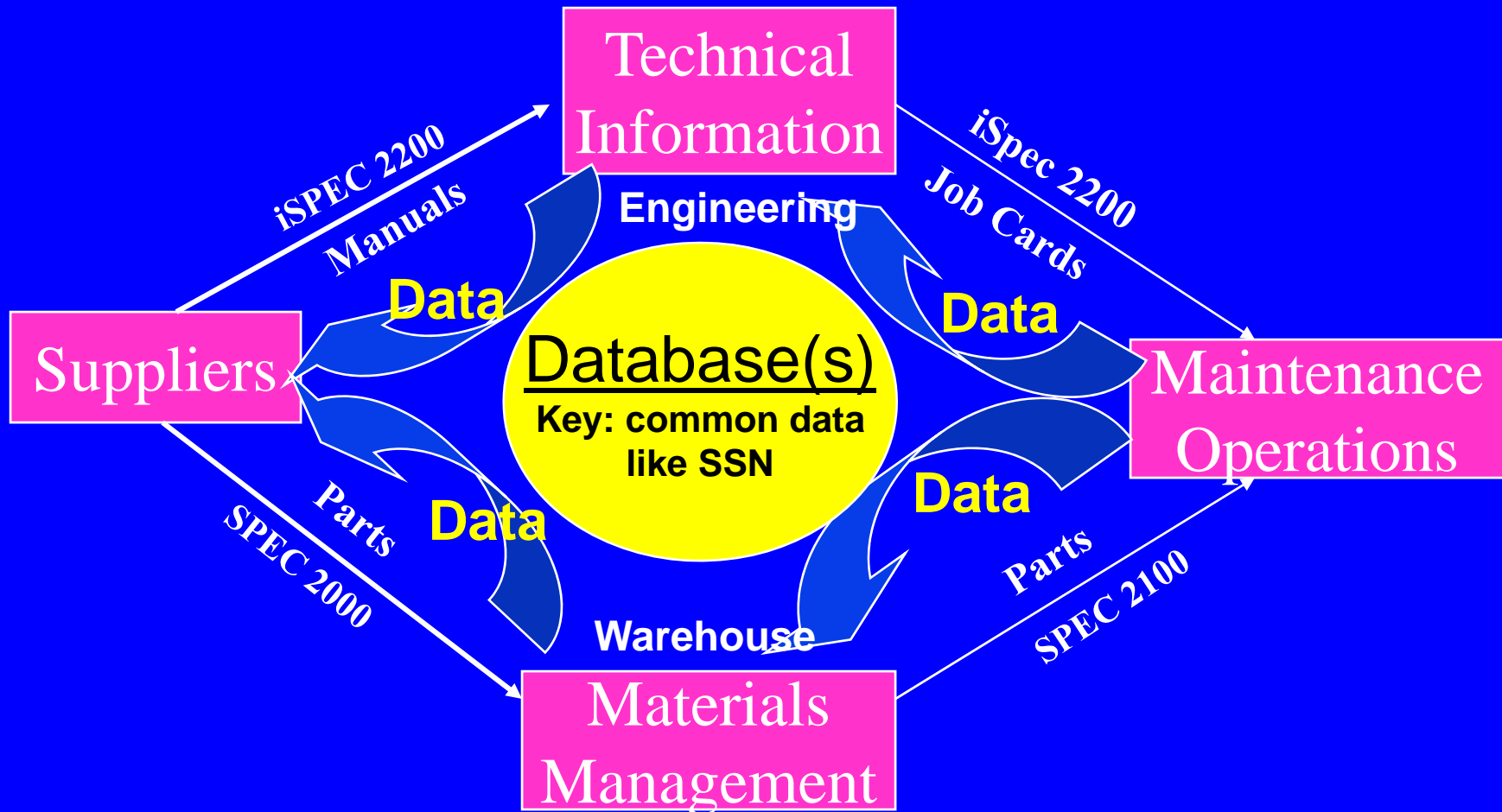
Future Standards

Old Way of Doing Business

