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17.462 Innovation in Military Organizations
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MISSILES, BALLISTIC AND CRUISE

Ballistic Missiles in the US were the product of both Civilian Intervention and Inter-service Competition. Civilian officials made it clear that we would have ballistic missiles in the arsenal and soon, but they wanted to have the Air Force in charge. The Navy (and the Army) feared for their futures and pushed alternatives---the result was the right answer POLARIS.

But innovation is more than technology and more weapon systems. It can also be organizational.

Civilian example:

- Supermarkets—central buying, self-service, many goods, parking.
- Credit Cards----national financing, plastic, and a fee per transaction
- FedEx-----Airplanes, hubs, law firms, and a weak postal system.

I think we won the Cold War in part because we found a way to make military side of government technologically competent and conflict of interest free. We innovated organizational—created a new form—Non-profits dedicated to helping the military manage technology.

FFRDCs Federally Funded Research and Development Centers and similar organizations----DOD had as many as 70

Several types:

- Research—Lincoln
- Policy---RAND, ANSWER, CNA, IDA
- Systems Engineering---Aerospace Corps, MITRE, APL

WWII was a production war, but we often remember it as Churchill called it –The Wizard War (TEST).

US ---Aircraft and the A Bomb

Germans---Missiles and Submarines –we need to catch up.

Military not interested in Science---it wants technology

Arsenals traditional way military develops and manages military relevant technologies between wars.

- But no (limited) arsenals for the Bomb, aircraft, missiles and submarines
- But military needs to advance these technologies in arms race with USSR.
- And military distrusts the arsenals and government laboratories (unions, refuge for people afraid of markets, hard to control)

How to achieve TECHNOLOGICALLY COMPETENT GOVERNMENT?

US civil service weak compared to rest of industrial world

Elite services; government careers highly valued; strong central governments – CALL TO ROME

Military: Never going to be real engineers; technical subordinate to combat arms. Careers too short and varied.

Industry: Very responsive and can attract good engineers with better pay, but develop conflicts of interest.

University Scientists: Great science, great technology but prefer basic to development and want autonomy----or more; control of decisions: a place at the top table: their way or the newspapers.

FFRDCs solve the problem. Competence; loyalty to mission; dependant.

DEW Line----IBM, GE, MIT ---→ MITRE

AF Missiles----North American plus others, Ramo & Woolrich --→ Thompson
Ramo Woolrich--→ TRW---→ Aerospace Corp

Navy FBM-----Chrysler--→ Lockheed---→ APL, Draper

Fighting Soviets and Fighting Each Other

Douglas --→ RAND--→CNA----→ ANSWER--→ IDA--→ LMI

Now Jointness leads Navy to use RAND to fight OSD and parts of Navy

Why not many and very effective FFRDCs for civil Government and why are more established entities not the answer for DOD and the military?

- Health ---Alpha Center but FDA and CDC are government and most of health tied to basic research and the university medical centers

- National Academies -----not scientific but political in many of its studies
- Defense Science Board-----no scientists

POST-COLD WAR BLUES

- Industry wants job----SAIC and the retired colonels
- FFRDCs become less challenged, lazy, expensive
- Lead Systems Integrators and the need for skeptical flag officers; managing POLARIS and competent government
- And Some are aborted---Senator Levin and SDI

SDI, FFRDCs, Politics, Arms Control, and the "MIT" Poet Study

a sad and sorry tale indeed