

A New World of DMSMS

DMSMS '06

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Dr.Carolynn A. Amberntson

Sr. Staff Procurement Engineer

Lockheed Martin Missiles & Fire Control

LOCKHEED MARTIN 
We never forget who we're working for™





LOCKHEED MARTIN
\$37.2B 2005 Sales
135,000 Employees



Focused on Customer Satisfaction and Shareholder Value

Electronic Systems Business



- **30,000 Employees**
- **5 Principal Businesses Organized Into 3 Major Business Units**
- **18 Primary Locations**
 - In 14 U.S. States, Canada, U.K.
- **1,000+ Programs**
- **Customers Include:**
 - U.S. DoD
 - International
 - Civil Agencies

Maritime Systems
& Sensors



Missiles and
Fire Control



Platform, Training
& Transportation
Solutions

Balanced Weapon Systems and Information-Driven Businesses

Missiles & Fire Control Business



- >70 Products
- 1,000+ Active Contracts
- Approximately 2,000 Proposals
- Pursuing Business in 50 Countries
- World Class Mission Success

2005 Sales
Approximately \$3.7B

Major Products



Missiles and Fire Control

Tactical Missiles	Strike Weapons/ Archbald	Air & Missile Defense	Fire Control	Applied Research	
M270/M270A1 HIMARS® MLRS® Rockets GMLRS™ ATACMS® NLOS-LS MULE™ UGCV Survivability	Hellfire® Longbow™ JCM™ CKEM Javelin™ SRAW-MPV (UAW) AGS/LRLAP™	JASSM™ JASSM™ -ER WCMD™ WCMD™-ER LongShot™ SDB™ II Paveway II	PAC-3™ / MSE Missile THAAD™ MEADS Objective Launchers Objective BMC4I PAC-2 Missile Chaparral™ LEAPP MKV	Arrowhead® TADS/PNVS™ Longbow™ FCR FCS R&S Mast FCS Auto Tgt Recog F/A-22 MLD LAIRCM™ Sniper® LANTIRN™ ER NITE Hawk™ JSF™ EOTS Target Sight System ATIC Gunship Multi-Sensor	Rehearsal & Simulation Directed Energy - HPM - Laser - EM Special Programs Space Systems Advanced Research & Technology

MFC Locations



MFC DMS Perspective



- MFC is heavily reliant upon electronic and optical components and assemblies for its products
- MFC has been a pioneer in DMSMS strategy
 - Developed procedures, proactive strategies and cross-functional teams
 - Cross Functional Procedures for Component Selection
 - Standardization of Components based on roadmaps
 - Flowed to become an integral part of doing business across MFC and our supply chain
 - Enjoys an industry-leading success rate for low-cost solutions that do not impact product build and/or delivery schedules

DMSMS Influences



- DMSMS has been traditionally defined by DMEA as:
“...the loss or impending loss of manufacturers or suppliers of critical items and raw materials due to discontinuance of production, leaving the device unprocurable “.
- Typically think of DMS as business-model related due to uneconomical production
 - More challenging due to PBL contracts, product warranties and extended platform service life
- Creates the generally well understood “Trailing Edge” DMS model

Trailing
Edge
Technology

DMSMS Influences



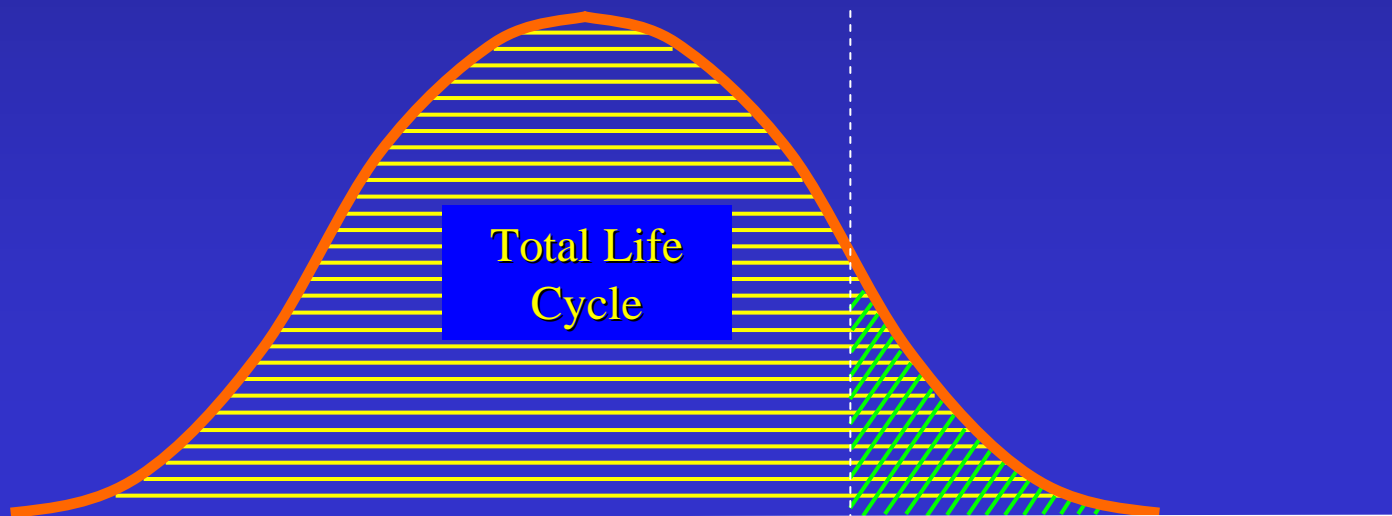
- Traditional tool sets:
 - GIDEP, PCNs, Life Cycle tools
 - Supplier roadmaps, data mining and communication
 - Industry forums
- Traditional solution options:
 - Leverage
 - Alternate sources or parts
 - Commercial Technology Insertion
 - Aftermarket
 - Brokers
 - Repackaging
 - Emulation/Reverse engineering
 - LTB
 - Redesign

