COTS FRESH LOOK: USE IN MAJOR WEAPON SYSTEMS' ACQUISITION

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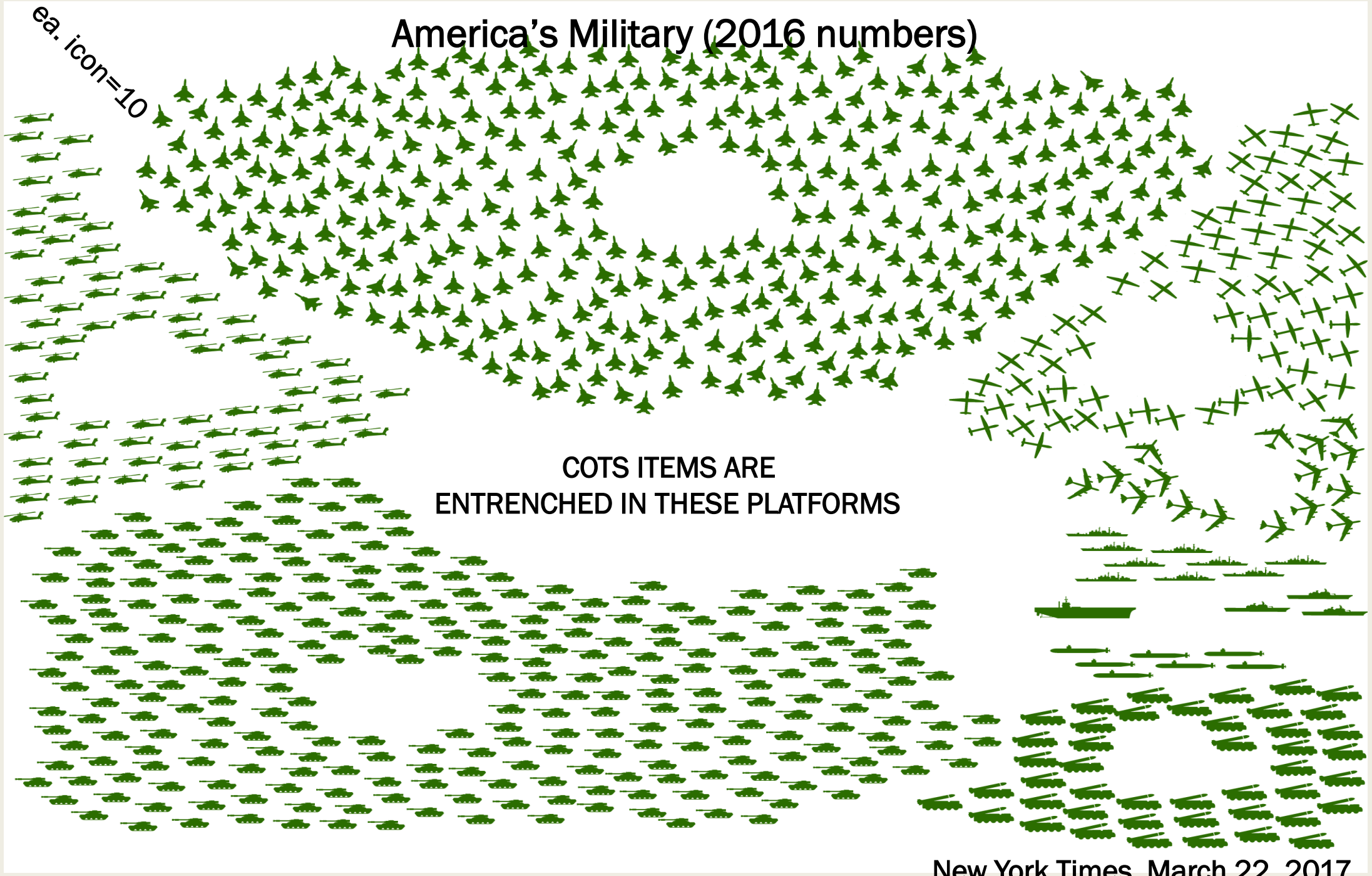
Background & Scope

- Academic paper is part of a technical report on COTS use in defense acquisition as a catalyst for **improving cycle time* for major programs.** That technical report will flesh out findings and recommendations in this academic paper.
  - *Ongoing Research Methodology*
    - Content Analysis (Krippendorff (1980), Weber (1990), Babbie (1992)
    - Normative and Impact Question Analysis (Runkell and McGrath (1972), Judd and Kidder (1986)
    - Identify and collect quantitative data that may be available at two DoD Organizations

