Transitioning Research Concepts to the Command and Control Community Quickly

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Basic Rule of Human Behavior

"All Sales/Purchase decisions are EMOTIONAL!"

"Facts and figures are later used to rationalize an emotional decision previously arrived at"

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Basics of SBIR Program

Grant program for small businesses to develop commercial products to sell back to the government and to the general public

- Phase I - $100K fixed price grant for feasibility study
- Phase II - $750K prototype development
- Phase II+ - funds from other sources (usually matched by SBIR)
- Phase III – commercialization. Company productizes and sells product publicly. SBIR program funding ends
- Company retains intellectual property rights to product
- Government must refrain from distribution for 5 years (but retains government use rights)

Government essentially acting like a Venture Capitalist

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Benefits of COTS Model

Investors - spending money out of their own pockets. Won't waste money on ideas which they don't think will make a return.

Entrepreneurs - accountable to investors. Vast wealth for entrepreneur if product is successful. Strong motivation to succeed.

Customers - Purchase decisions are "apolitical". Spending own money on best product. Collective marketplace determines winner

Government Regulators - Don't need to interfere with the will of free market in determining winner.

Survival of the Fittest - Bad products die fast! Minimal drain on society to keep inferior products and companies around. Best ideas win and are rewarded. Multiple differentiated products can win.

Price Pressure - If one product is making too much profit, competitors will enter the market and drive prices down.

Normal US DoD Business Model

Gov't pays Procurement Agency to develop single over-specified "annointed" product (OneSAF, JSIMS, etc.)

Contract with hourly contractor to develop software

Give away product for free to end users (source and executables)

Pay long-term maintenance to contractor

Start the whole process over again every 10 years

"Serial Monopoly" model resembles Soviet centralized economy model

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Problems with Hourly Model

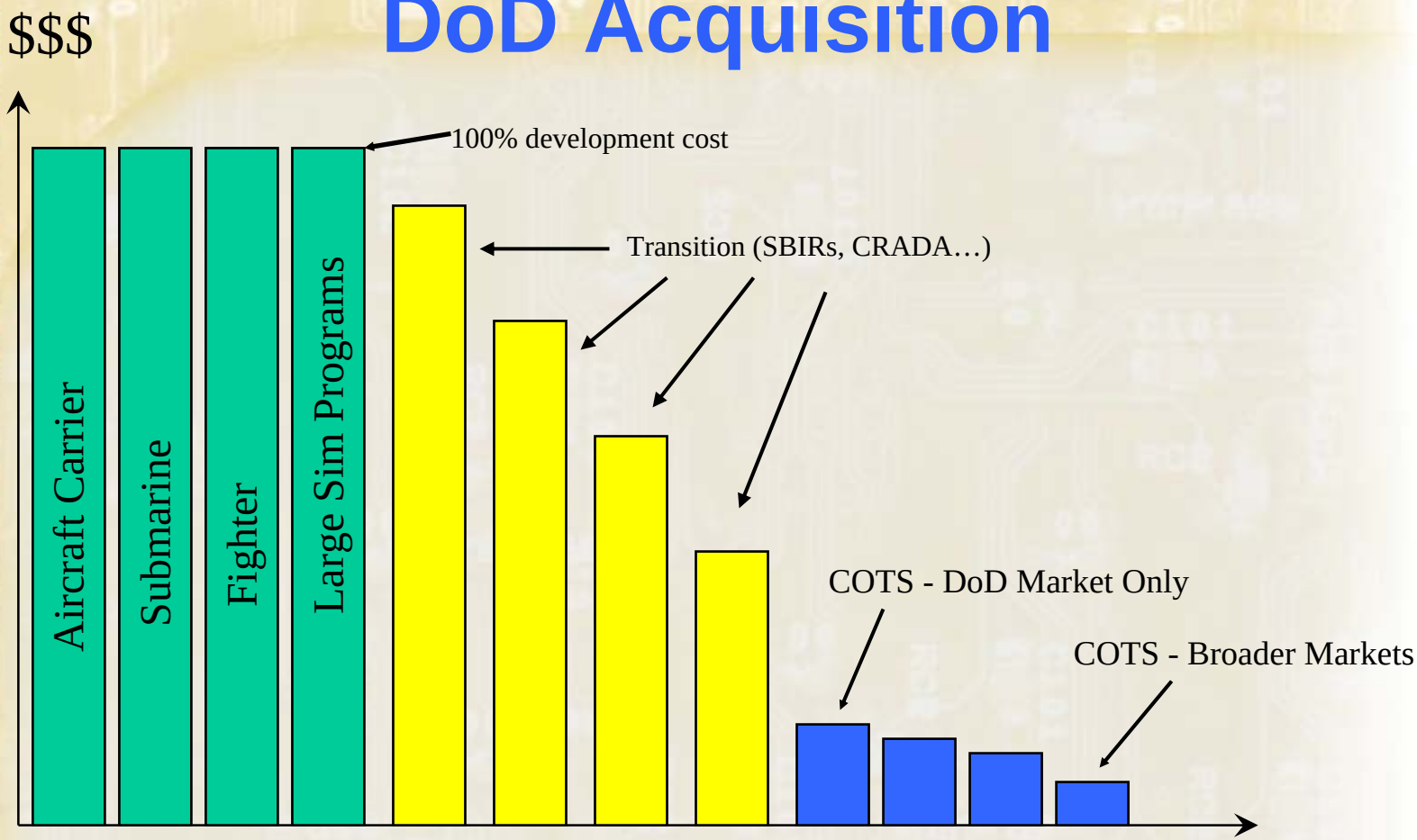
Customers - Little influence over features, quality. Product may be inexpensive to end user, but the wait is often years, quality poor, and follow-on support non-existent. End user has no leverage