Trailing
Edge
Technology

DMSMS Influences



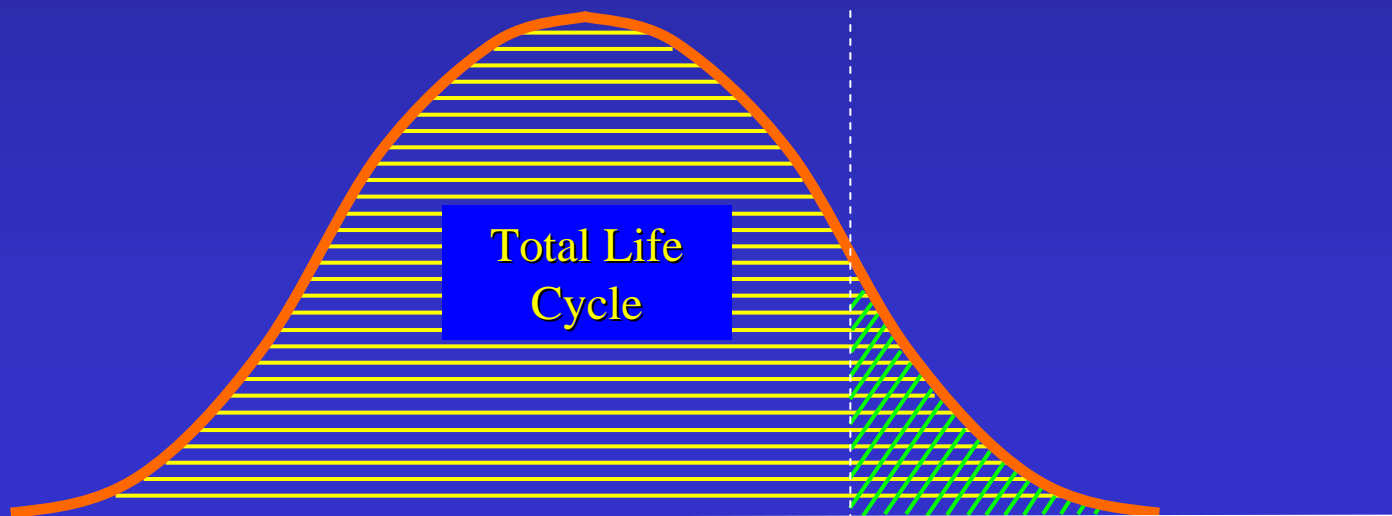
- Non-traditional factors are now contributing
 - More difficult to deal with because you cannot plan for them
 - RoHS, Specialty Metals
- Creates the “Total Life Cycle” DMS model



DMSMS Influences



- Tool sets:
 - GIDEP
 - Data mining and communication
 - Industry forums
- “Solution” options:
 - Leverage
 - Alternate sources or parts
 - Redesign
 - Lobbying
 - Withholds



DMSMS Influences



- New twist on DMSMS issue emerging in high technology fields such as Optics
- Reliance of military systems on optical technology for enhanced performance is increasing
- Current optical materials and shapes cannot meet performance requirements for the next-generation systems
- National Research Council (NRC) report *Harnessing Light: Optical Science and Engineering for the 21st Century*
 - “... the military viability of new optical system technologies depend upon further improving optical system performance and cost, which in turn requires critical breakthroughs in optics manufacturing capabilities.”