- Limitations:
  - *Does not address routine commercial items (e.g. computers)*
  - *Research to date indicates a lack of rich metrics on COTS use in major defense programs vis a vis schedule impact*
  - *Commercial items are entrenched in major defense systems and integrated with other (e.g. Government developed software) systems thus frustrating single point of failure conclusions.*
  - *Dynamic field of study*

* Cycle time is defined as time between identification and fielding of a need (USD AT&L, 2015)


America's Military (2016 numbers)
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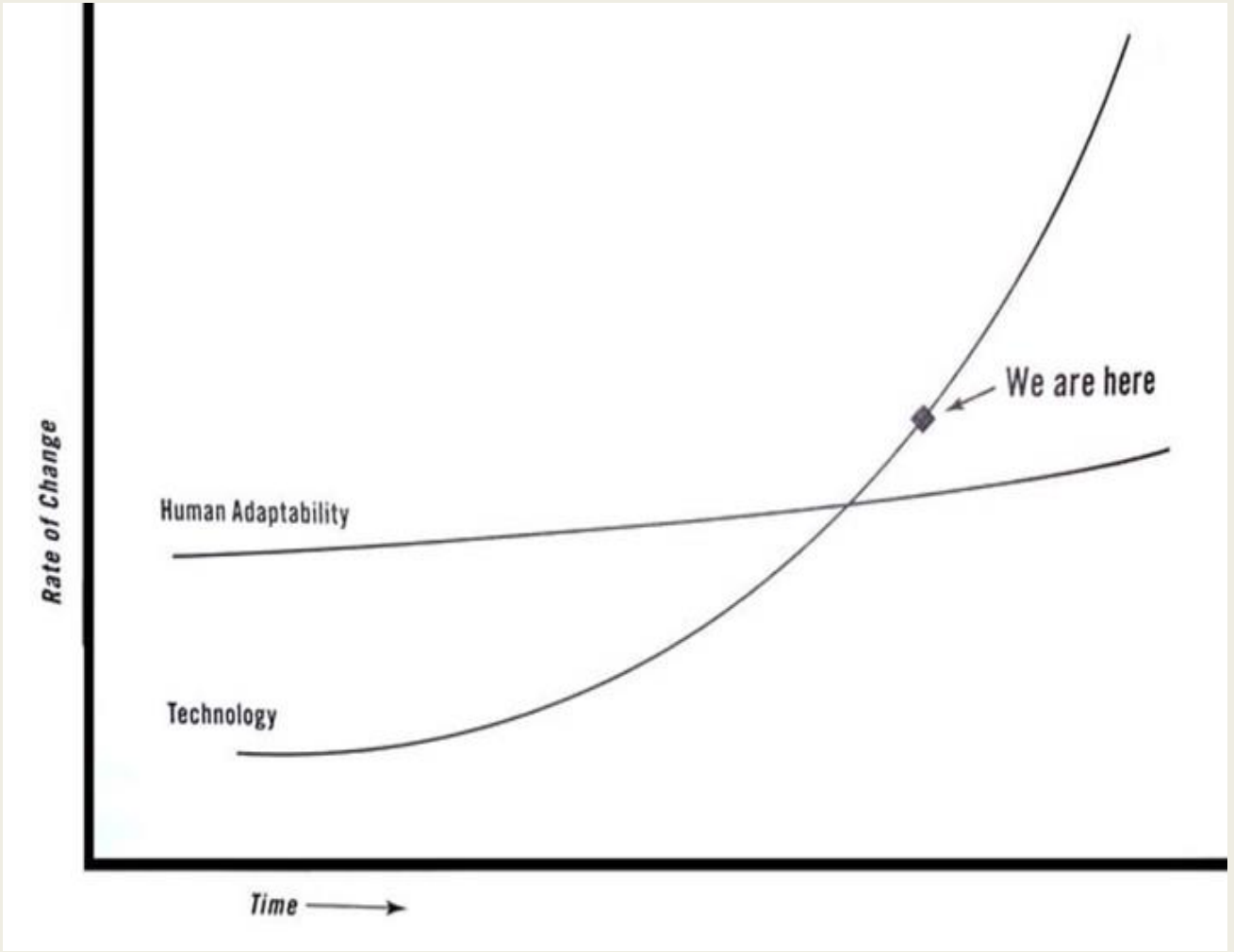
COTS ITEMS ARE
ENTRENCHED IN THESE PLATFORMS
New York Times, March 22, 2017