DoD - Purported fair competition in proposal effort, however, 0% of proposals reflect actual end product or development cost.

Contractors - Bad product can live forever. No incentive to innovate, take risk, or improve products. Customer is Program Manager, not end-user. Financially incentivized to maximize cost. Emotionally prefer to remake instead of reusing!

No competition - Leaves no choices for consumers. No price pressure, no pressure to innovate, the weak survive forever. Actual cost of GOTS shielded from competition. Better products that cost money are frozen out of market.

Ideal Commercialization Path for DoD Acquisition



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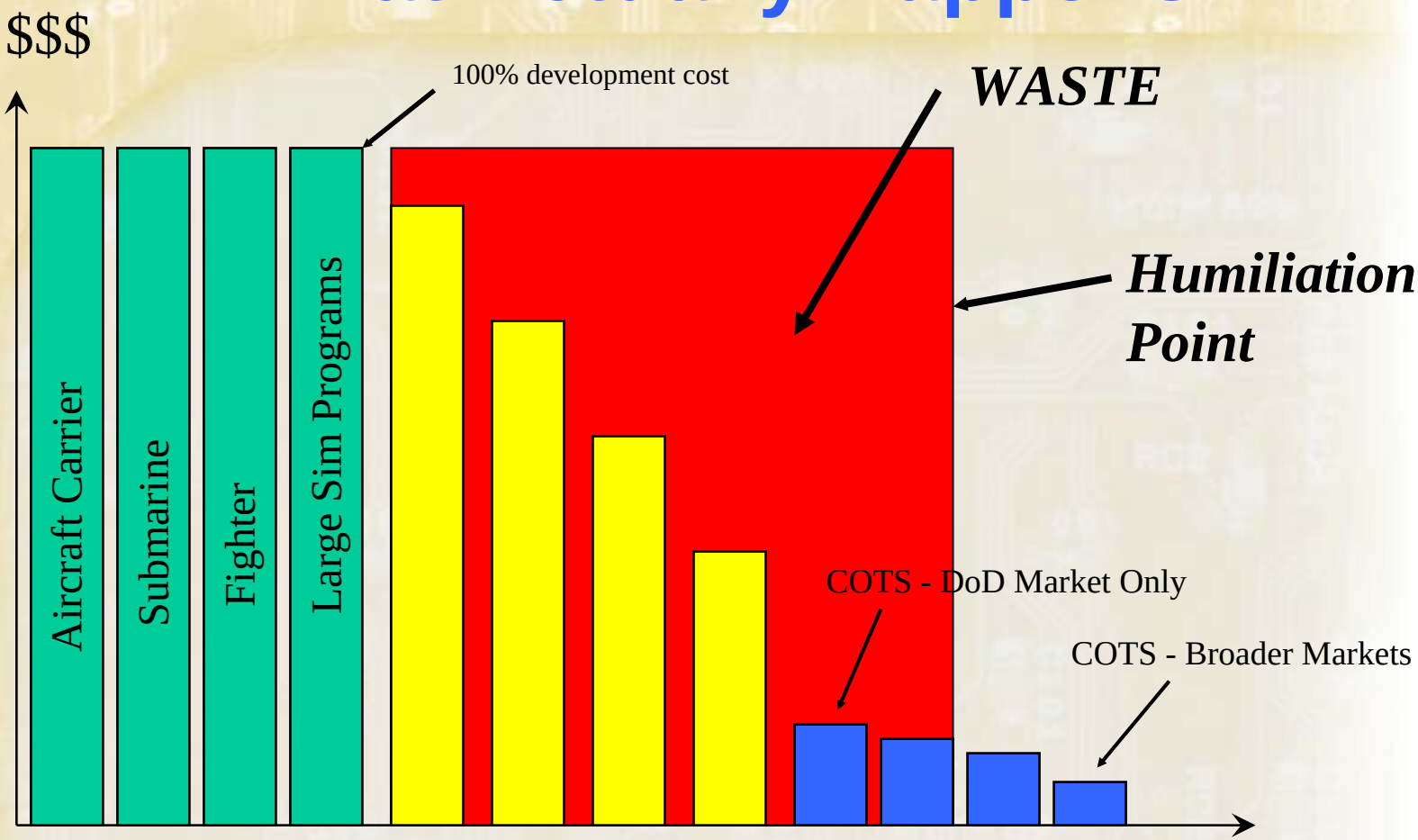
What Actually Happens



