Strike Planning Enterprise Service Oriented Architecture

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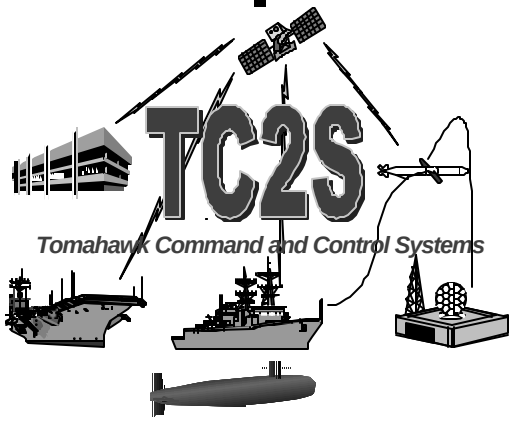
NAVAIR

CVN-70/77
CVN-21

JMPS Expeditionary

TPS
MDS/TCOMMS

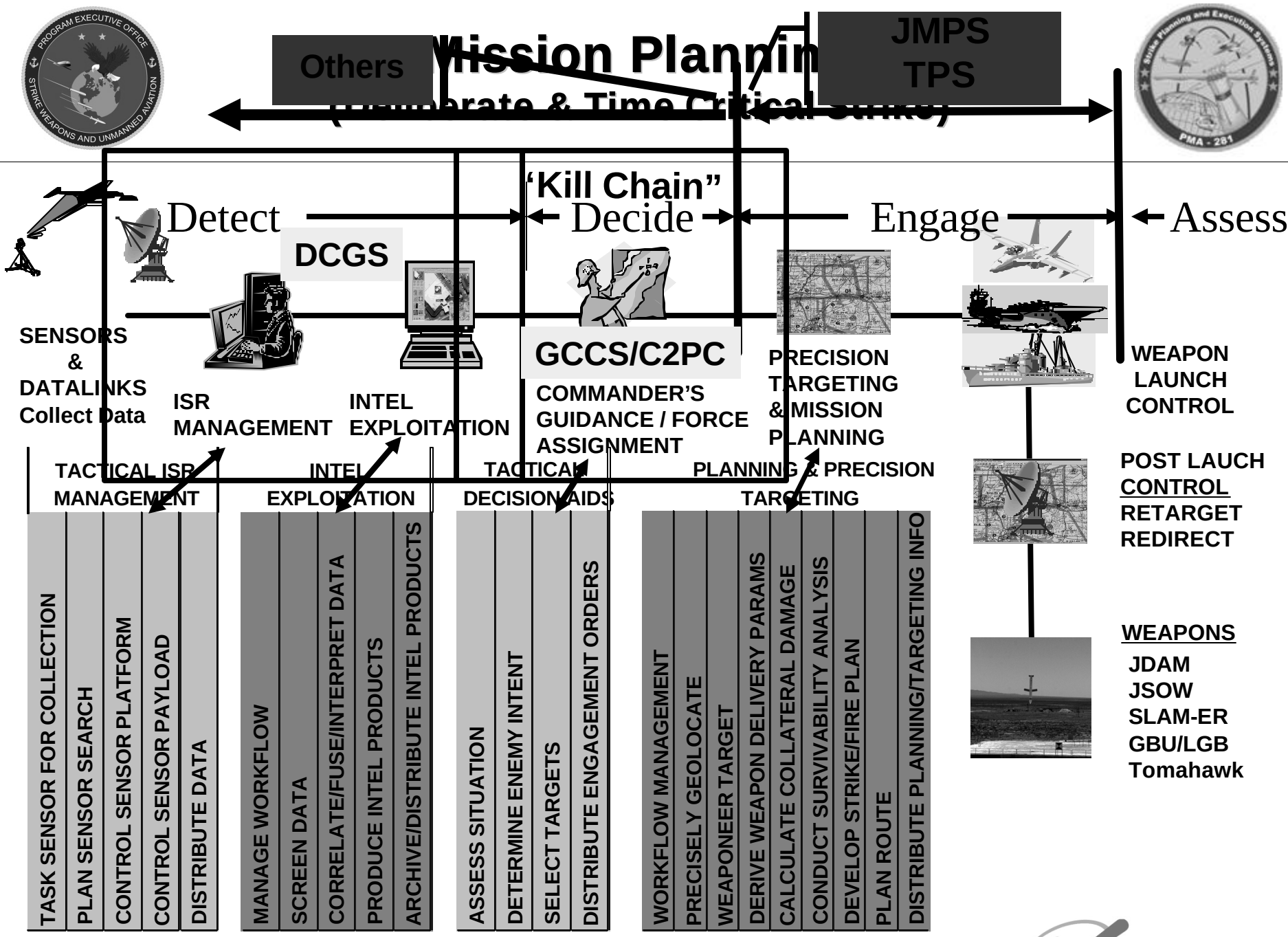
F/W
C/C
UPC



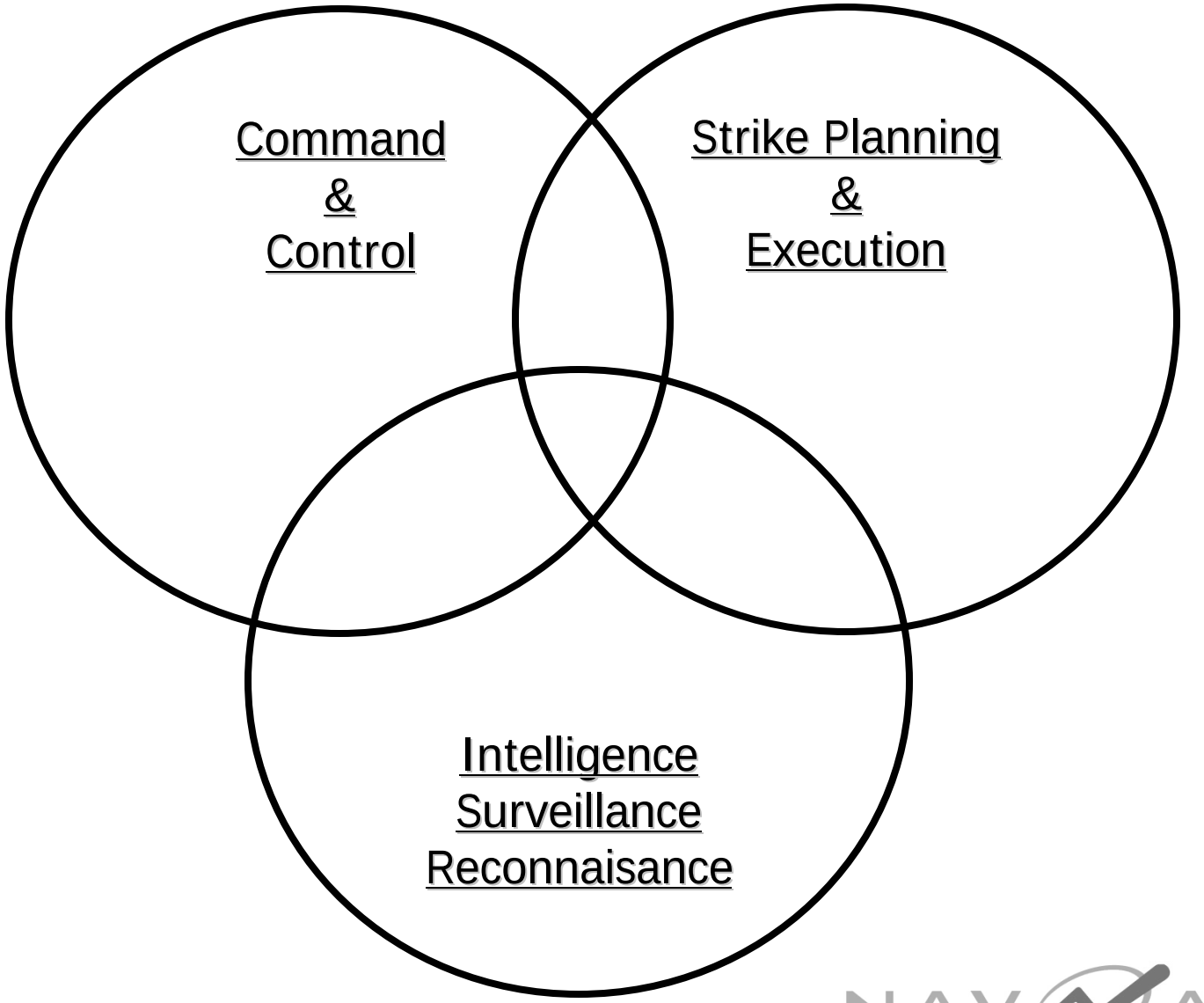
PMA281 Strategic Vision:
Be the Naval Center of Excellence for Mission (Strike) Planning and Execution