Data Collection

- Sources:
  - *Secondary data*
    - GAO, PARCA, DoD Policy Memoranda, News/Press Releases, Technical Reports, Academic Literature
  - *Discussions with Organizational Representatives*
    - TARDEC, Warren Michigan
    - NAVAIRSYSCOM, Software Safety Office, Patuxent River MD
    - SSC Pacific, San Diego, CA
  - *Future Planned Discussions with DoD Organizations*
    - TACOM, Warren Michigan
    - NAVAIRSYSCOM JSF Program Office

A Significant Challenge

Technology v Human Adaptability

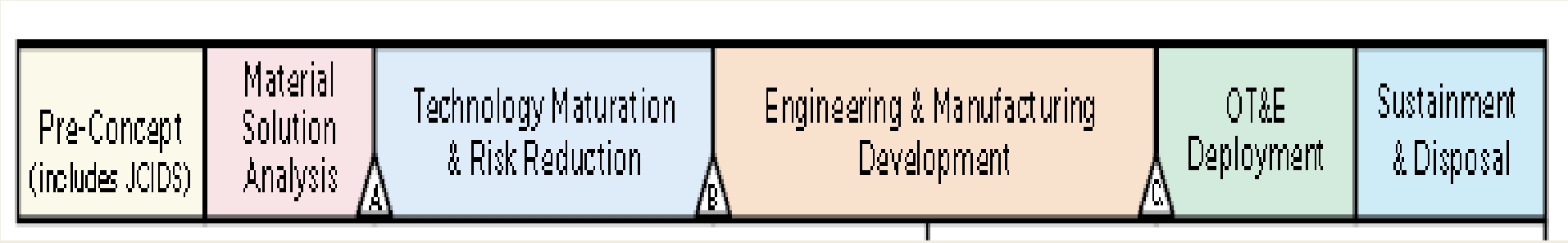


Technology won't slow down for us.

Friedman, 2016

Existing Defense Acquisition System

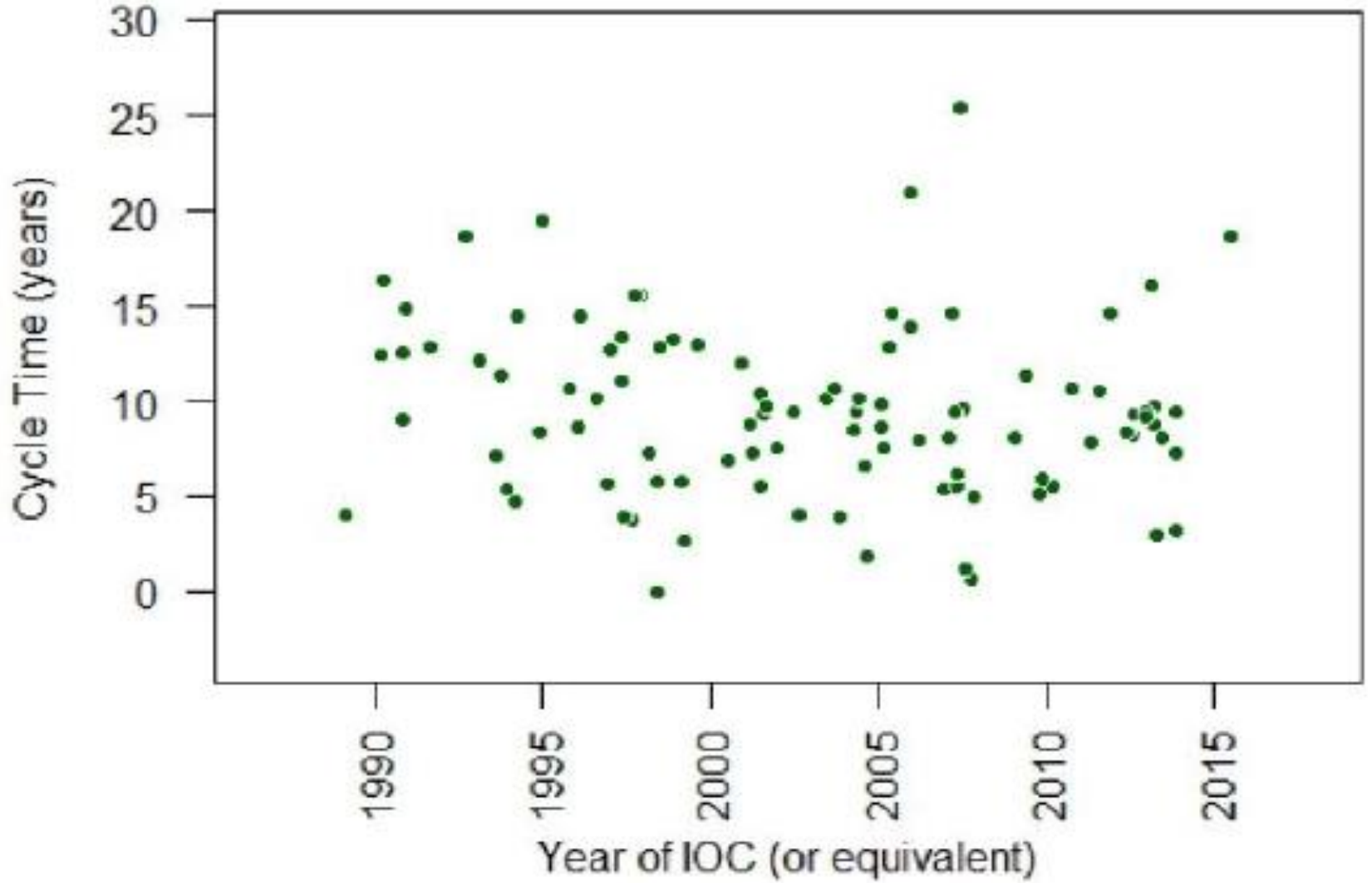
(Generic)