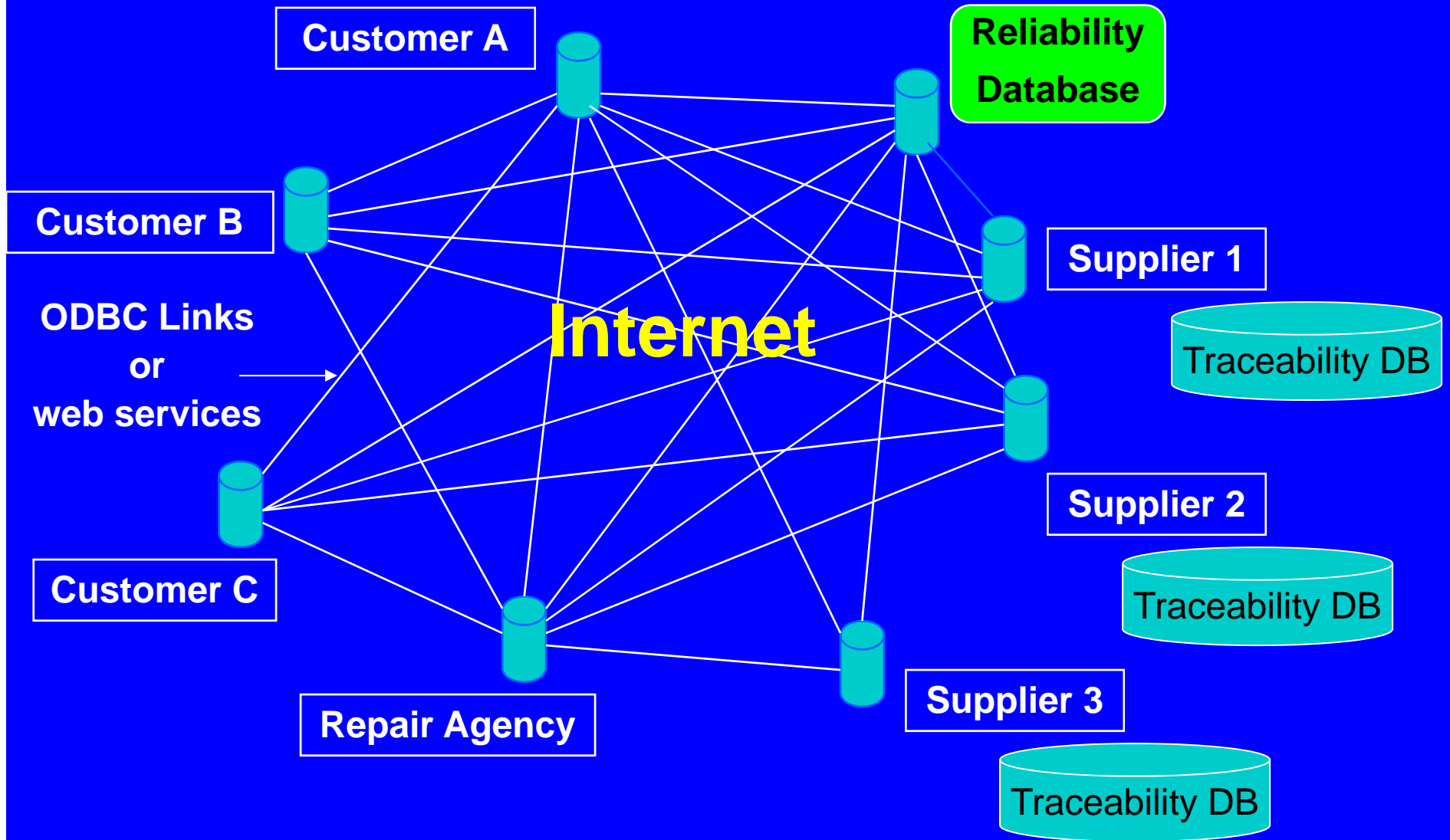


This is a monologue – not a dialogue !