DMSMS Influences

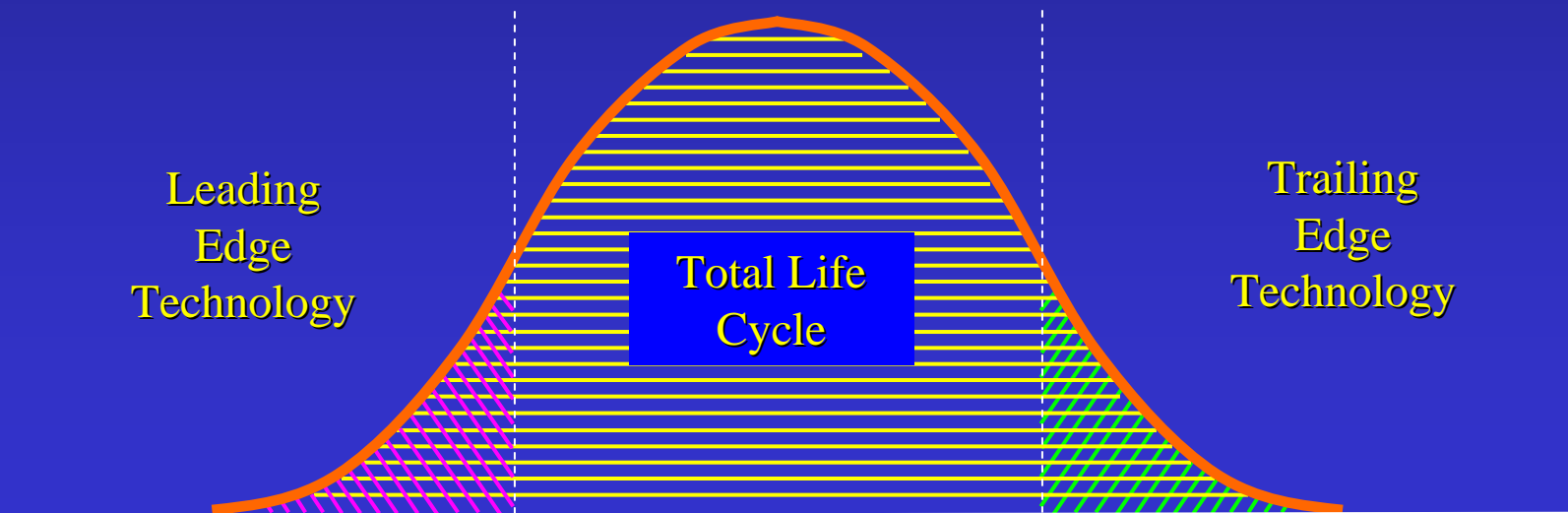


- Performance Requirement Challenges
 - Fabrication accuracies orders of magnitude beyond metal machining
 - Materials very hard and brittle
 - Unusual shapes
- MFC Observations:
 - Tighter packaging constraints
 - More aspheric surfaces
 - Larger diameter components
 - Use of a larger percentage of optical surface
 - More complex coating requirements
 - New materials
- Beyond current capabilities of supply chain
- Negative effects on quality, schedule and cost targets