How long does the time to Deployment take? 3 years? 5 years, 7 years, 10 years, 15 years???

A yawning gap between commercial tech cycle and defense acquisition cycle frustrates improved time to market

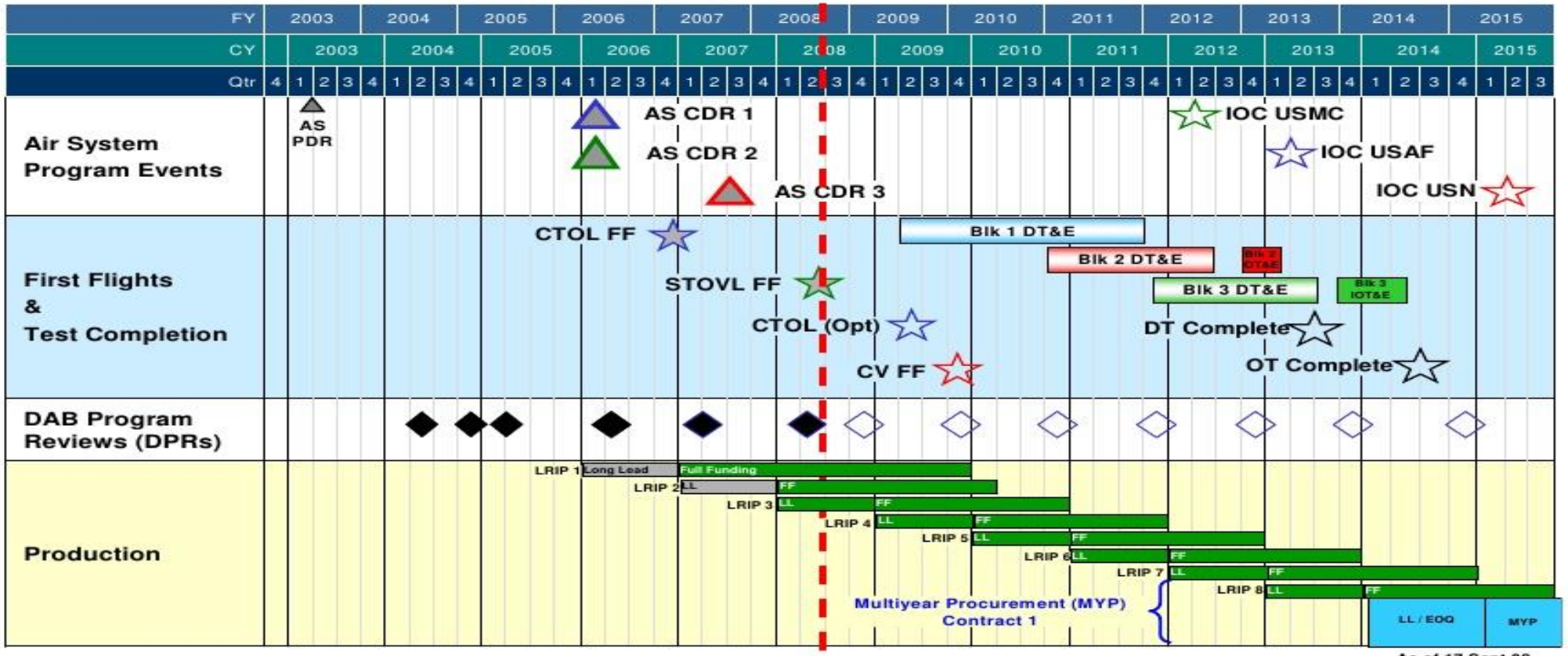
Figure 4. MDAP Cycle Time by Year



Source: (Tate, 2016)

