

Director of Defense Information

Department of Defense and Information Technologies:
Declining Budgets, Increased Expectations

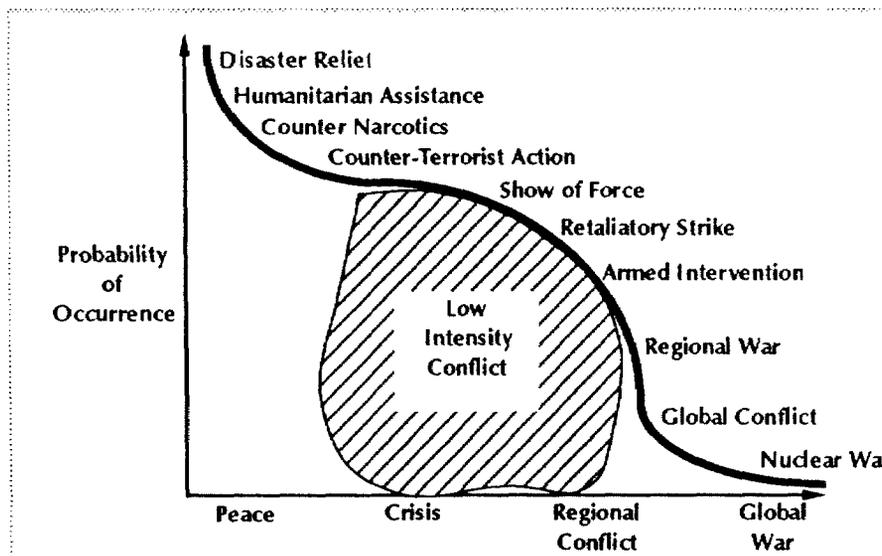
CIO Conference
Boca Raton, Florida, October 13, 1992

Presentation by Paul A. Strassmann

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Projected Defense Operations (1991 and beyond)

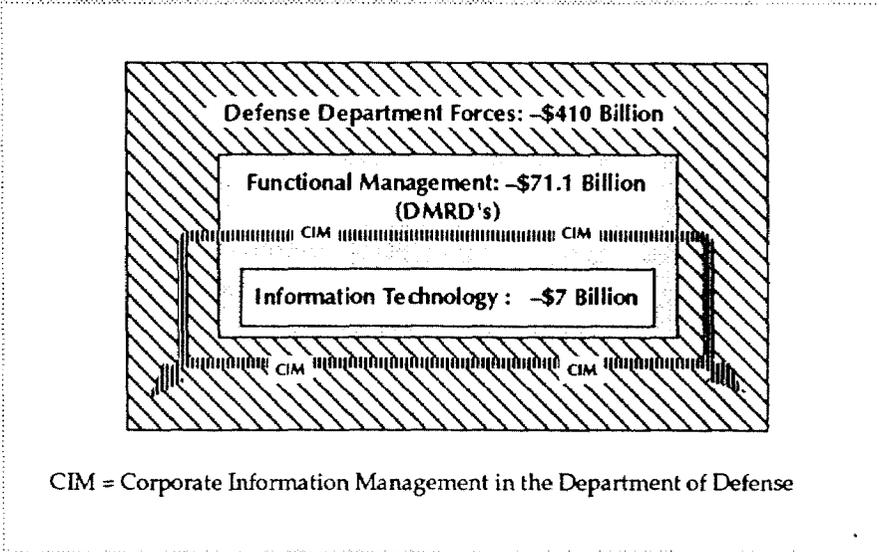


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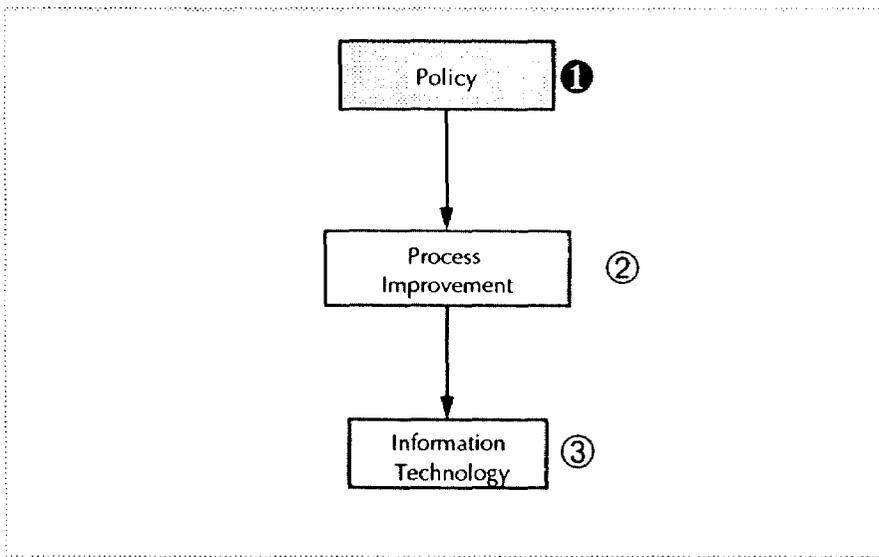
The Context For Today's Discussion: Tasks for 1990-97



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Slide 3

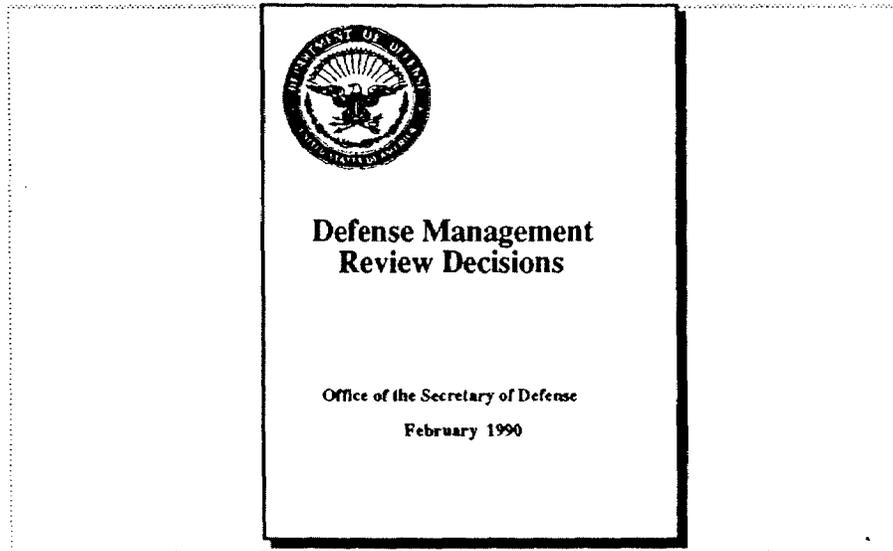
CIM Approach: The Primacy of Policy over Politics



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Slide 4

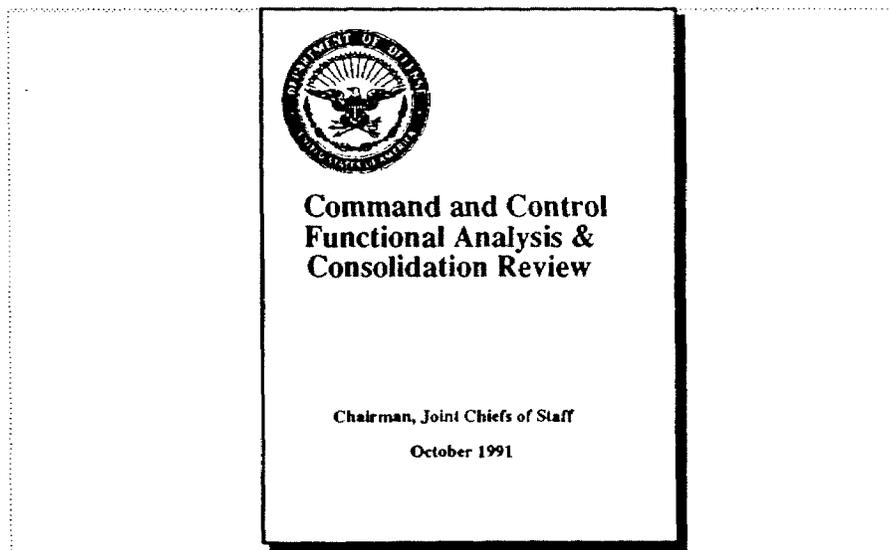
Defined Principles and Policies for Defense Management



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Doctrine and Requirements for Command and Control Systems



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From National Military Strategy Document, CM-1309-92, Section II

- The new strategy shifts its focus from containing communism and deterring Soviet aggression to a more flexible, regionally oriented strategy capable of countering a wide range of potential threats vital to US interests.
- For regional contingencies, conventional Command, Control, Communications, Computers and Intelligence (C4I) capabilities must support the rapid deployment of Joint and/or Combined forces.
- A C4I infrastructure must be globally available and capable of surging to accommodate contingencies. Resources should be interoperable and relocatable from one area to another.