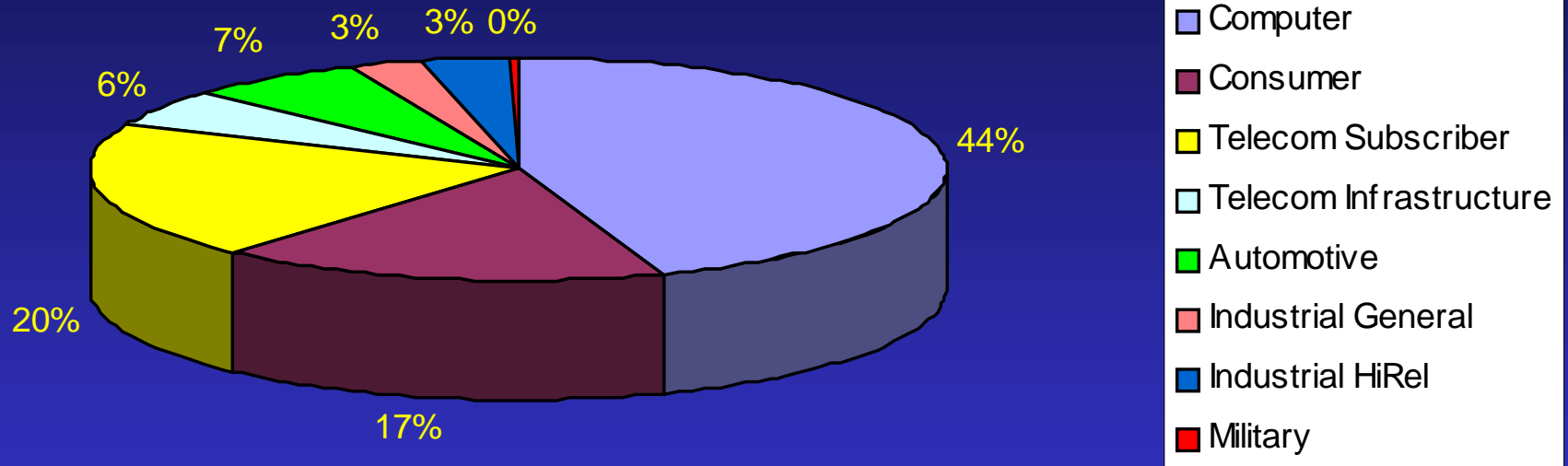
DMSMS Influences



- Has created “Leading Edge” Technology DMS model
- Double-Edged Sword: As technology advances to meet leading edge requirements, additional DMSMS losses incurred on the trailing edge



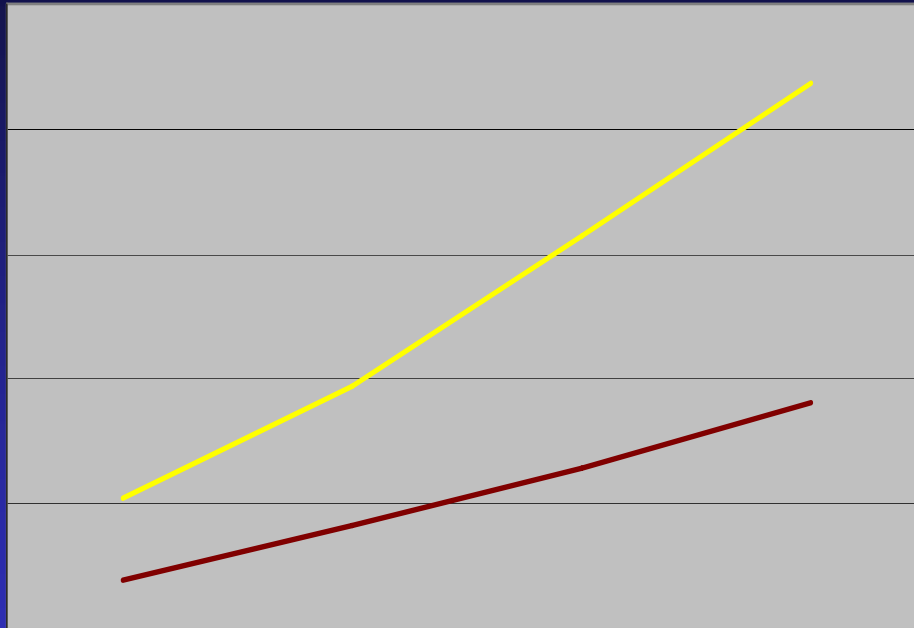
Worldwide Semiconductor Market *



* Courtesy of Rochester Electronics

- Military market continues to be an insignificant factor
- Must continue to seek innovative solutions to a dwindling supply base

Worldwide EO Forecast *



-  Commercial & Dual-Use
-  Military

- Majority of dollars remain in military IR systems
- Market erosion by commercial applications
 - Growth rate ~20%
- Optical components comprise larger percentage of commercial system cost
- Military growth not as significant: <10%; led by Airborne applications
 - Requires capture or take-away plan

* Maxtech International, Inc.

DMSMS Effects



- Shrinking supply base
 - Unique capabilities required
 - Dependence on labor-intensive equipment and special skills
 - Dramatic globalization-US base has lost the lead in some key areas
 - Increased opportunities in commercial applications
 - Significant consolidation/partnering activity
 - Vertical integration by Prime Contractors
- To counter these challenges we must...
 - Understand the capabilities of our supply chain
 - Form true “strategic partnerships”

DMS & Strategic Sourcing



- OEMS must engage in strategic sourcing activities to mitigate against all life-cycle DMSMS models
 - Started in 1980s by General Motors
 - MFC, like many other OEMs, purchases a significant percentage of products via its supply chain
 - Allows formation of close alliances with supply base to better understand capabilities and technology roadmaps
 - Benefits
 - Minimize costs while reducing risks
 - Improving performance
 - Strong relationships with “best value” supply chain partners
 - Consolidated purchasing power
 - Issues: Suppliers are leery of strategic sourcing initiatives
 - Aerospace industry has been challenged regarding misapplication of strategic sourcing tenets*

* Rossetti, C & Choi, T. (2005). “On the Dark Side of Strategic Sourcing: Experiences from the Aerospace Industry,” *Academy of Management Executive*, 2005, 19(1).