Sponsors:
N6F, N85, N86, N87, N88, N2, N89, N091C

DASNs:
DASN(IWS), DASN(AIR), DASN(MLW)


Others
Mission Planning
(Deliberate & Time Critical Strike)
JMPS
TPS
"Kill Chain"
Detect
Decide
Engage
Assess
DCGS
SENSORS & DATALINKS Collect Data
ISR MANAGEMENT
INTEL EXPLOITATION
GCCS/C2PC
COMMANDER'S GUIDANCE / FORCE ASSIGNMENT
PRECISION TARGETING & MISSION PLANNING
WEAPON LAUNCH CONTROL
POST LAUCH CONTROL
RETARGET
REDIRECT
WEAPONS
JDAM
JSOW
SLAM-ER
GBU/LGB
Tomahawk
TACTICAL ISR MANAGEMENT
INTEL EXPLOITATION
TACTICAL DECISION AIDS
PLANNING & PRECISION TARGETING
TASK SENSOR FOR COLLECTION
PLAN SENSOR SEARCH
CONTROL SENSOR PLATFORM
CONTROL SENSOR PAYLOAD
DISTRIBUTE DATA
MANAGE WORKFLOW
SCREEN DATA
CORRELATE/FUSE/INTERPRET DATA
PRODUCE INTEL PRODUCTS
ARCHIVE/DISTRIBUTE INTEL PRODUCTS
ASSESS SITUATION
DETERMINE ENEMY INTENT
SELECT TARGETS
DISTRIBUTE ENGAGEMENT ORDERS
WORKFLOW MANAGEMENT
PRECISELY GEOLOCATE
WEAPONEER TARGET
DERIVE WEAPON DELIVERY PARAMS
CALCULATE COLLATERAL DAMAGE
CONDUCT SURVIVABILITY ANALYSIS
DEVELOP STRIKE/FIRE PLAN
PLAN ROUTE
DISTRIBUTE PLANNING/TARGETING INFO

Kill-Chain Enterprises



SOA Concepts

- Services offered over the web and within the enterprise using XML-based standards
- Implementation of services using component-based software engineering (CBSE) architecture
- An architectural, procedural, and organizational mindset that is service-oriented, and which can merge the web services technology and CBSE potential into a synergisitic whole

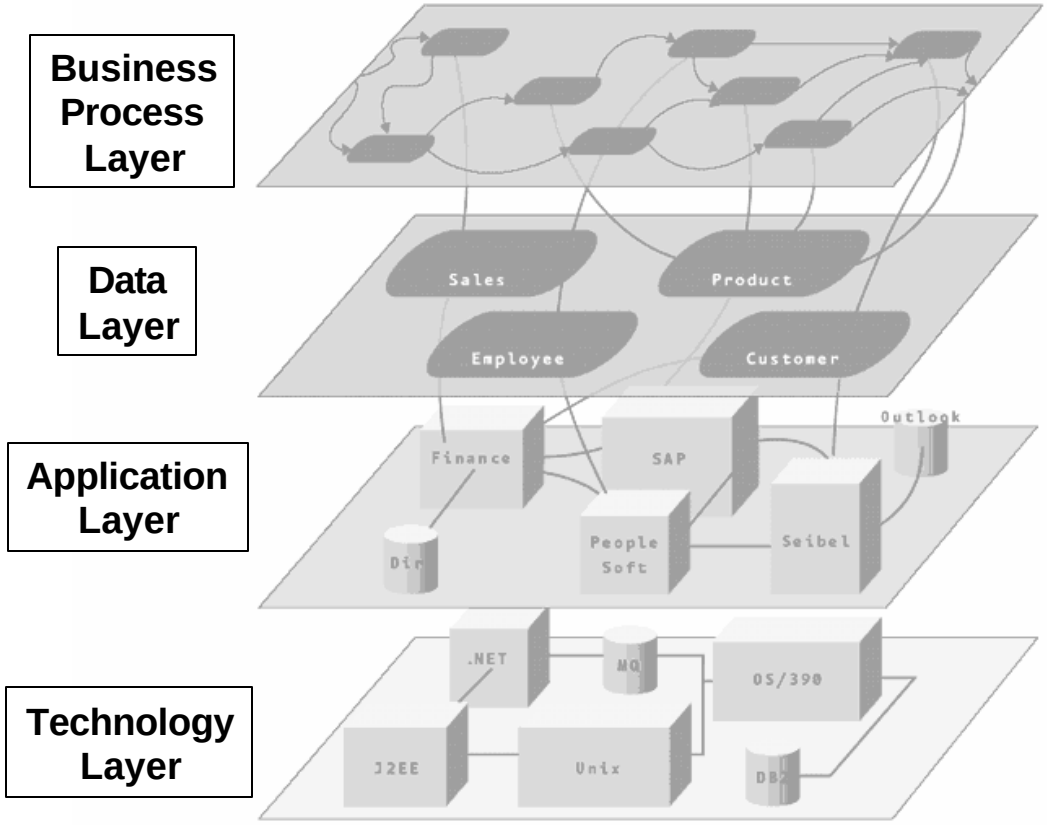
McGovern, James, et al. Enterprise Service Oriented Architectures, The Netherlands: Springer, 2006

SOA Benefits

- Focus on Business Processes
  - Source of Enterprise “Competitive Advantage”
  - Separation of technology platforms from the business services offered, and from the business logic that implements those services
- Speed and Agility
  - Respond quickly to changes in Business Processes
  - Reduce cycle time to implement new Business Processes
- Cost
  - Re-use/Extension of available components and services
  - Federation of services

McGovern, James, et al. Enterprise Service Oriented Architectures, The Netherlands: Springer, 2006

Service Oriented Architecture



Graphic Courtesy of Microsoft Developers Network (MSDN)