Long-Term CIM Objective: Small Forces Command & Control

- The needs of small, mobile, rapidly deployed and locally managed forces shall be the priority C4I requirement.
- The C4I capabilities of the small forces shall be the same as currently possessed by large commands.

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Defense Functional Tasks for 1990-1997 (\$ Billions)

<u>Functional Category</u>	<u>Target Savings</u>	<u>%</u>
Materials and Logistics	\$46.7	66
General Administration	9.8	14
Automated Support and Systems	6.9	9
Finance, Procurement and Contracts	5.6	8
Base Operations, Facility Management	<u>2.1</u>	<u>3</u>
Total Savings (\$ billions)	\$71.1	100

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Defense Services' Cost Tasks for 1990-1997 (\$ Billions)

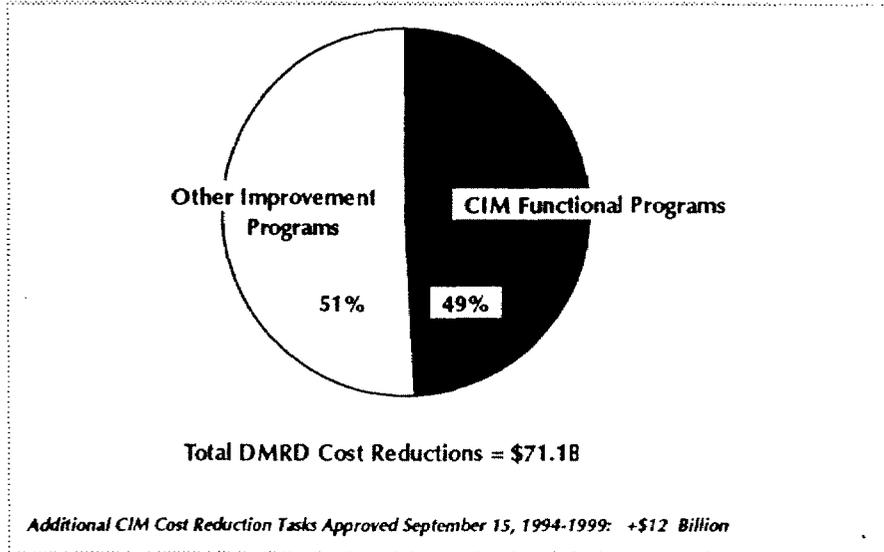
<u>Armed Service</u>	<u>Target Savings</u>
Army	\$21.0
Navy	21.5
Air Force	22.5
Defense Agencies	<u>6.1</u>
Total Savings (\$ billions)	\$71.1

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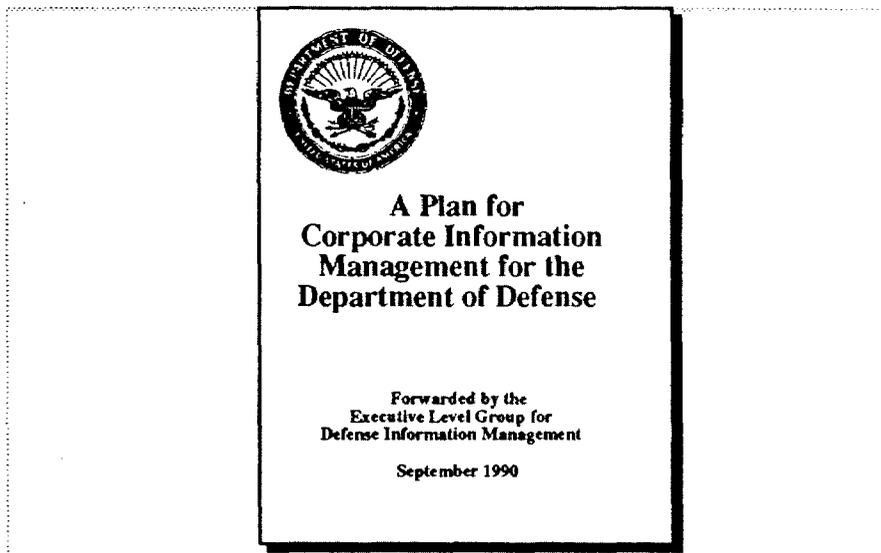
Estimated Contribution of CIM to Functional Programs



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Defined Principles and Policies for Corporate Management



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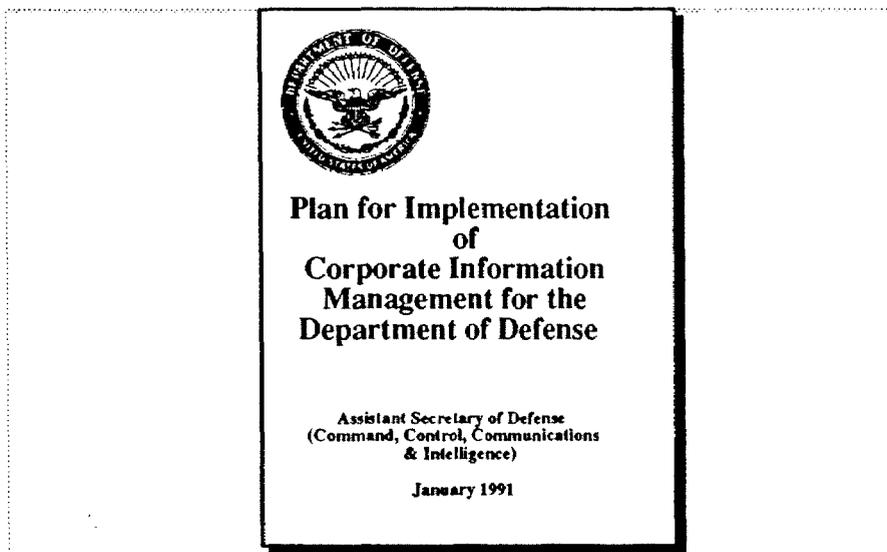
Selected Executive Level Group Principles

- Simplify business processes before systems design
- Apply economic analysis and benchmarking to functional business methods
- Provide common systems for identical functions
- Develop systems according to common methodology
- Require process and data models for all systems
- Provide a shared communications and computing infrastructure
- Mandate common data definitions and standards
- Exercise central control over security

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Proposed Implementation for Corporate Management