DMS & Strategic Sourcing Implementation



- Strategic sourcing process
 - Assess current supply base purchases
 - Evaluate supply base capabilities
 - Establish optimized supply base
 - Identification of suitable suppliers
 - Implementation of new supply structure
 - Metrics and maintenance

Supplier Manufacturing Capabilities - Introduction



- **Goals:**

- **To optimize the MFC supply base**

- **Identify and validate supplier capabilities**
 - **Establish strategic sources**

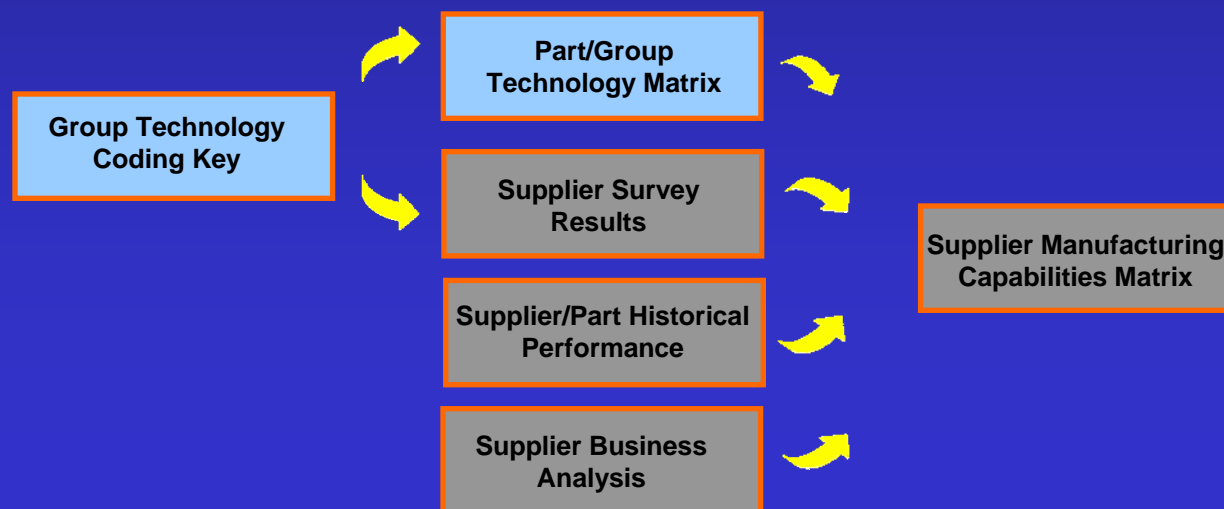
- **Benefits:**

- **Provide engineering community with the manufacturing capabilities of the MFC supply base during the design process (design-to-capabilities)**
 - **Provide buyer community and supplier selection community with a tool to assess supplier capabilities and performance to those capabilities during the selection process**