Service Oriented Architecture Translation

Industry: Competitive Advantage

Kill Chain: Enterprise Differentiation

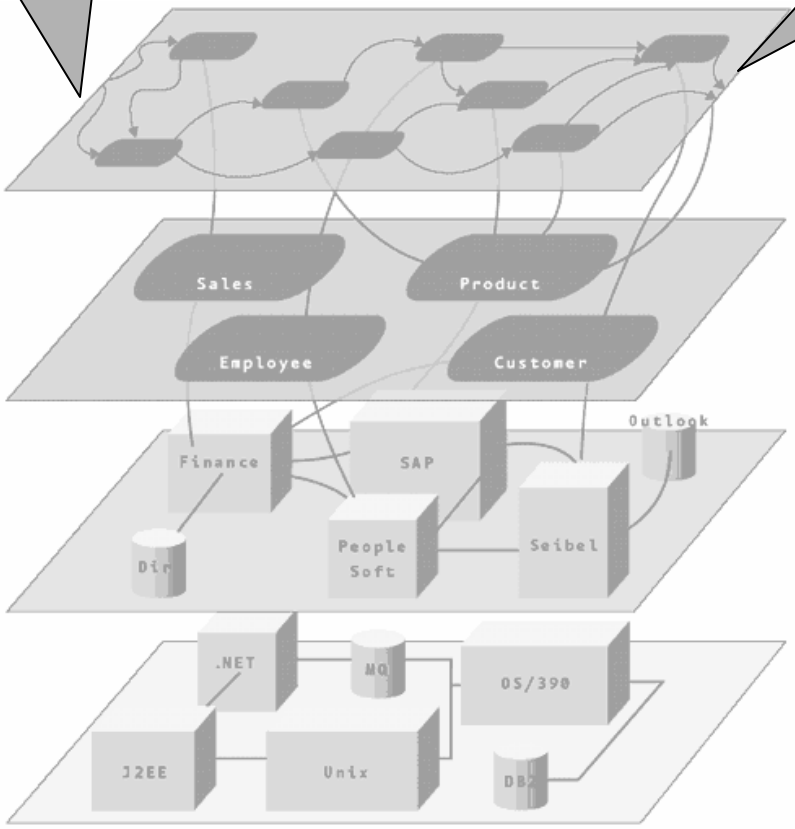
Industry

Business Process Layer

Data Layer

Application Layer

Technology Layer



Strike Planning Equivalency

CONOPS
Workflows
Use Cases
SOP/ROE

Geospatial/Mapping
Imagery
Targets
Intell/OOB
ATO/ACO/SPINS
Mission Plans

TPS/MDS
JMPS
WASP
PTW
TOPSCENE

Operating Systems
Hardware Suites
Network Infrastructure

Graphic Courtesy of Microsoft Developers Network (MSDN)

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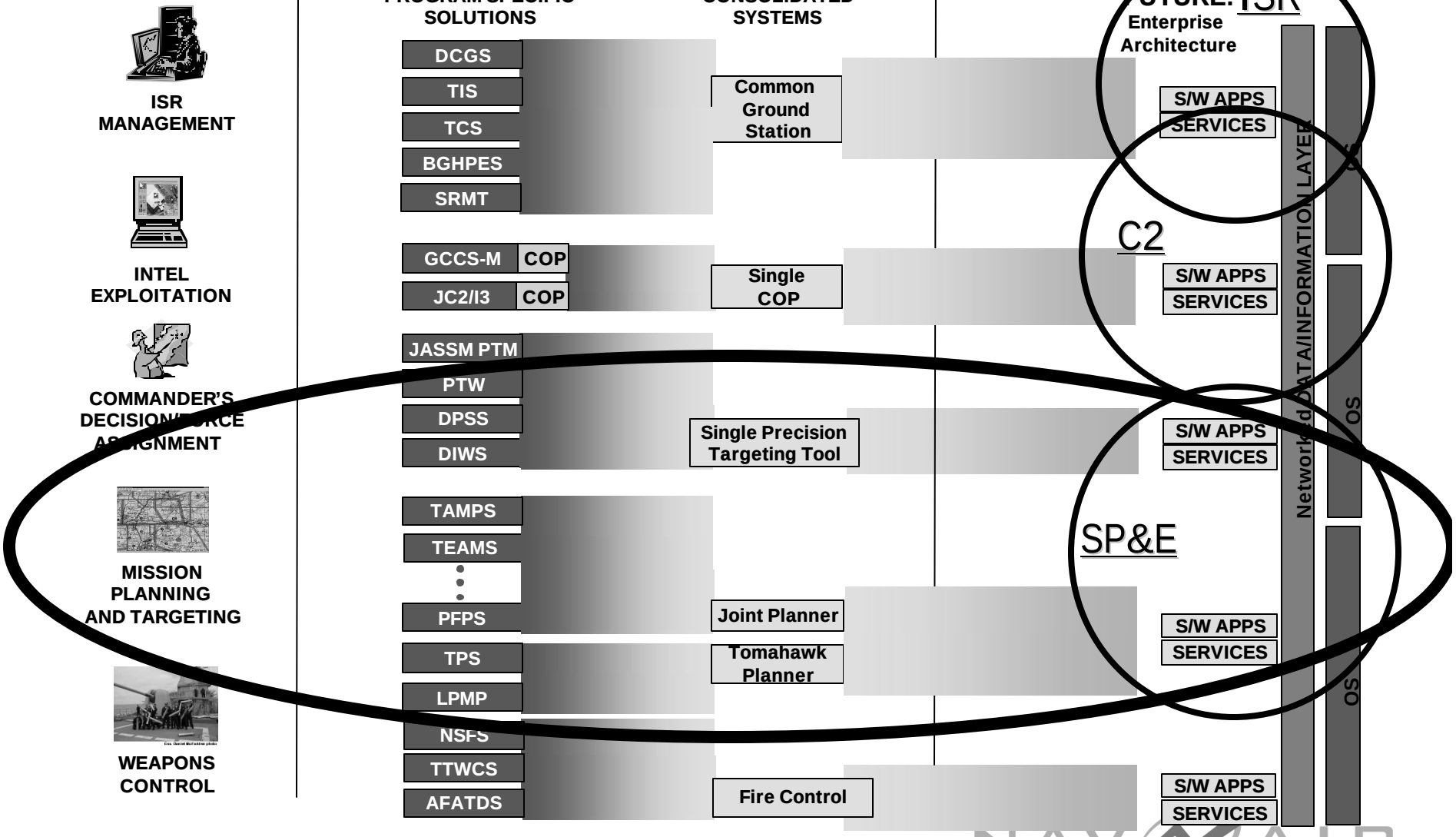
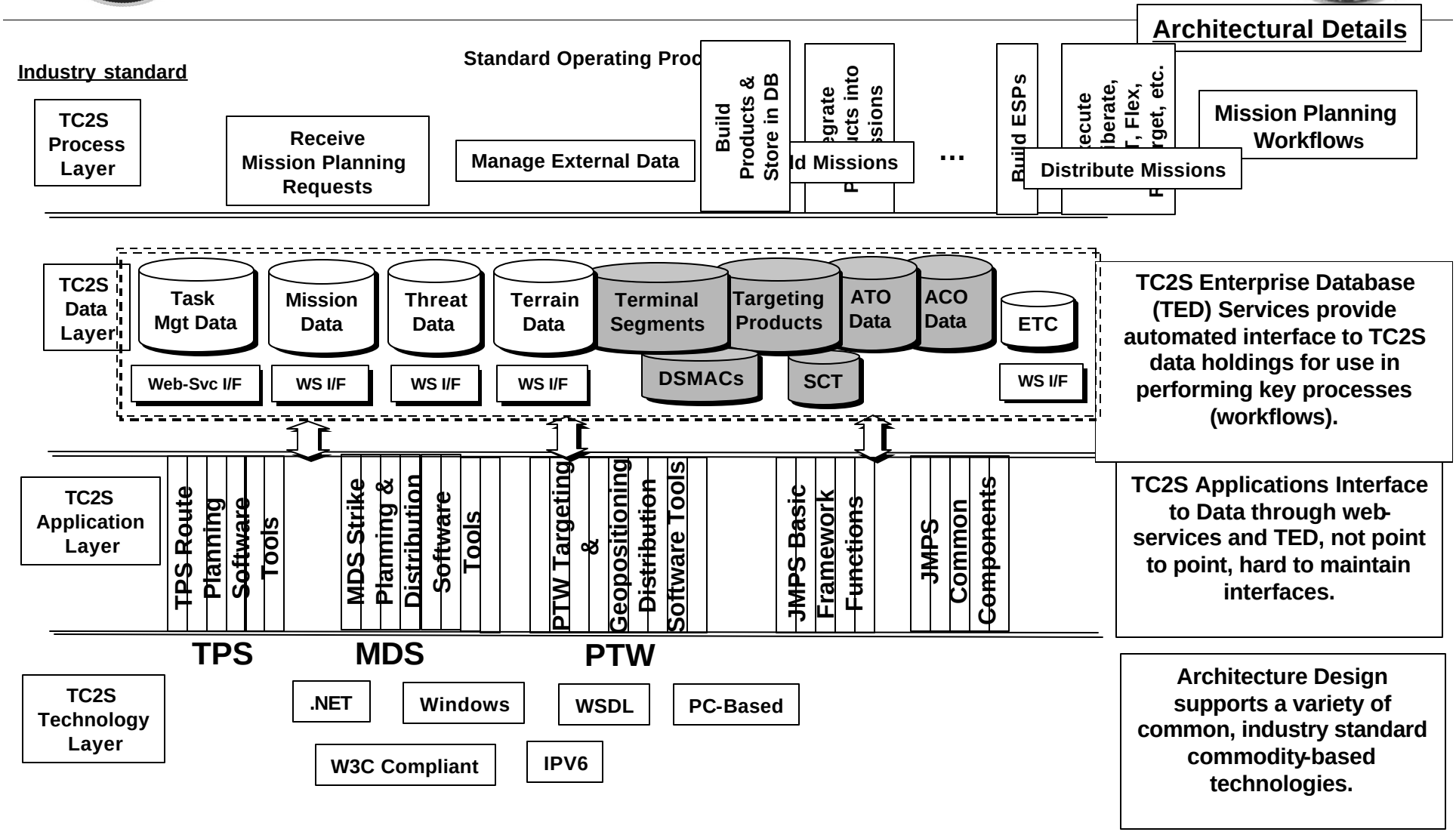
Architecture Migration