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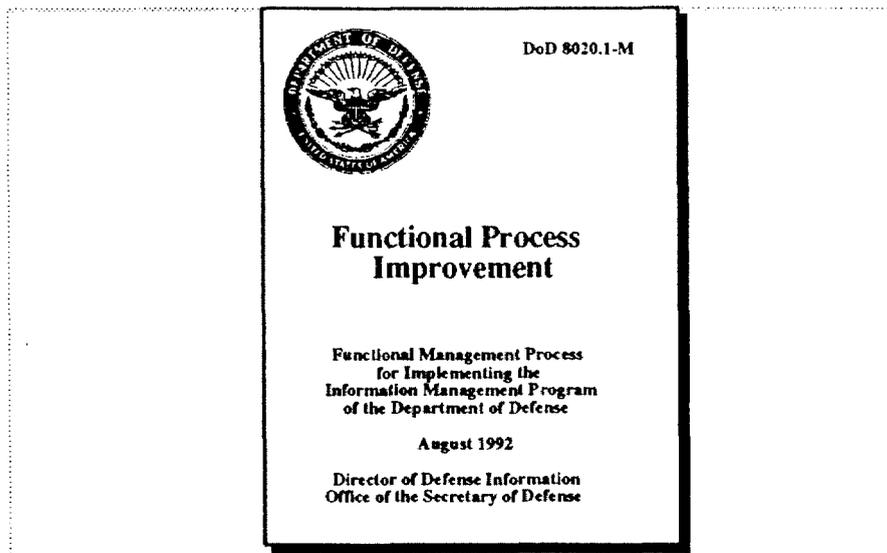
Selected Implementation Decisions

- Appoint Director of Defense Information
- Establish Center for Information Management in the Defense Information Systems Agency
- Exercise policy and budget oversight authority
- Manage central data administration and standards activity
- Develop plan for the transition to fee-for-service
- Provide guidance over software policies and practices
- Develop an architecture for DoD systems interoperability

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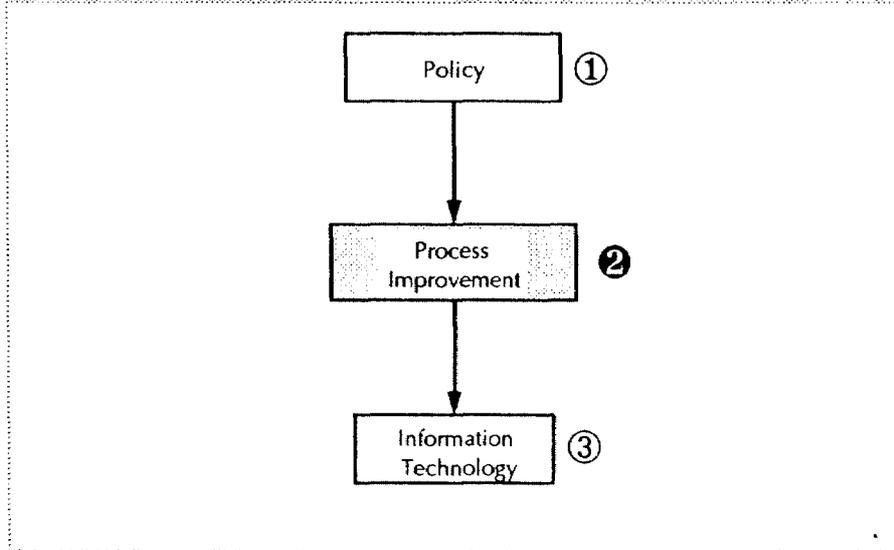
Defined Functional Improvement Process



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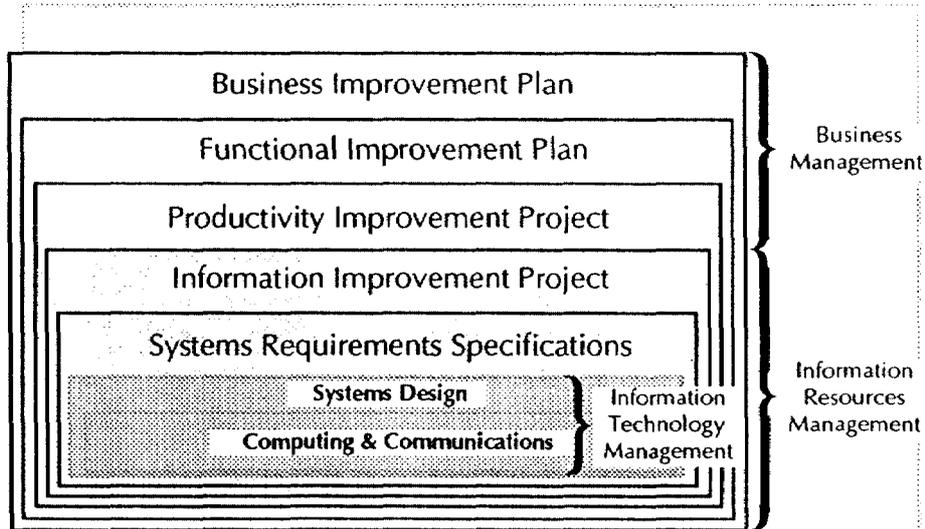
CIM Approach: The Precedence of Process over Technology



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Functional Management and Information Technology



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The CIM Business Re-engineering Process Model

- Step #1: Business Process Modeling "As-Is"
- Step #2: Business Process Modeling "To-Be"
- Step #3: Value-Added Analysis
- Step #4: Functional Economic Analysis

Business Process Improvement Program

- Over 70 Business Process Improvement projects
- Example follows:
 - Undertaken by Army Directorate of Engineering & Housing.
 - Applied CIM Business Improvement Methodology
 - Designed to Streamline Engineering & Housing Maintenance.
 - Contributed to \$300 Million Savings, already reflected in budget.
 - Conducted at Fort Sill, OK 6 January - 15 April 1992.

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Cost Profile of Fort Sill Directorate of Engineering & Housing

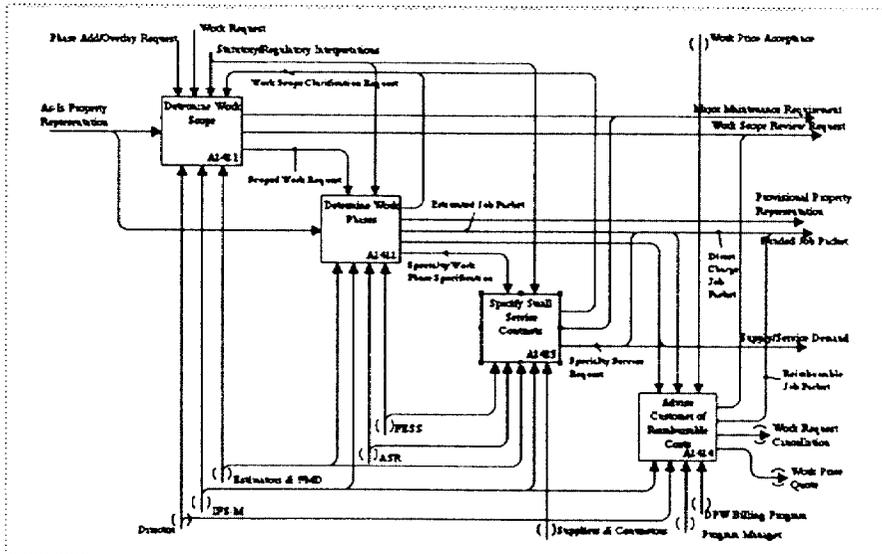
Contracts, Materials, Utilities, etc.	\$41.2M
Craftsmen Activities	\$ 7.8M
* Non-Craftsmen Activities	<u>\$12.4M</u>
Total Incurred Costs	\$61.4M

Primary Activities	\$ 9.4M
Secondary Activities	<u>\$ 3.0M</u>
* Non-Craftsmen Activities	\$12.4M

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Level 4 Business Process Model - Develop Detail Estimate



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Fort Sill 1991 Business Process Unit Costs