Example: 2008 Planned JSF Program Schedule

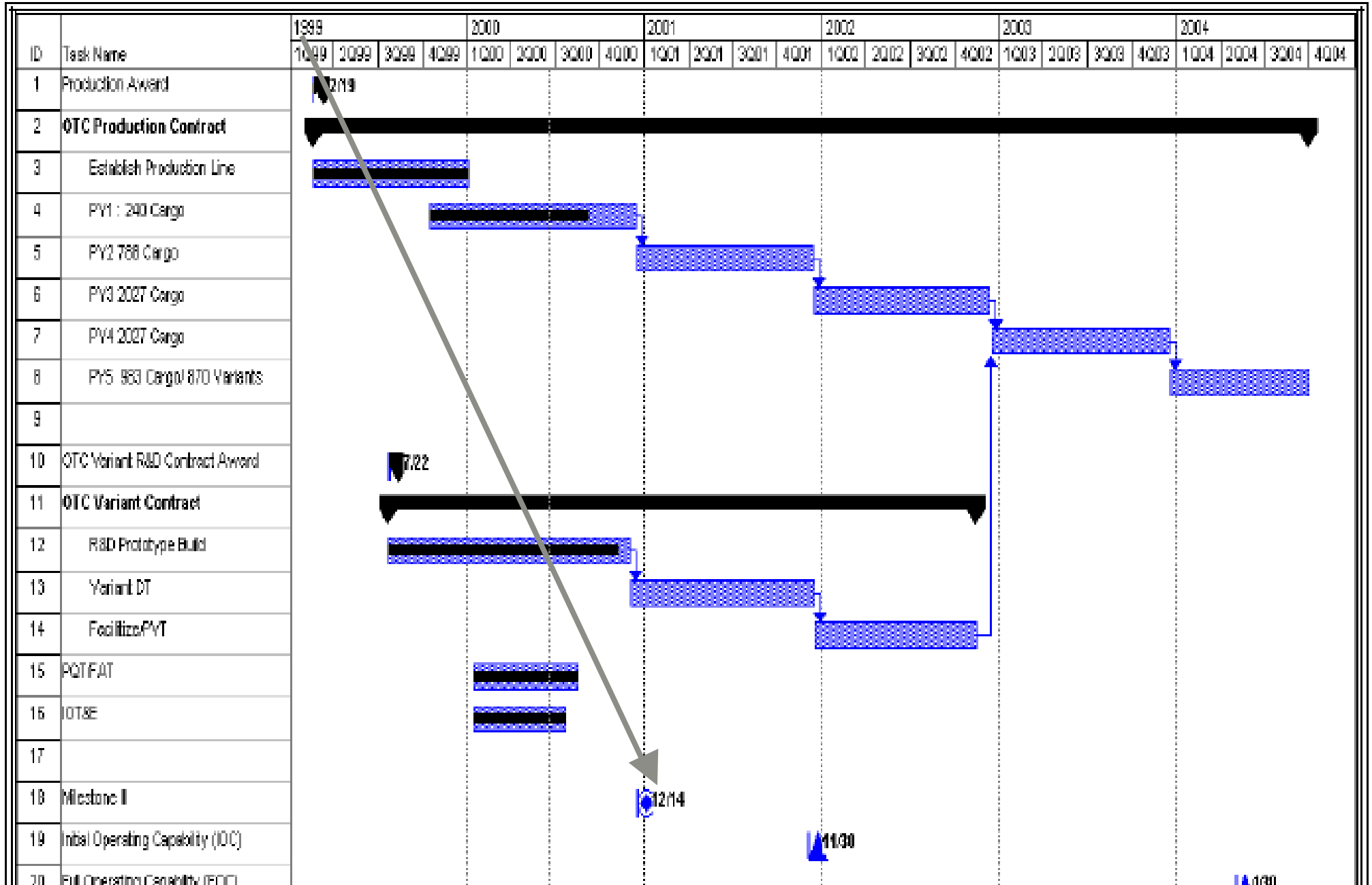
JSF Top-Level SDD Program Schedule



Examples: COTS use as a contributor to improved cycle time for JSF

- Avionics: Use of middleware reduces time to upgrade and add incremental capability.
- C++ Programming: enables faster code development.
- COTS Architecture permits technology upgrade from projection technology to LCD technology.

Example: Medium Tactical Vehicle Replacement Program



Example: T6-A : Design meets COTS Criteria

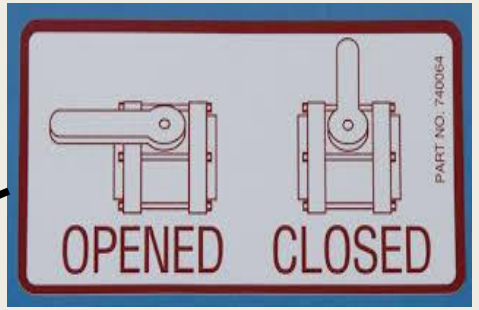
Initial Decision: COTS Item

Ongoing design changes and delayed decision regarding NDI Determination caused schedule slip.

Deliveries of IOC fell behind by Average of 1 aircraft per month

Some Major Findings

- Pace of technology v pace of defense acquisition system.
- Need for firm requirements drives the current process.
- Some frustrated activities: planning, capability, requirements, sourcing, testing, reviews.
- Inherent subjectivity in some activities within the cycle.
- Reaching non traditional defense contractors who may have interesting commercial ideas and solutions.
  - *Supply-push; demand-pull; Open Valve*
- Internal expertise to discern levels of risk.
- % of commercial subcontracts is significant: why is this important?



Preliminary Conclusions

- There is no direct evidence that use of COTS in major weapon systems reduces cycle time.
- While COTS insertion may improve an activity, the overall cycle time is impacted by many variables (e.g. program management events, funding, pace of technology)
- The use of COTS as a major weapon system does improve cycle.
  - *Examples: MTVR, ZH-2*

A Few Recommendations
Strategic Rethink of Existing Framework

- Bolster and Retool: we will always be playing “catch up” unless we adapt our existing defense acquisition framework.