TC2S Architecture Layered View

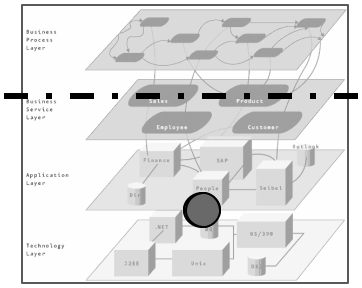


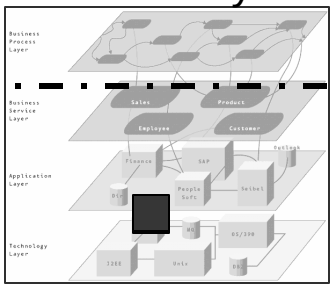
SOA & Joint

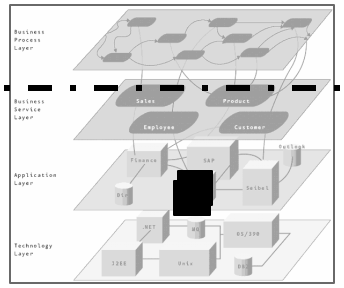
MHq/MOC Systems

AOC/CAOC Systems

NGA (Like) Systems



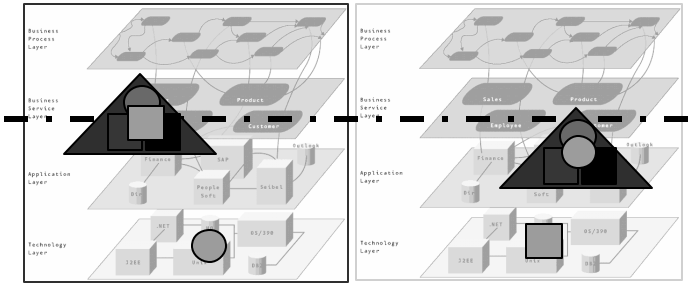




Airwing or C2 Systems

CMSA or C2 Systems

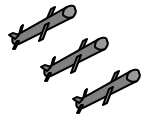
Collaboration Tools
GIG (IP comms)



JMPS TC2S

COP

- Don't care where the data is
- Services allow access to data anywhere
- Local applications synthesize products (data/workflow)