<u>Business Process</u>	<u>Volume</u>	<u>Unit Cost</u>
Prepare a Service Order	51,000	\$2.40/order
Approve/Disapprove Work Order Request	4,100	\$58 /request
Develop Work Order Estimate	860	\$336 /estimate
Support In-house Work Order Activities	2,400	\$197 /order
Specify Supply/Service Request	31,000	\$11.50/request
Receive Depot/Purchase Delivery	66,000	\$14.10/receipt
Issue Supply Item	167,000	\$7.30/issue
Issue Work Order Supply Items/order	15 items	\$109 /order
Process In-house Work Order	1,900	\$364 /order
Process In-house Work Order with Estimate	500	\$700 /order
Process Contracted Job Order	240	\$788 /order
Provide Construction Order Engineering	250	\$7490 /order
Provide Construction Order Contracting	120	\$2860 /contract

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Non-Value Added Activity Analysis

<u>Activity/Process</u>	<u>Reference</u>	<u>Module</u>	<u>Actual Cost</u>	<u>Unit Cost</u>
*Validate Property Reqmnts	A2415	A	\$128,890.44	\$16.74
Submit Requirements	A2411	A	\$79,868.17	\$10.37
Determine Special Interests	A2412	A	\$42,813.33	\$5.56
Prioritize Requirements	A2414	A	\$10,439.42	\$1.36
*Classify Accounts	A2416	A	<u>\$659.18</u>	<u>\$0.09</u>
Total Cost			\$262,670.55	\$34.11
Total Non-Value Added Cost Content			<u>\$129,549.62</u>	<u>\$16.83</u>
Total Potential Cost			\$133,120.93	\$17.28

* Activities classified as not adding Value-added

Note: Estimated Production Qty: 7,700

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1991 Candidates for Examination as Non-Value Added Activities

<u>Activity Description</u>	<u>Refer #</u>
Status Work Progress	A2455
Monitor Contract Performance	A123322
Validate Property Maintenance & Repair Requirements	A2415
Write Contract Modifications	A123323
Fund Supplies and Services Demand	A122
Inspect Cleanliness of Quarters	A331
Dispose of Reusable Items	A1265
Expedite Delivery	A1235
Mitigate Hazardous Material Spills	A442
Prepare for Mobilization & Disasters	A46
Approve Worth of Constr Projects	A213
Provide Relocation Assistance	A326
Request TRADOC Demolition Approval	A252
Track Local Property Rentals	A322
Stage Work Materials	A2442
Perform Thermographic Surveys	A341
Close Work/Service Orders	A2456
Identify Non-Utilized Buildings	A251
Coordinate Post-Award Meetings	A123321
Classify Accounts for MR	A2416
Determine Need For Detailed Estimates	A2413
Expedite Work Material	A2443
Release Work Material	A2444
Inspect for Completion/Beneficial Occupancy	A235
Conserve Historic Buildings	A4313

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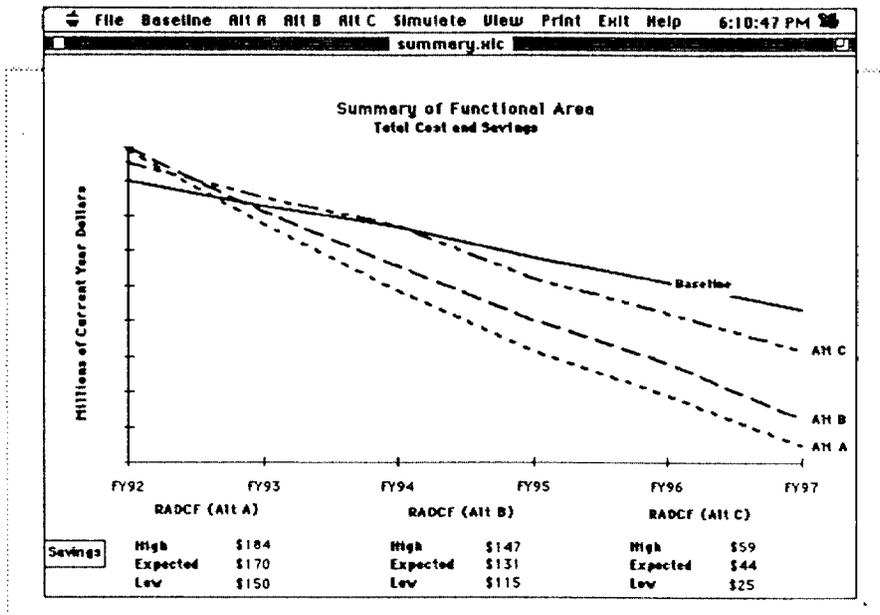
Functional Economic Analysis

- Quantifies costs and benefits using Discounted Cash Flow analysis.
- Accounts for risks.
- Applies to decisions involving existing and proposed:
 - Business methods & Information technology
- Focuses on Operations/Management ratio as the measure of "overhead cost" efficiency (the DoD Tooth/Tail ratio).

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Defined Steps in Functional Process Improvement

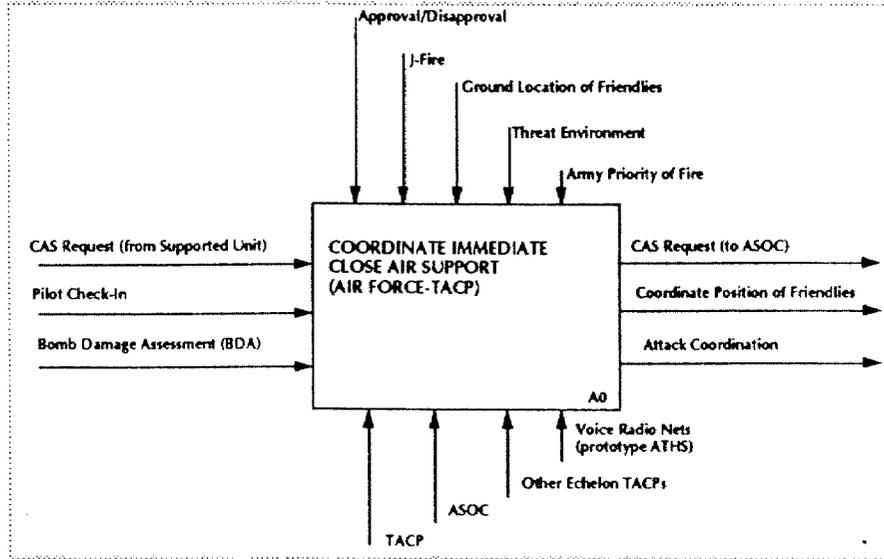
- #1: Establish Process and Data Baselines
- #2: Establish Information System Baseline
- #3: Perform Activity Modeling
- #4: Perform Data Modeling
- #5: Select Improvement Alternatives
- #6: Prepare Functional Economic Analysis
- #7: Prepare Data Management Plan
- #8: Prepare Technical Management Plan
- #9: Execute Approved Process Changes
- #10: Develop Information Systems

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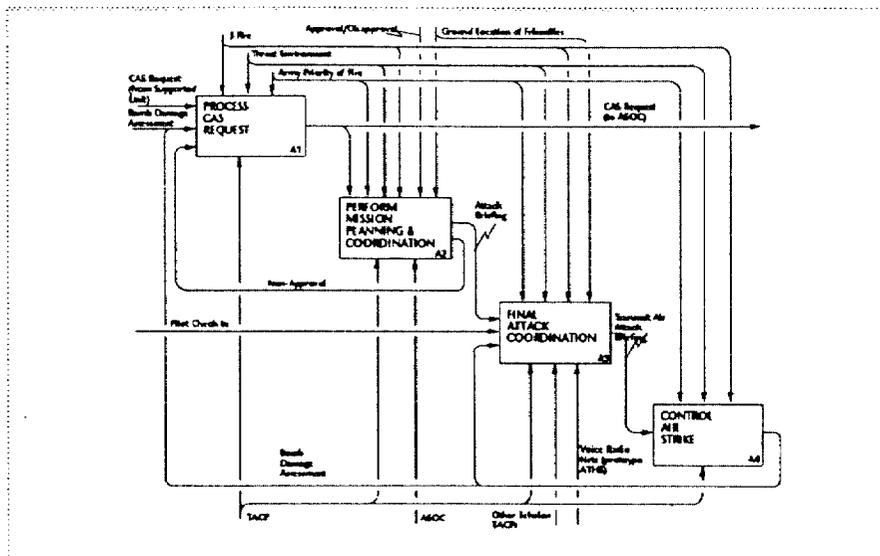
How to Simplify: Air Force Close Air Support – Top View