- A new model of defense acquisition process can accommodate the fluidity of the commercial marketplace.
  - *Reviews, approvals, waivers-revisit and rethink*
- Single and open valve point of entry for providing commercial capability and solution information.
- Enhanced metrics to further study cycle time-”baskets of information” segregated by COTS/complexity.

Not just real time.
Ahead of time.

A Few of the More Significant Recommendations

- Develop and pilot a new defense acquisition model that accepts the fluidity of the commercial marketplace.
- Create a market driven portal as a commercial capability and solutions' repository of information.
- Further streamline prime commerciality determinations through a stand alone Commercial 'CPSR."
- Integration and TRLs must be viewed as holistic at knowledge points.
- Identify candidate points in the process that could be converted from "waiver" to "intent to proceed".

Planned Future Work: COTS

- Further collection and analysis of data on COTS programmatic and administrative processes/efforts that impede and facilitate COTS in major system acquisition. Examples:
  - ***Review/Approval time*** *impediments and alternative approaches*
  - *Examine iterative* **capability assessments** *that could accommodate the dynamic pace of COTS*
  - *Time driven* **information access**
  - **Integration**
  - **Fielding and OT&E** *frameworks*
- Methodology:
  - *Content analysis (framing elements of academic paper)*
  - *Available quantitative input from 2 DoD organizations (per Terms of Reference)*
  - *Normative and impact assessments*
- Examples: Source of data collection
  - *GAO Reports, PARCA Reports and CRS Reports*
  - *US Army Tactical Wheeled Program*
  - *NAVAIRSYSCOM Software Safety Office, Patuxent River MD*
- End Goal: Conclusions and recommendations for improving time to market for COTS enabled programs