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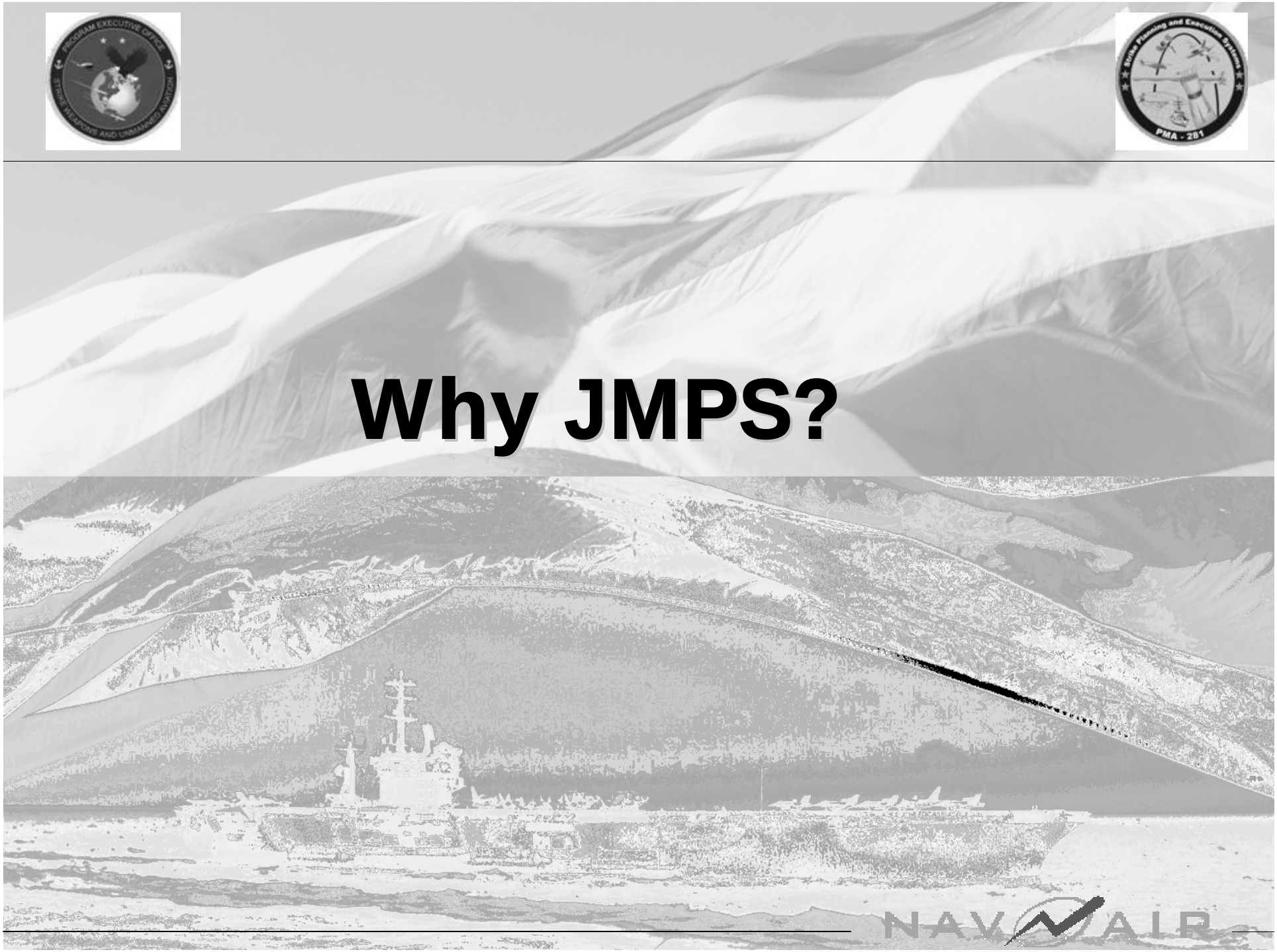
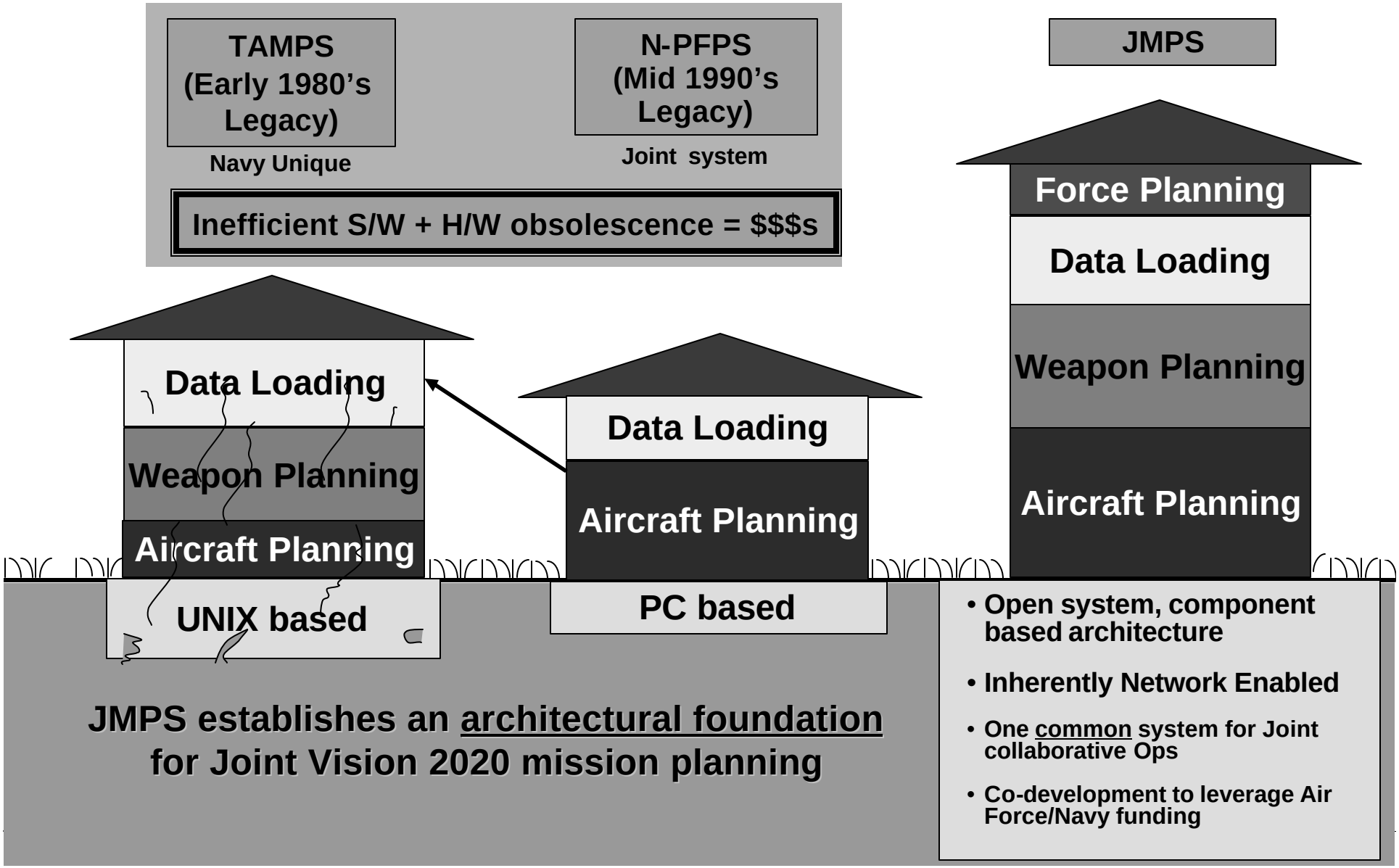
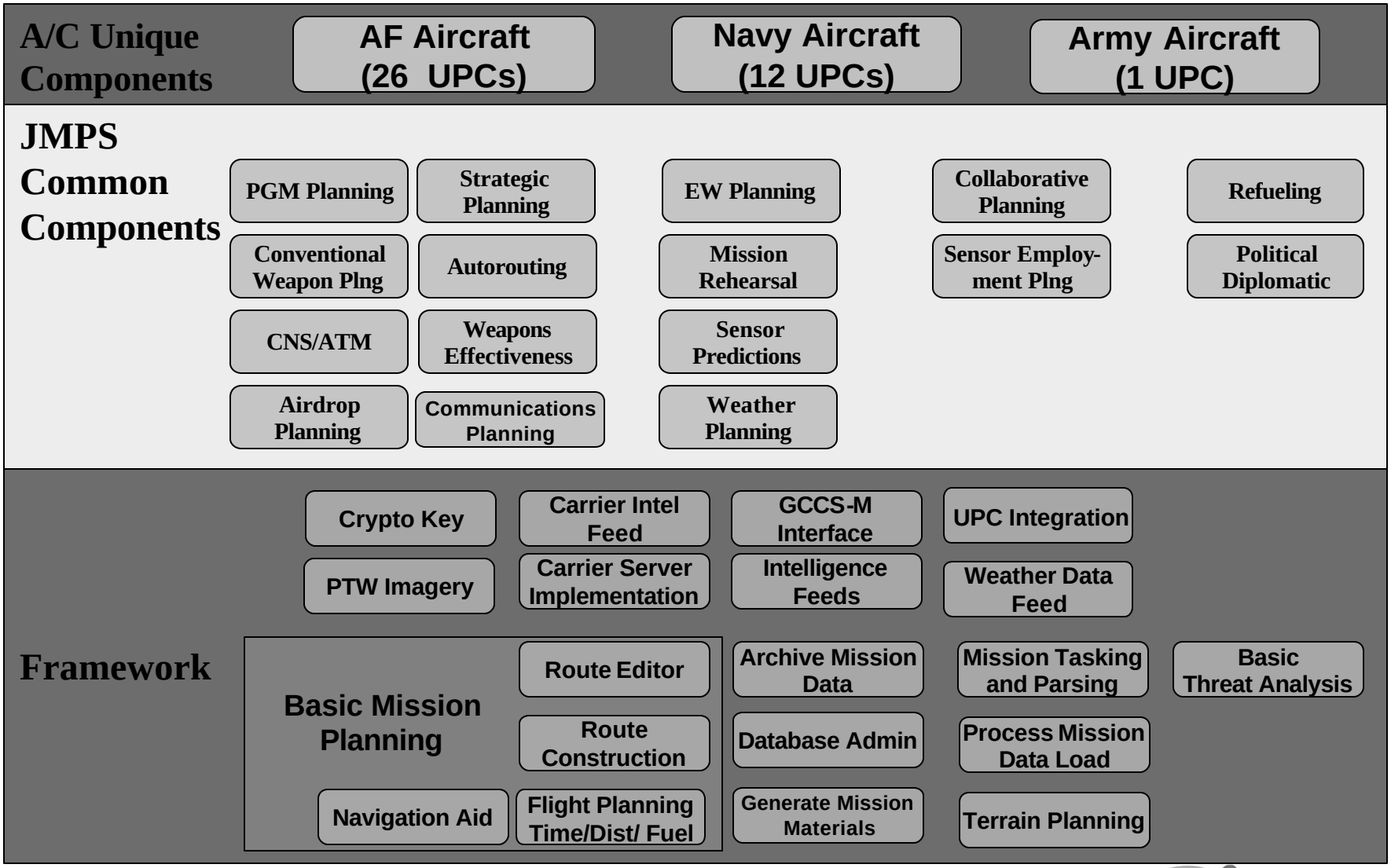
Why JMPS?