ASDCI, Director of Defense Information | 9/19/92 | Page 29 of 38

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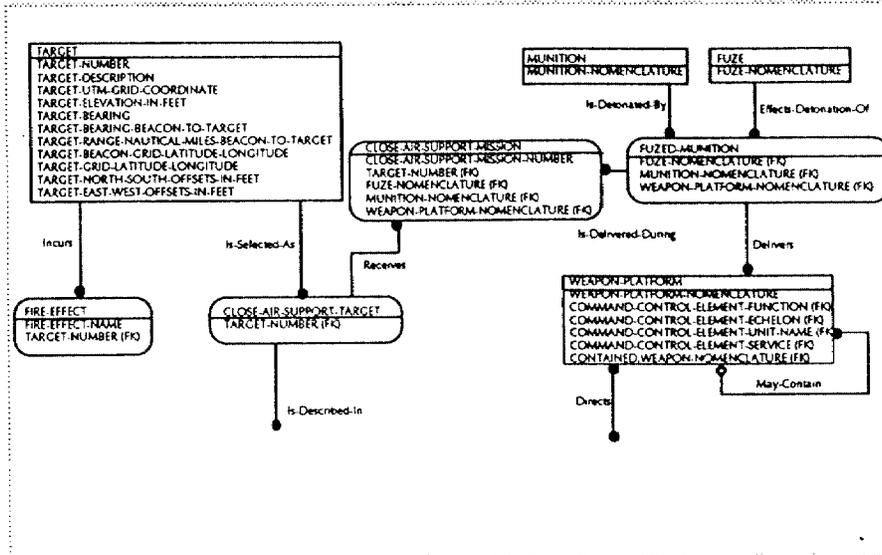
How to Simplify: Air Force Close Air Support - Second Level



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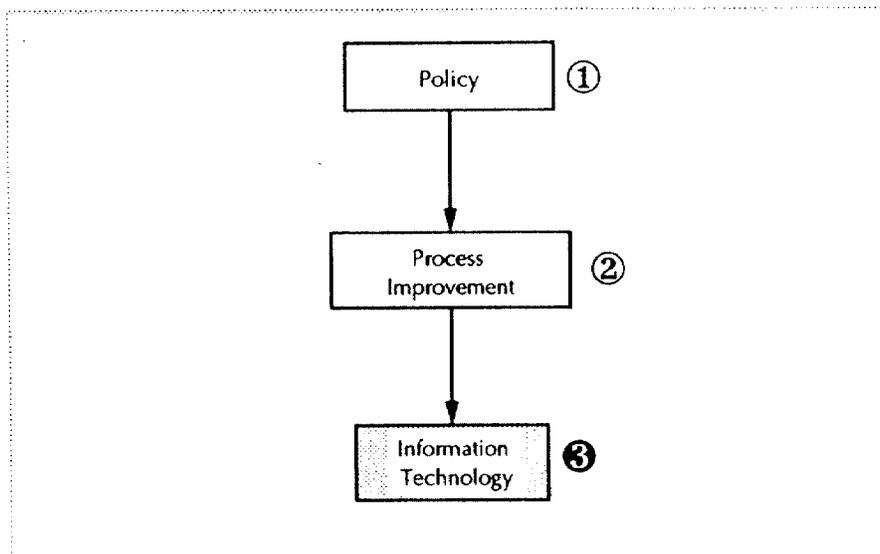
How to Simplify – Portion of Data Model of Close Air Support



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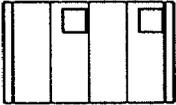
CIM Approach: Technology Modernization



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Current Defense Information Infrastructure - Data Processing



1,700 Data Processing Installations

- Average age over 11 years;
- Labor-intensive. Insufficient automation;
- Inadequate protection against deliberate attack;
- Do not share workloads and cannot act as back-up.



38 Major Central Design Organizations

- Excessive maintenance; long development cycles;
- Labor-intensive and non-standard development;
- Software maturity levels less than 1.



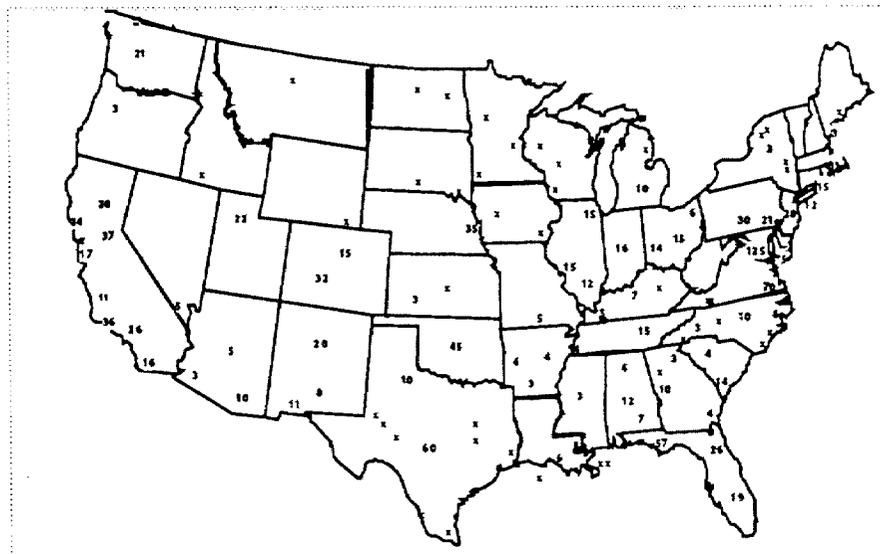
650,000+ Workstations and Terminals

- Growth chaotic and costly;
- A security exposure; lack of interoperability;
- Improvised applications, incompatible data-bases;
- High training and support costs.

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DoD Information Processing Centers



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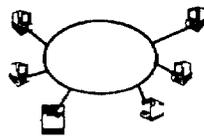
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Current Defense Information Infrastructure - Communications



102 Long Distance Networks

- Constructed to support traffic for specific organizations or applications.
- Costly lack of interoperability.
- Labor intensive.
- Poor capacity utilization.



10,000+ Local Area Networks

- Supports local preferences only.
- Not interoperable.
- High support and maintenance costs.
- Major security exposures.

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DoD Information Management Doctrine - Management

- Establish technical systems integration capabilities as a core Defense capability
- Replace current over-emphasis on technology acquisition by life-cycle management of upgradeable products
- Apply business re-engineering as a continuous, incremental and evolutionary productivity-enhancement process
- Benchmark transaction costs against commercial services
- Define organizing principles for centralized direction and decentralized implementation

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The American Solution to Royalist Governance

- The Federalist Papers - the basis of U.S. Government
- The great innovation of USA: Layered Governance
- The role of the Bill of Rights
- The concept of Retention and Delegation of Functions
- The concept of Due Process
- The concept of the Separation of Powers

Missing : An Approach to DoD Systems Governance

- "Open Systems" is just a technical solution.
- What is the DoD Equivalent of Layered Governance?
- What is the DoD Equivalent of the Bill of Rights?
- What is Retained and Delegated to Local Commanders?
- What is the Due Process for resolving Systems Contentions?
- What Separation of Powers applies to DoD Components?

About Bureaucratic Emphasis on Oversight and Control

- Waste originates not only from inadequate controls. It comes from removing the capacity of the people close enough to a problem to be able to do something about it.
- The pace of technology makes it difficult and costly to prevent Systems Chaos through total centralization of all systems controls.