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Other Regulations Requiring COTS

- Clinger-Cohen Act
- Office of Management & Budget Memorandum of October 25, 1996 ("Raines Rules")
- DoD Directive 5000.1
- DoD Regulation 5000.2 (5000.2-R)
- DoD Joint Technical Architecture (version 1.0)[1]
- Defense Information Infrastructure (DII) Common Operating Environment (COE) (baseline version 3.1)

Open Standards Critical

No Gatekeeper – No single vendor or Program can force a market to pay it a tax for access to an interface

Consensus Process – Naturally slower, but product reflects the diverse needs of the whole market. No one organization has more control than any other

Low Barrier to Enter – Open standards create markets and aids vendors in making plug-compatible products

Low Barrier to Exit – End user can easily switch from old obsolete products to new technologies, less expensive replacements

Open Systems enable free market competition to drive quality up and prices down

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OMB – A119

*"**Voluntary consensus standards**"* are standards developed or adopted by voluntary consensus standards bodies…

"***Voluntary consensus standards bodies***" :

- Openness.
- Balance of interest.
- Due process.
- An appeals process.
- Consensus.

"All federal agencies must use voluntary consensus standards…"

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Market Incumbents Don't Like Open Systems!

Long Term Lock-In – Large defense contractors don't want ongoing head-to-head competition! Would rather win a decade-long contract, sit back and relax without fear of displacement

Prefer Contract Model to Commercial Model – In the real world, vendors invest in their own products and must succeed. Vendor pays for its own failures out of profits. In DoD, vast bulk of development is CPFF. Government pays for all losers, contractors MAKE profit off of losers. No risk for contractor

Open Systems enable upstarts to displace incumbents
Incumbents like the old system

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Therefore, They Cheat!

Need to *Appear* to Salute Open Systems Flag – Vast bulk of regulations (OMB-A119, DoD 5000…) require Open Systems approach. Contractors must APPEAR to be complying with regulations

While Covertly Retaining Control – Using clever interpretations of definitions of "Open System", delayed processes that continue closed control, etc.

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Common Tactics to Cheat

"The Blob" - My particular implementation is an "open standard" because I've published the APIs.

"We'll get to the "Open" part later" - but we'll start requiring its use now.

"Puppet Master" - Apparently open process, but with a Czar or Kabbal that has back-room control.

"Not-So-Open Source" – Give out source code under restricted conditions and confuse terminology with Open Standard

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Bottom Line Problems

Motivations are in the wrong direction:

- Cost Plus Fixed Fee contractors rewarded for duplication – look for any excuse to replicate
- Government Program Managers not rewarded for reducing the cost or schedule of their programs
- Government Program Managers not rewarded for pushing technologies out of government into the commercial market
- Government engineers viewed as “free” resources, therefore their work product is viewed as free

Solutions are Very Hard Cultural Changes

- Firm Fixed Price for large systems
- Reward PMs on *reduction* of program budgets or schedule
- Reward PMs for pushing technologies into the commercial market
- Truthfully account for the cost of government employees developing “free” product
- Institute attitude of disdain, and punitive measures for government programs that duplicate COTS

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Excellent Progress to Date

- New DoD 5000 series of regulations requires use of SBA to prove concepts before funding
- JSIMS Analysis of Alternatives business game resulted in new open market model for M&S (being adopted in several places)
- Maximum COTS use required in most RFPs
- Many large M&S procurements switching over to firm fixed price or PFI
- Common Joint Mapping Toolkit (CJMTK) core of all C4I systems is COTS (ESRI)
- Still a long way to go to change local incentives

SBIR Program is a shining example of how to do it!

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