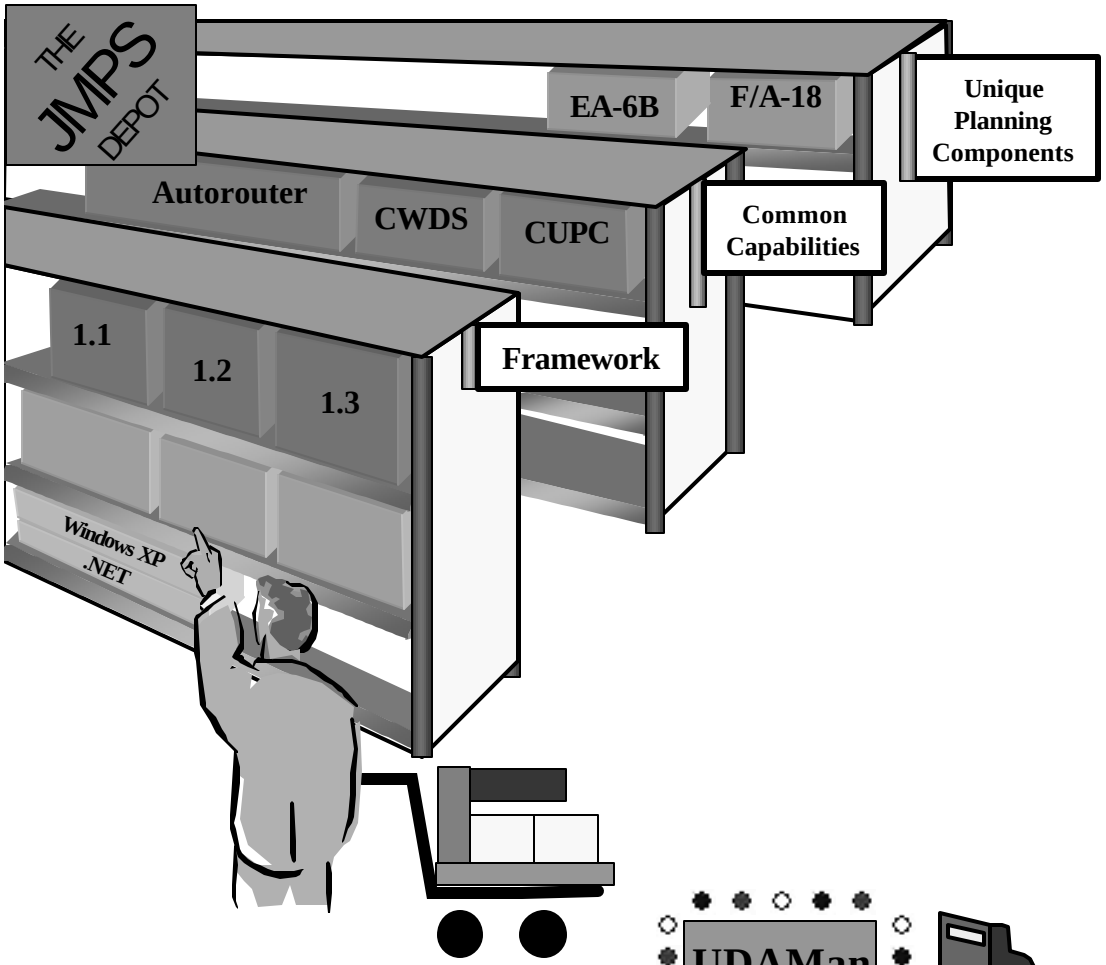
NavMPS Migration

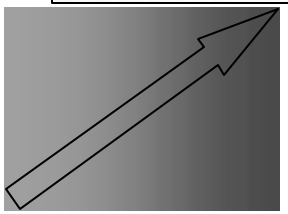


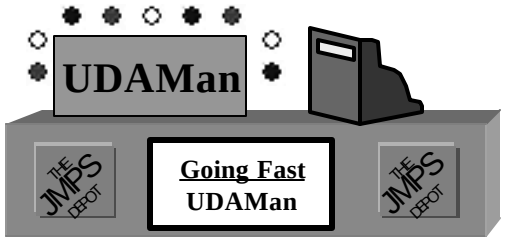
JMPS Overview



Joint Mission Planning System







JMPS F/A-18
Misson Planning Environment

F/A-18 UPC
SLAM-ER
HARM
ETIRMS
TAMMAC
ARC-210
CUPC
GPS Prediction
GPS Crypto Key
GPS Almanac
WASP
Framework

PMA-265 Boeing

PMA-201 Boeing

PMA-242

PMA-234

PMA-209 Boeing

PMA-201 Raytheon

ESC (USAF) Hill AFB

PMA-281 NGMS

Unique Planning Component
Common Component
Framework

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Mission **P**lanning **E**nvironment

Common Helo MPE

UH-1N
CH-53
CH-46
SH-60F
HH-60H

CMDL
Framework 1.2.4

Intel Planning
Mission Rehearsal
Collaboration

Future
Can be added as needed

Unique Planning Component

Common Component

Framework

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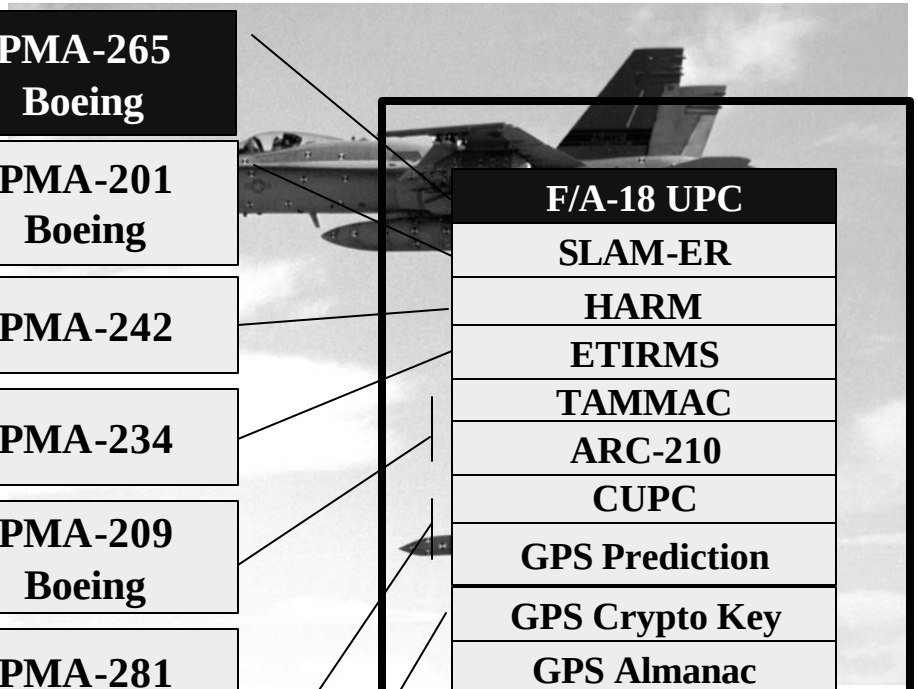
TLAM Planning to JMPS