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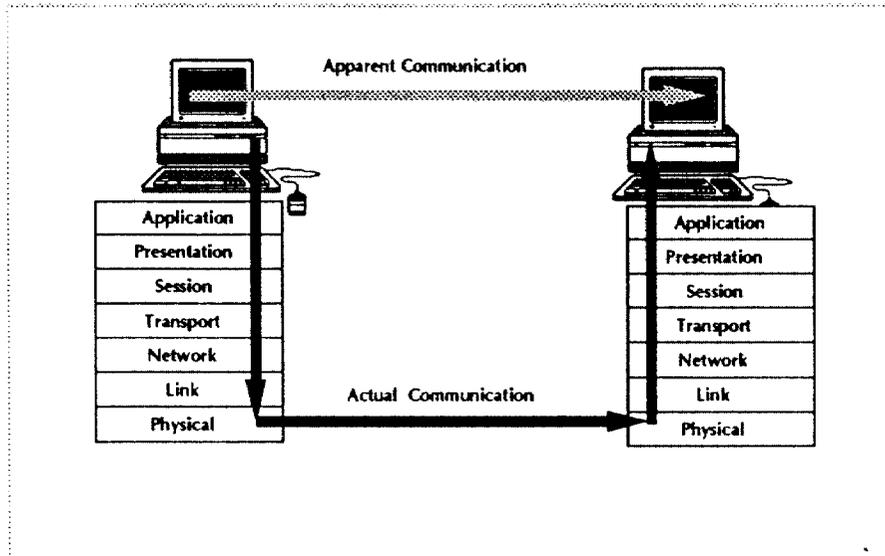
Solution: How to Achieve Integration

- Define a realistic DoD framework for Systems Governance.
- Create institutions for the governance of rapidly proliferating low-cost technologies. Current technologies favor costly local and narrow solutions.

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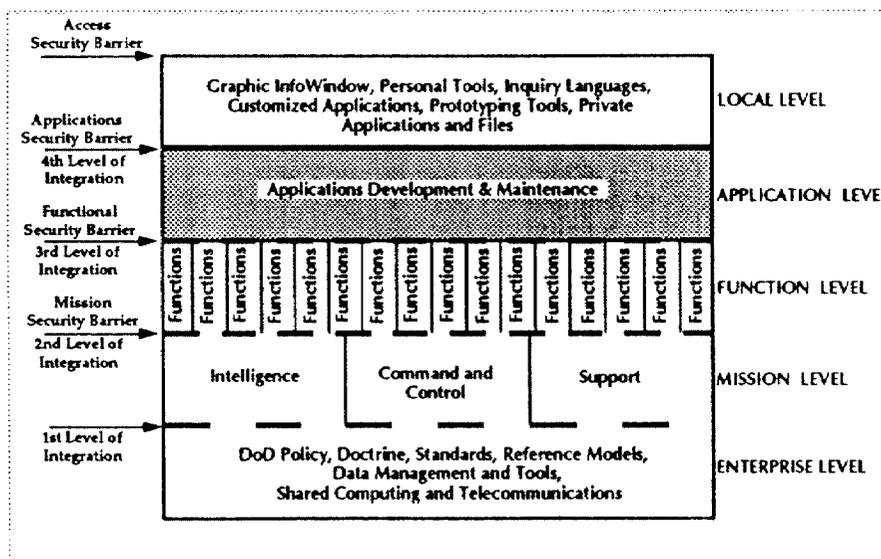
The "Open Systems" Approach to Systems Governance



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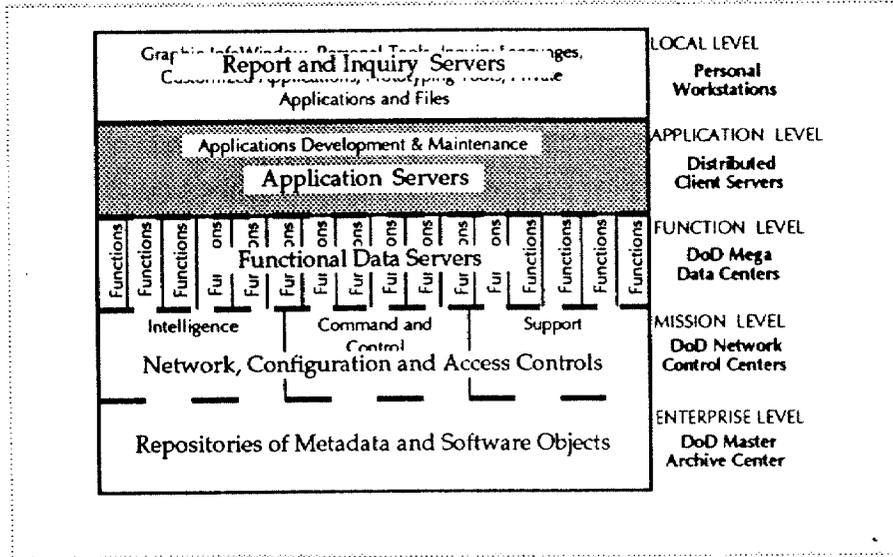
Levels of DoD Systems Integration



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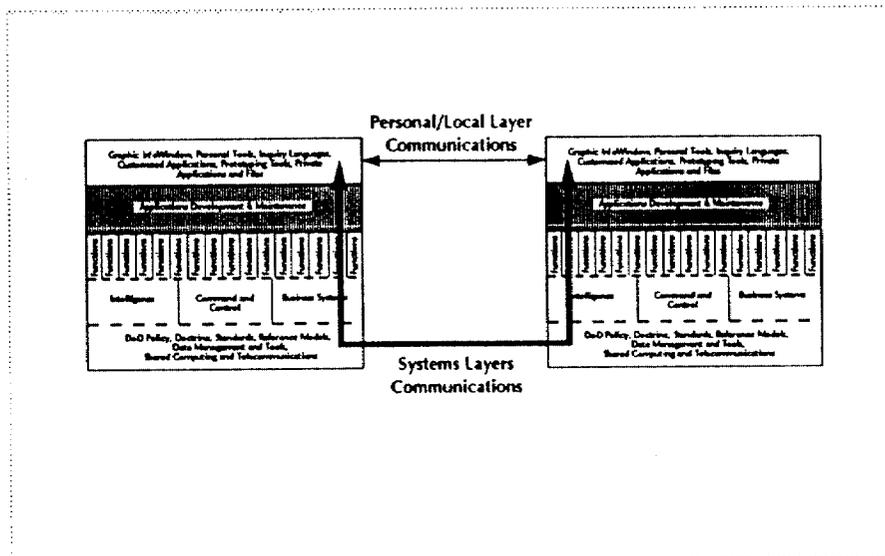
Schema for Distribution of DoD Computing Resources



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Achieving Inter-operability Through Layered Integration



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The DoD Approach

- Define the Scope and "Concept of Operations" for each Integration Layer.
- Make sure that Integration Layer Definitions are clear, unambiguous, standard, and followed.
- Put in place a participatory "Due Process" for reaching agreements about Integration Layer functions.