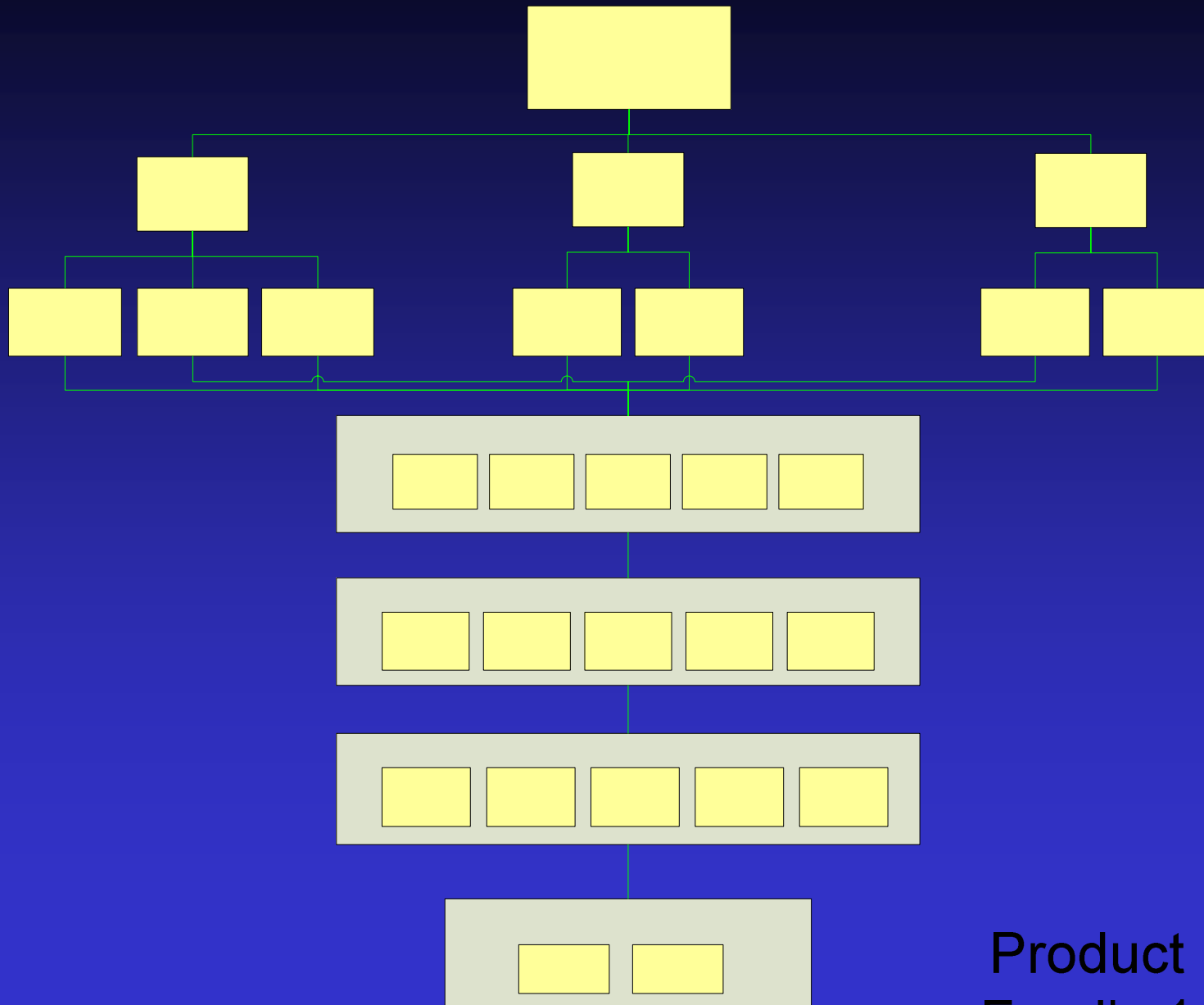
Supplier Manufacturing Capabilities – GT Code



- To effectively compare the supply base, we must establish key characteristics that classify ‘like’ products
- Key characteristics must be based on manufacturing discriminators
- Developed Group Technology coding scheme
 - Uniquely identifies product sets in terms of a hierarchy of manufacturing discriminators
 - Code used to categorize MFC Optics part numbers