PMA-265 Boeing

PMA-201 Boeing

PMA-242

PMA-234

PMA-209 Boeing

PMA-281

PMA-201 Raytheon

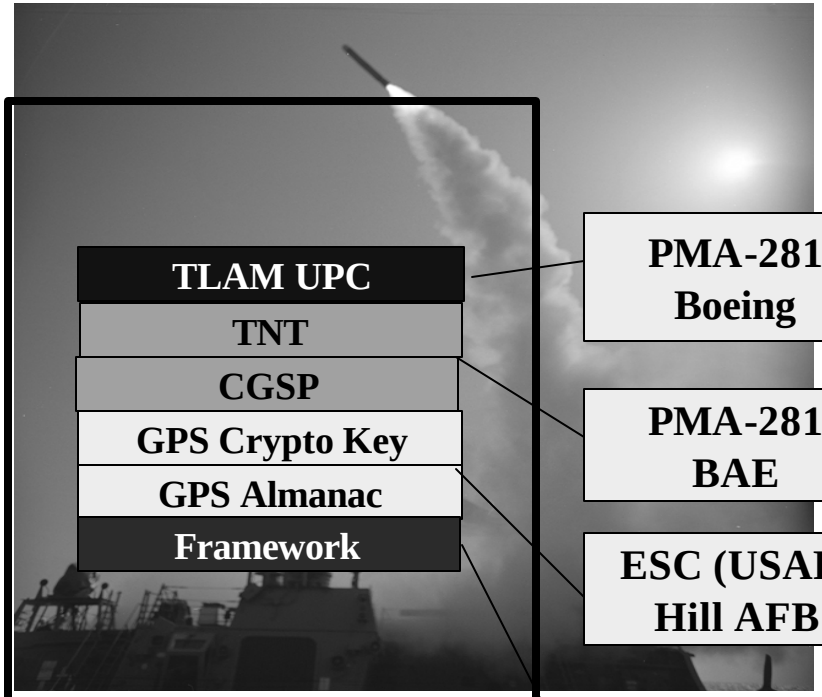
ESC (USAF) Hill AFB

PMA-281 MPEC

F/A-18 UPC

- SLAM-ER
- HARM
- ETIRMS
- TAMMAC
- ARC-210
- CUPC
- GPS Prediction
- GPS Crypto Key
- GPS Almanac
- WASP
- Framework

F/A-18 MPE



TLAM UPC

- TNT
- CGSP
- GPS Crypto Key
- GPS Almanac
- Framework

TLAM MPE

PMA-281 Boeing

PMA-281 BAE

ESC (USAF) Hill AFB

PMA-281 MPEC

PMA-281 Integration/Test/ Support

- Unique Planning Component
- Web Service
- Common Component
- Framework

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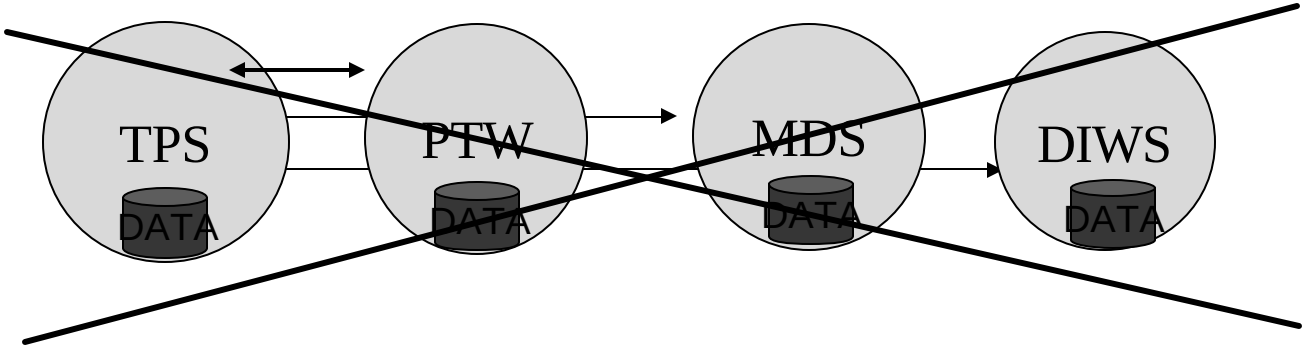
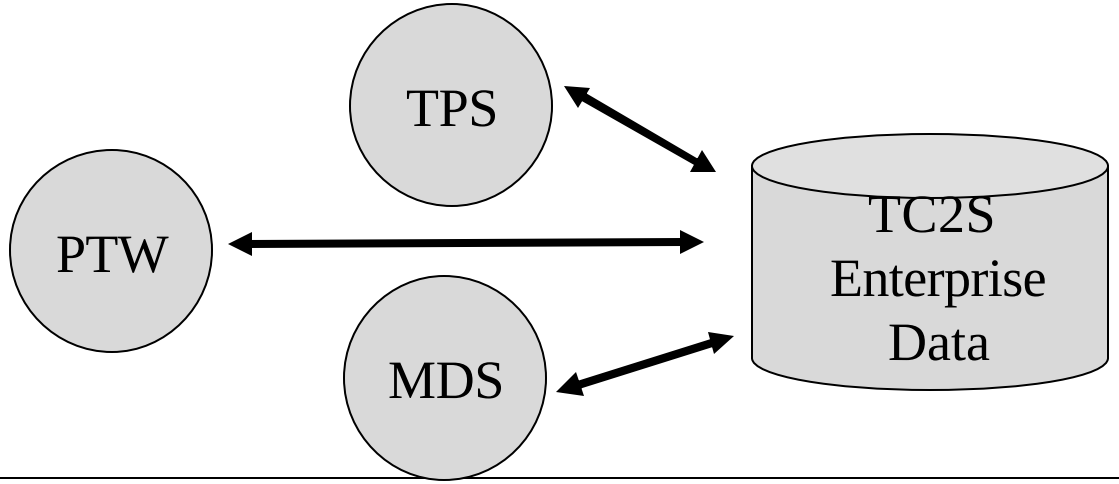
SOA Challenge

- Phase 1: Focus on the data
  - Remove the redundancy (establish TC2S enterprise data holdings)
  - Remove the costly, inefficient interfaces. (applications interact with data rather than each other)