DoD Information Management Doctrine - Data

- Mandate single-point entry of data
- Require DoD certification of all data definitions
- Assure single source data origination stewardship
- Dictate the maintenance of data models for all applications
- Centralize database backup and archive functions
- Pursue electronic data interchange agreements with other agencies, suppliers and contractors

Growth in Data Standardization

- 38,000 data elements submitted for de-conflicting and standardization.
- Found over 150 aliases in one instance
- Data administration programs now for every DoD function

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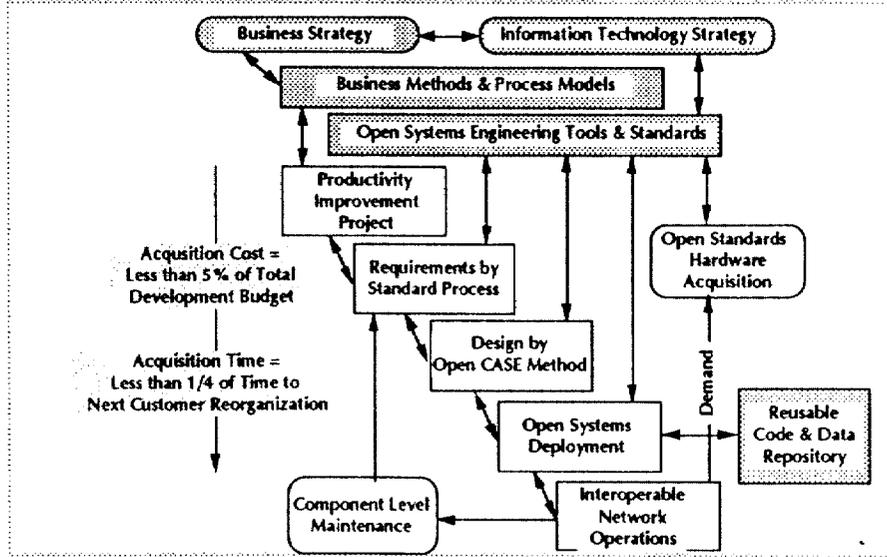
DoD Information Management Doctrine - Technology

- Use off-the-shelf hardware and software
- Lengthen technology life by continuous upgrading
- Distribute hardware and software from re-use "warehouses"
- Require single workstation for individual information needs
- Establish standardization of a soldier's Info/Window
- Commit to vendor-independent inter-operable systems
- Pursue a distributed client/server architecture
- Provide scalable computing capacity using microprocessors

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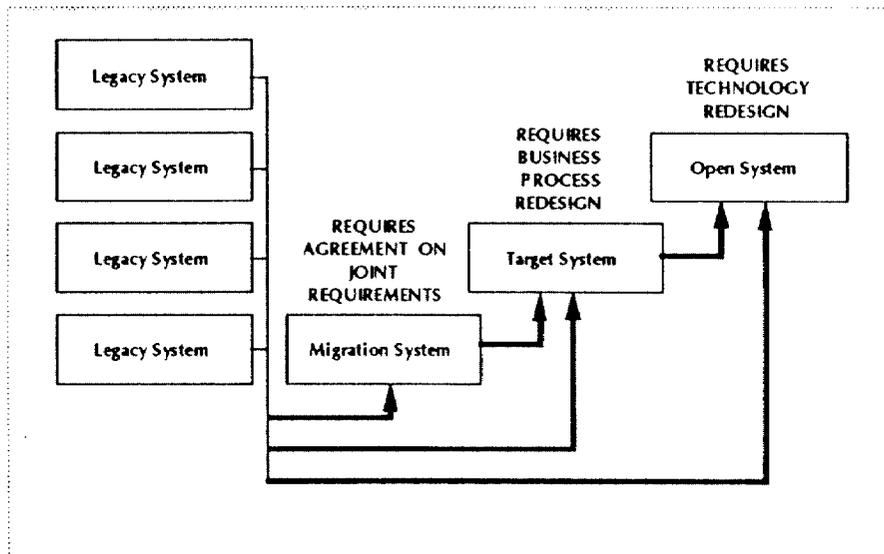
An Evolutionary and Rapid Response Acquisition Process



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Options for CIM Applications

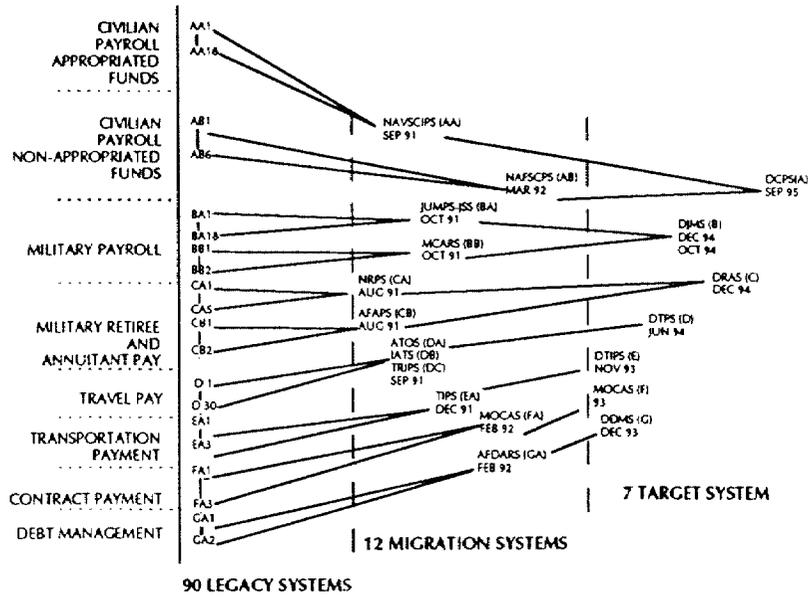


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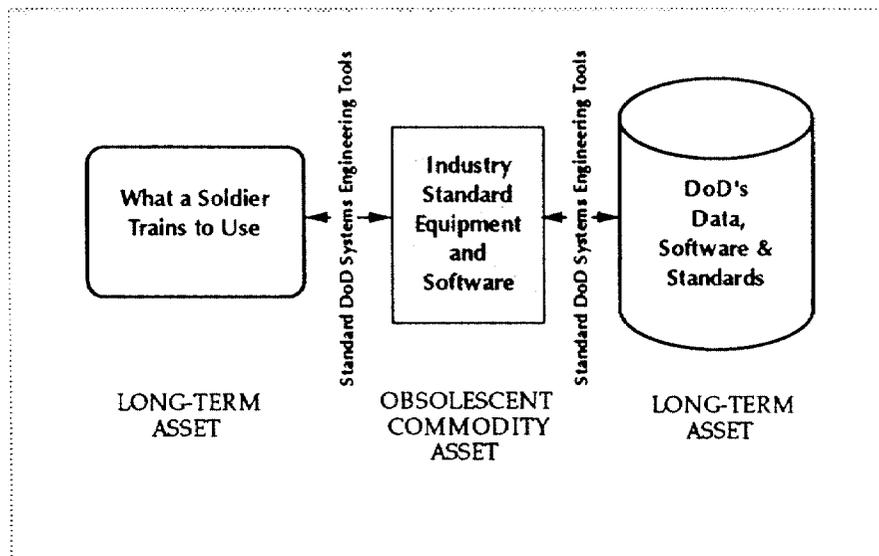
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Consolidation of Finance & Accounting Systems