Group Technology Coding - Notional

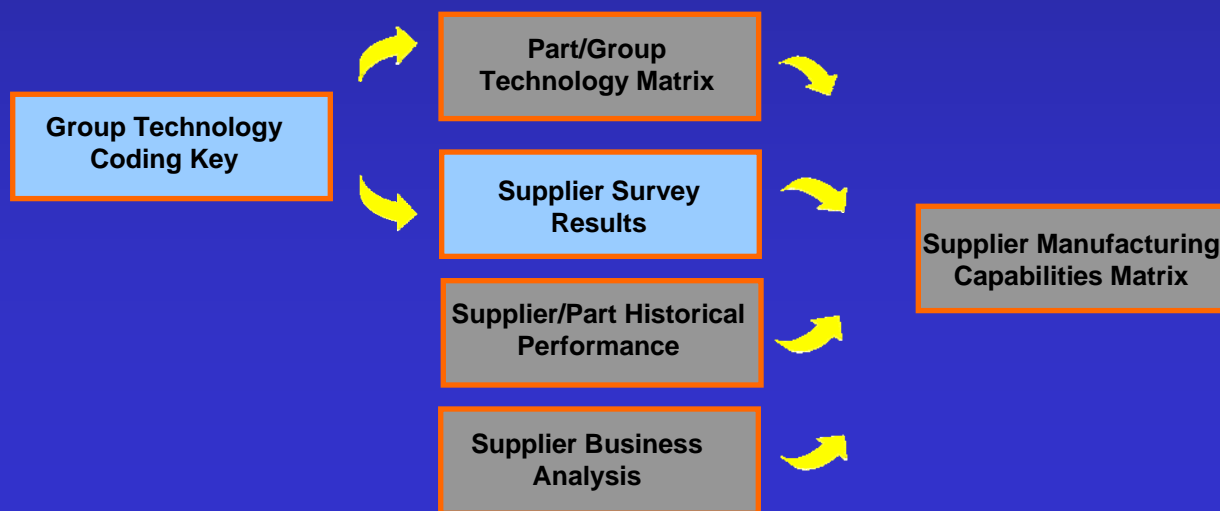


Product
Family 1

Supplier Manufacturing Capabilities - Survey



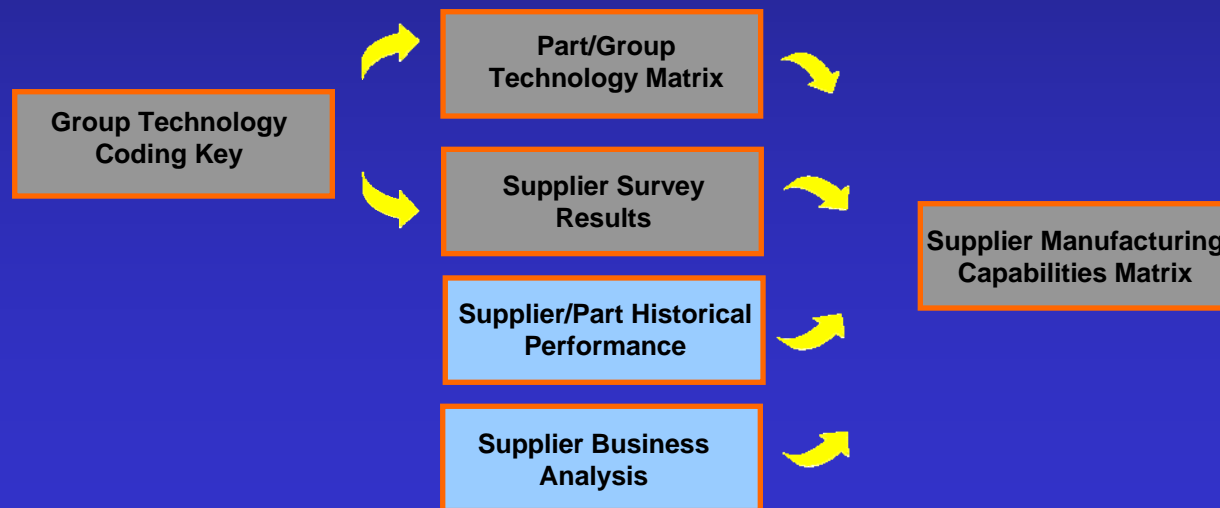
- Determine supplier capabilities
- Phase I survey developed and distributed
 - Questions focused on establishing capabilities of suppliers relative to Group Technology Code components
 - Focused on 4 primary product groups
- Demographics & Commodity sections
- Business structure & Hierarchical product capabilities



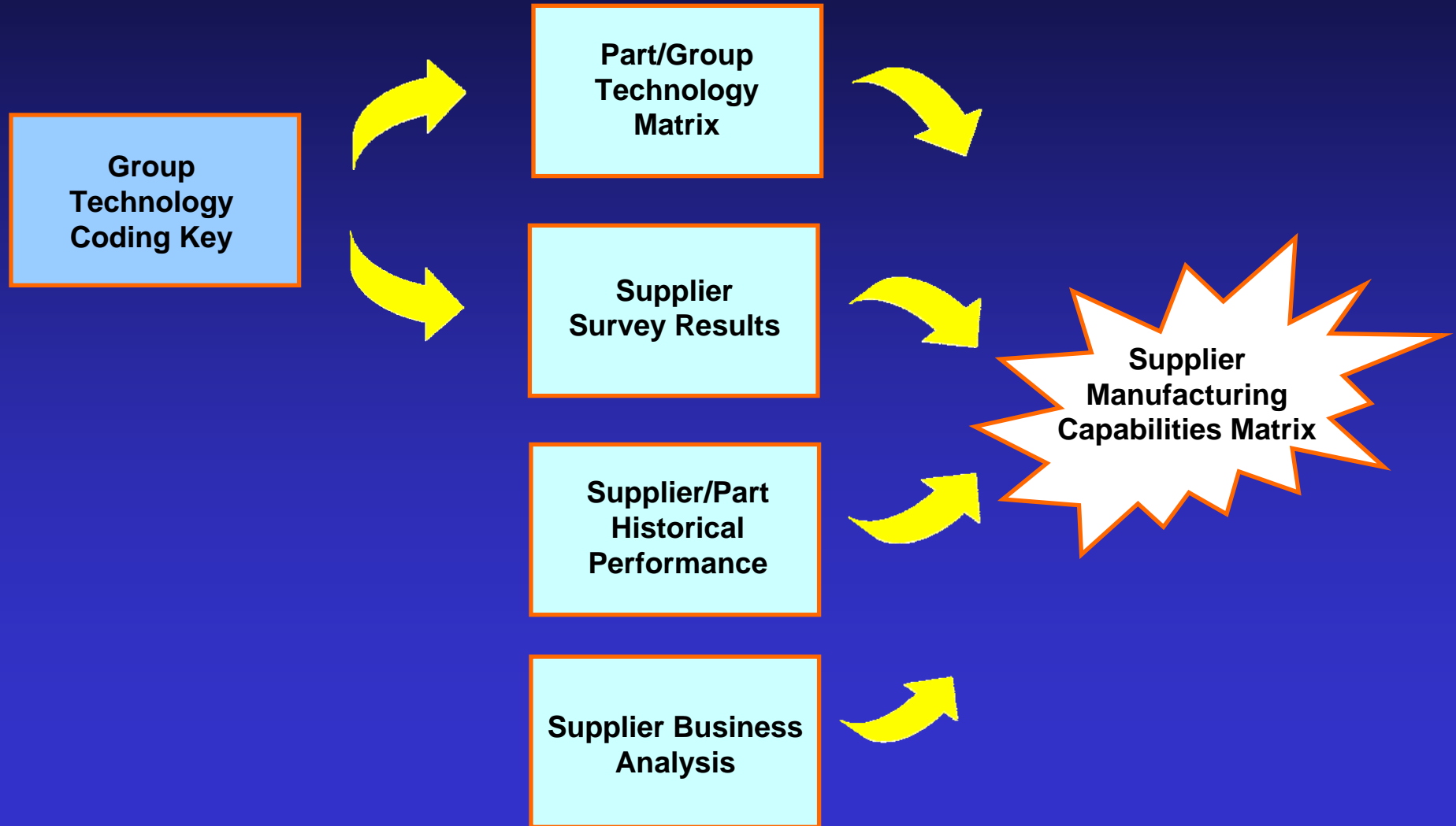
Supplier Manufacturing Capabilities - Validation