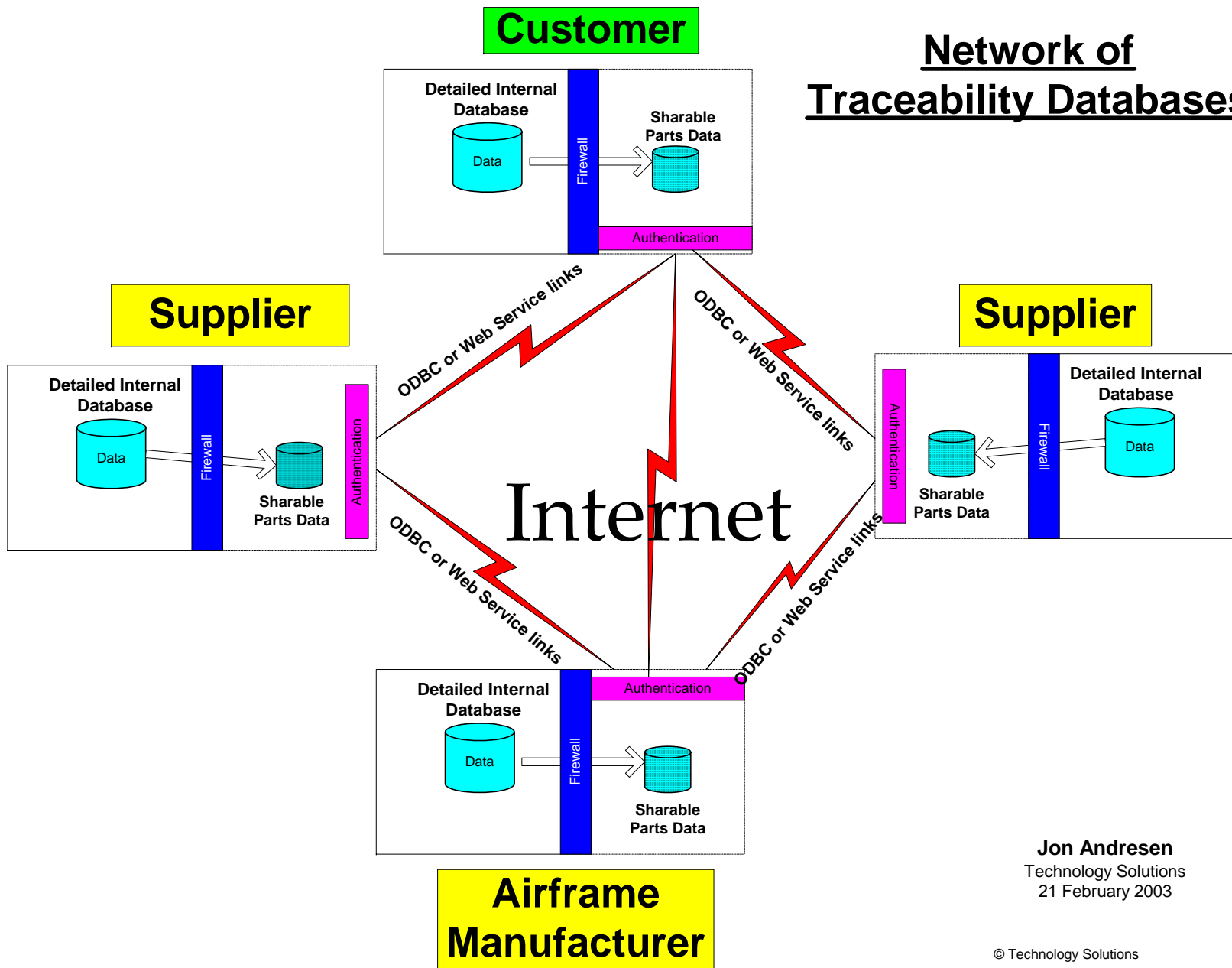
Spec 2000 Approach to Collaboration



The Near Term Future – Commercial World

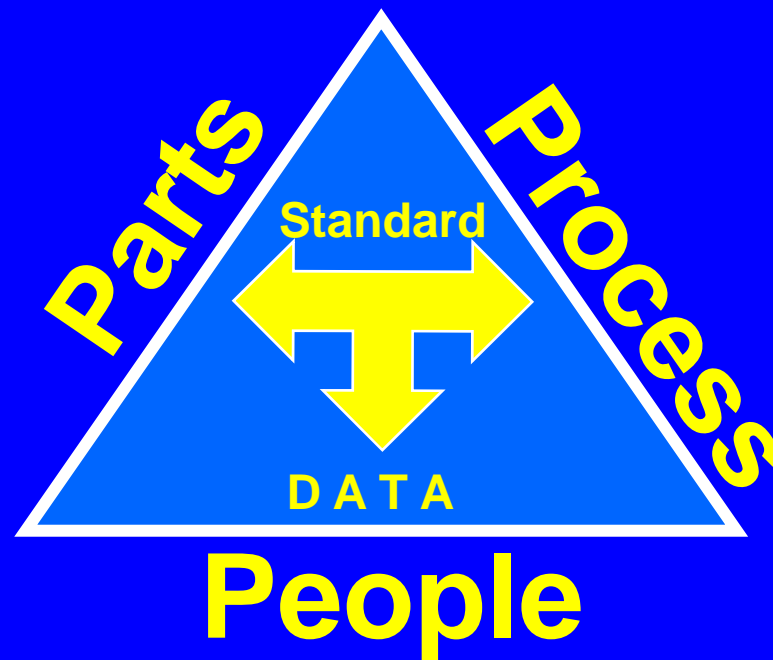


Network of Traceability Databases



Jon Andresen
Technology Solutions
21 February 2003

**Part ID and Tracking is Complex in our business...
but it all revolves around Standard Data**



Standard data is the only True North

– not your policies, not ERP systems – Data !

Spec 2000 delivers standard, collaboration-quality data !

ATA 2005 eBusiness Forum

Thank You

for your attention !

For more information on Spec 2000 Permanent Bar Code ID:

www.spec2000.com

Or contact:

Jon Andresen

President, Technology Solutions

5069 Dublin Ave.

Oakland, CA 94602-2604

(510) 531-2201

Email: Jon@TechSoln.com

© Technology Solutions 2005