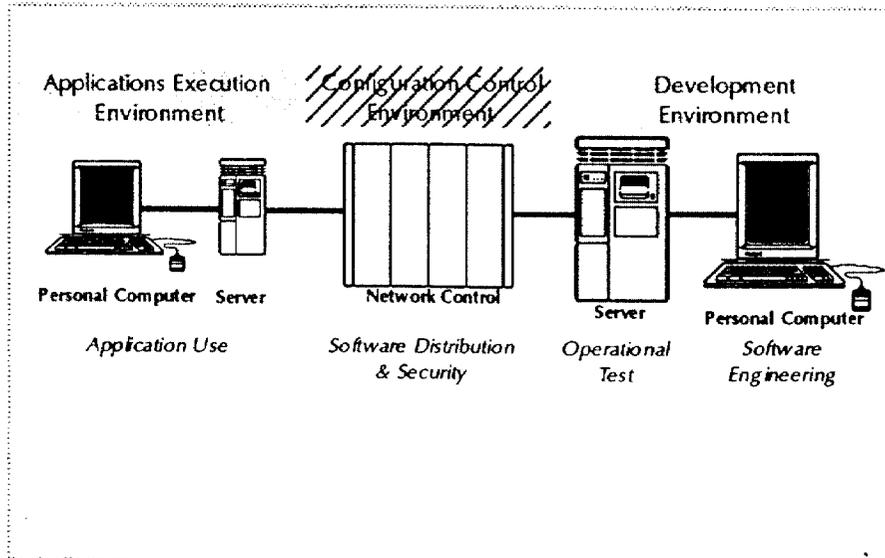


Acquiring Standard DoD Systems Engineering Tools



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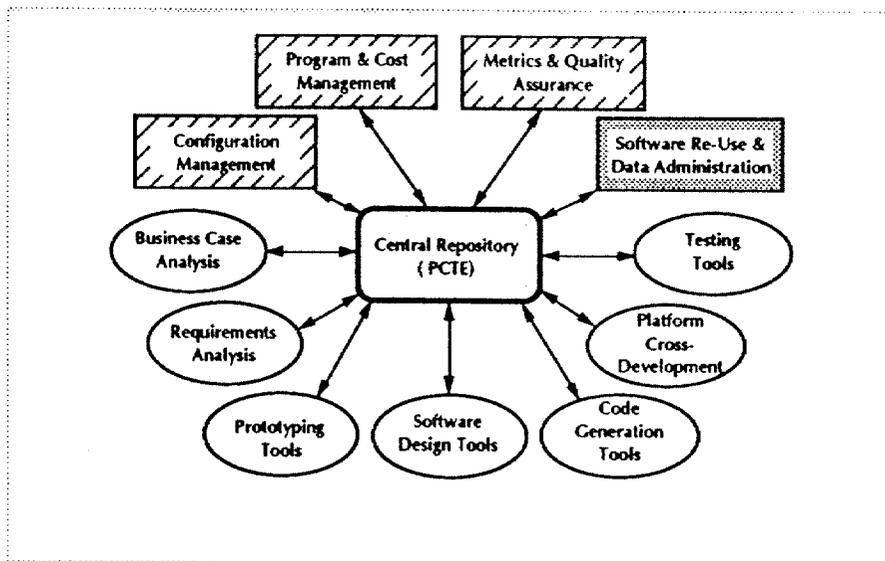
Integrated Computer-Aided Systems Engineering Environments



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I-CASE Tools and Repository

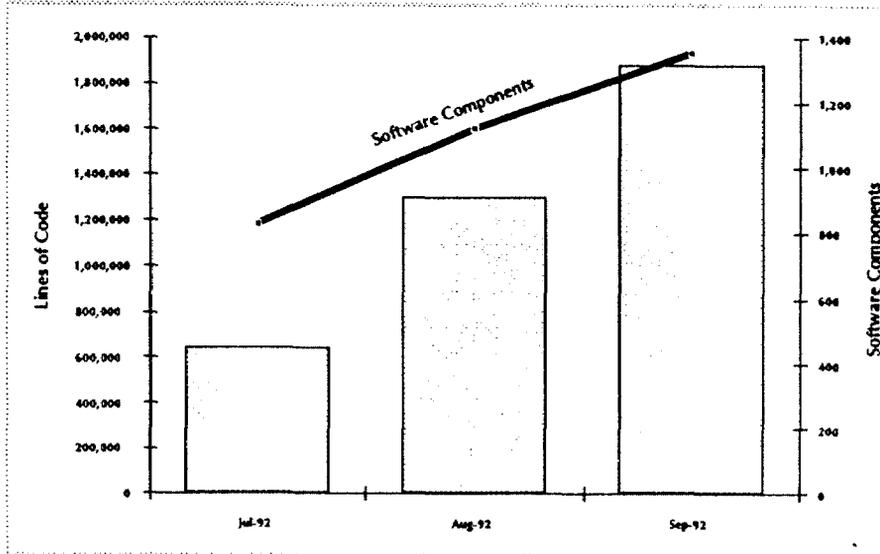


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Growth in Central Software Repository



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Ada Software Component Reuse at Gunter AFB

<u>Application</u>	<u>Lines of Code</u>	<u># of Reusable Components</u>	<u>% of Code Reused</u>
Inventory Control - LOGMARS II	18,673	10	64%
Inventory Control - LABELS *	8,846	7	73%
Stock Fund - MAJCOM	20,529	10	65%
Repairable Support	15,355	10	66%

NOTE: Written by three programmers in three days, or 983 lines of code/programmer/day. Estimated productivity gain over 1,000%.

SOURCE: Memorandum from Lloyd Mosemann, 19 June 92, report by Capt. Brown/LGSXD

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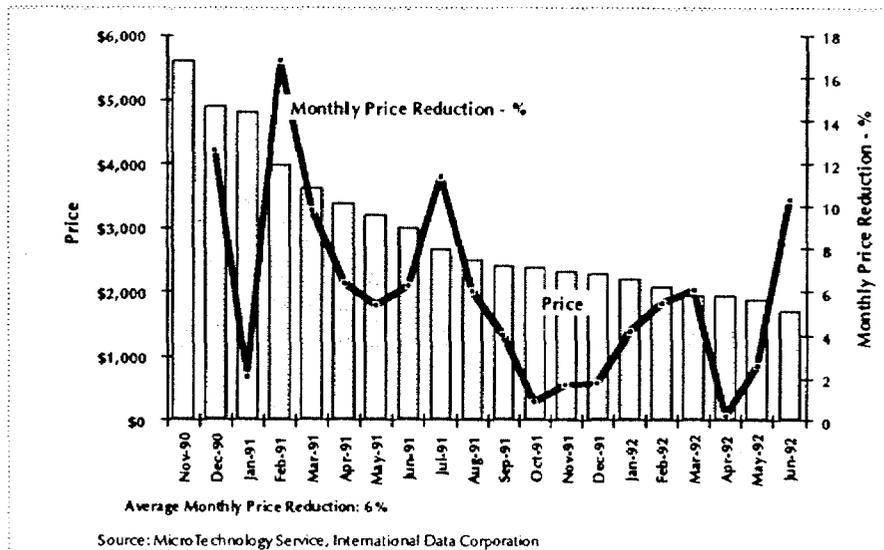
Some Software Reuse Principles

- Reuse is an integral element of Software Engineering
- Domain Analysis and Domain Models are the focus
- Will buy or license reusable components from industry
- Will certify and maintain reusable components
- Zero defects are the objective for reusable components
- Integrate reuse into systems life-cycle by means of I-CASE
- Operated by the Defense Software Repository Systems Net
- Managed by the Software Reuse Operations unit of DISA
- Define metrics to evaluate reuse success
- Provide near-terms services: Training, Acquisition, Recovery

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Prices and Price Changes of 486/33 Microcomputers



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Information Technology Re-use Organization

- Purchase only as needed, on short-term contracts
- Maintain existing inventory in DoD depots
- Reduce security risks from on-site maintenance
- Unbundle hardware from software
- Upgrade software through DoD network
- Provide protection against software intrusion
- Offer short term "leases" based on fee for service
- Maintain control of DoD microcomputer assets

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Information Technology Objectives

Information Technology Missions:

- 100% re-usable data & infinite life for data definitions.
- 80%+ re-usable code & 20+ year life on software elements.
- 80%/20% development/maintenance ratio.
- Technology asset life > 2-3 times technology innovation cycle

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Summary

- CIM is largest information technology program ever.
- CIM is integrated with DoD strategies, reflects rapidly changing environment. Adapts to shifts in defense missions.
- CIM commitment to enhance information warfare: centrally managed infrastructure, decentralized operations.
- Three keys: schedule, timing, quality. \$'s will come.
- Latest technology is the best and the least expensive. Computing power at point of use! Security dictates design.
- Lead through technology innovation. Do what current organizations cannot do.
- CIM strategy: sink deep foundations, go for lasting changes in management processes.