- Validated via historical performance on GT Coded products
- Validation of products with no performance history achieved via survey responses and verification



Data Elements



Supplier Manufacturing Capabilities Matrix



- **Supplier Manufacturing Capabilities Matrix**
 - **Highlights opportunities for resourcing due to poor performance or DMS (Trailing Edge DMS)**
 - **Identifies supply base to meet product requirements during the design phase (Leading Edge DMS)**
 - **Identifies if supplier development is required**
 - **Provides opportunities for supplier engagement**
 - **Allows review of supply base and performance against any characteristic in the GT Code**

Supplier Manufacturing Capabilities

GT Code Assignment/Performance/Capabilities/Company Information



PIIGTCode

Search for a Record Didn't Find Record? Click Here to Add

Click on GT Code for Supplier Performance

Capable Suppliers Search

GT Code Components

Part Number	Part Description	GT Code	Commodity	GT Code Components							
Part No. 1	Lens, No.2	111199110	11	11			1	1	0		755
Part No. 2	Lens Element, Relay-No. 1 and 9	111124220	11	11	24		2	2	0	.25	
Part No. 3	Lens Element-Relay No. 3 and 7	111124120	11	11	24		1	2	0	.25	600
Part No. 4	Lens Element, Relay-No. 4 and 6	111124120	11	11	24		1	2	0	.25	

Record: 1 of 567

Supplier GT Code Performance

GT Code Capable Suppliers

SupplierGTCPerform

Filter Options: Program Product

Quality and Delivery Part Number Performance History

Supplier	Part Number	Description	Program	Product	Performance History (2004-2006)												Req Rec
Supplier 1	Part 1	Lens Element, Dcu	Program A	Product	[Performance Data Grid]												5
Supplier 2	Part 2	Lens Element, Dcu	Program B	Product	[Performance Data Grid]												1

Record: 1 of 7 (Filtered)

Supplier List

Supplier Name	DUNS	Product Capability Level	Capability Level
Supplier 1	000000001	4	4
Supplier 2	000000002	4	4
Supplier 3	000000003	4	4
Supplier 4	000000004	4	4
Supplier 5	000000005	4	4
Supplier 6	000000006	4	4
Supplier 7	000000007	3	3
Supplier 8	000000008	4	4
Supplier 9	000000009	3	4
Supplier 10	000000010	4	4
Supplier 11	000000011	4	4

Record: 1 of 56

Closing Remarks



- **As the military supply base continues to dwindle is in inherent upon the OEMs to...**
 - **Understand the supply base**
 - **Identify strategic suppliers**
 - **Engage in and maintain strategic sourcing relationships**
- **Only by teaming can we combat the effects of DMSMS and continue to support warfighter readiness**