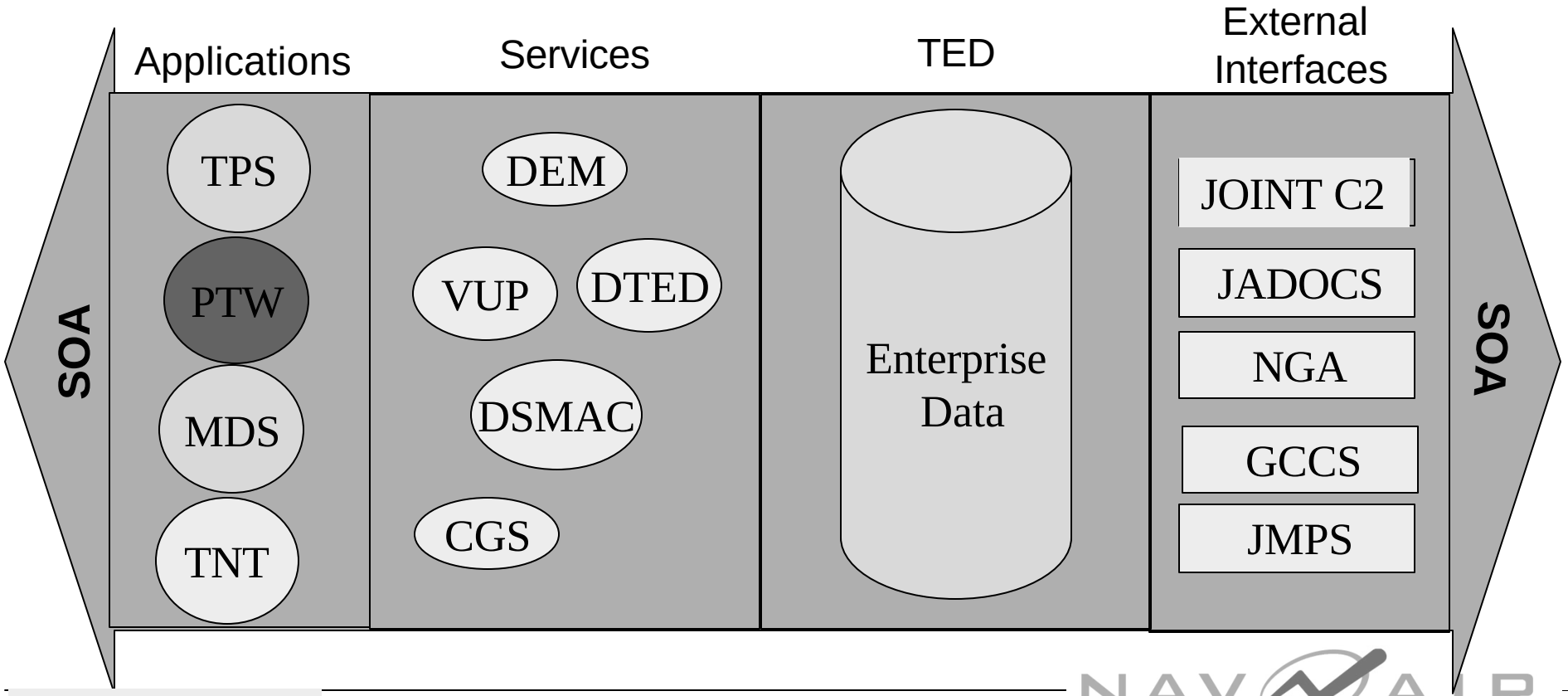
WAS



IS
(TC2S 4.0.7)

SOA Challenge

- Phase 2: Focus on the Functionality
  - Use Net-enabled web-services to provide commonly performed functions (like auto-creation of Digital Elevation Matrices)
  - Introduce PC-based tools for targeting and imagery-based products



Yellow=Way Ahead

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Integrated Strike Planning & Execution

CVN-21

+

CVW "2020"

- (2) F/A-18 E/F
- (2) JSF
- (1) E/A-18G
- (1) E-2C
- (var) MH-60 S/R
- (1) J-UCAS

Key Performance Parameters (KPPs)

- **Manpower Reductions**
- **Net Ready**
- **Survivability**
- **Force Protection**
- **Sortie Generation Rate (SGR)**
  (Surge / Sustain)
  Threshold 270 / 160
  Objective 310 / 220

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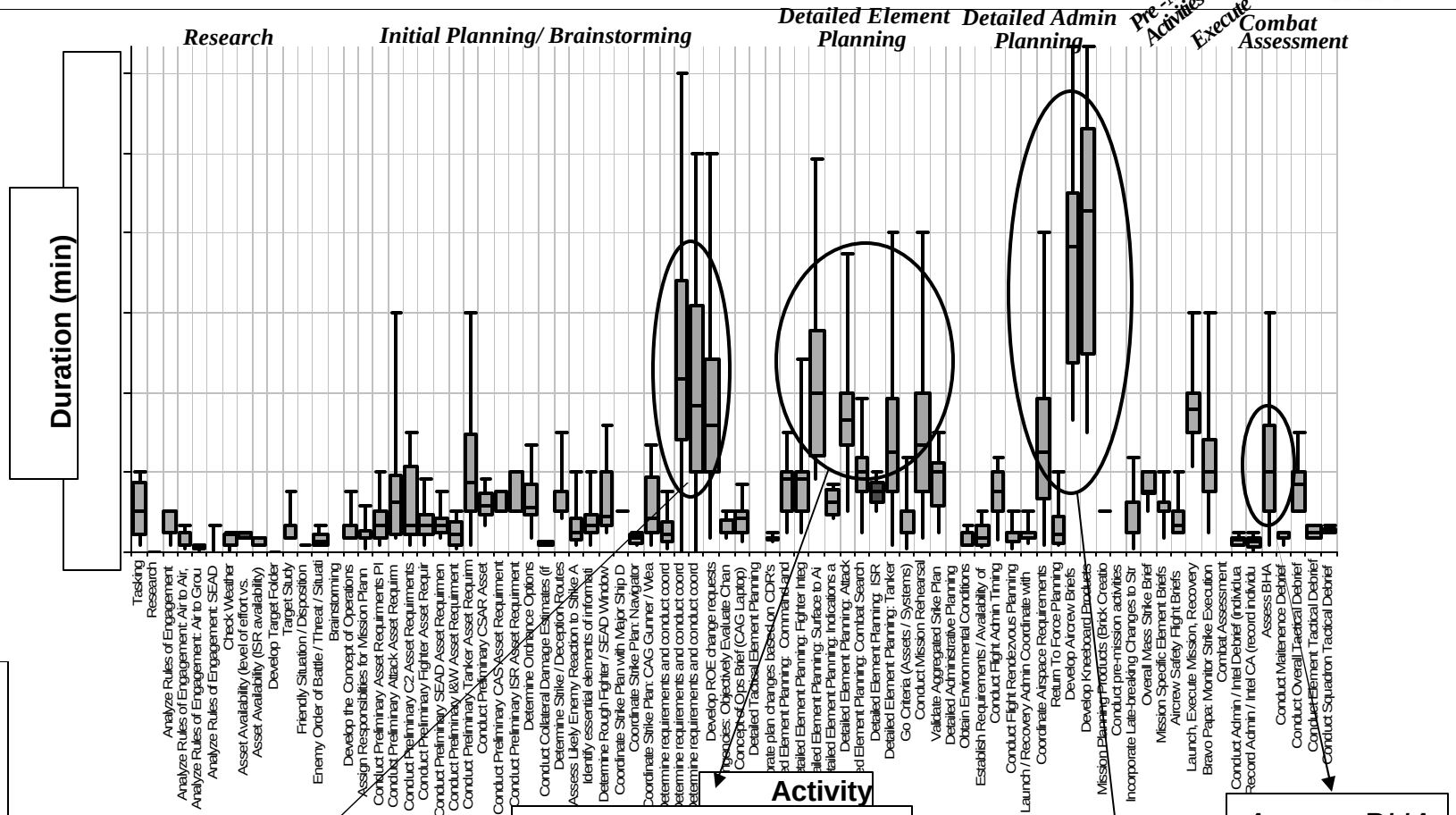
Requirement Drivers

- CVN-21 Throughput and Manning
  - Sortie generation rate
  - Aimpoints “serviced”
  - Automation...
- Time Sensitive Targets
  - Use “pre-planned” processes for TST
- Network-Centric Operations
  - Data visibility
  - Use of Distributed Services
  - Updated system architecture...

Strike Planning - The "Long Poles"



Maximum

75% Data

50% Data

25% Data

Minimum

Coordinate with Partners
Coordinate with ISR
ROE/Guidance changes

Detailed SEAD
Detailed Attack
Detailed CSAR
Detailed tanker
Mission rehearsal
Validate strike plan

Coord airspace reqts
Aircrew briefs

Future Vision