



Strengthening
University-Industry
Partnerships



DARPA Strategic Technology

October 21, 2020 1-1:45 PM EDT



Tony Boccanfuso
UIDP



Timothy Grayson
DARPA

DARPA's Innovation Model

Timothy P. Grayson, Ph.D.
Director, Strategic Technology Office

UIDP Triple Helix Days

21 October 2020





Prevent and impose technological surprise

CULTURE

- Mission-focused
- Risk tolerant
- Honor in public service

PEOPLE

- Exceptional technologists
- Limited tenure
- Autonomy

PROCESSES

- No in-house labs
- Metrics-based
- Programs have end-dates

Facts and Figures

~\$3.5B annual budget

~100 program managers

All work is extramural

Lean overhead: ~5%



CULTURE: DARPA's beginnings

"All the News That's Fitto Print"

The New York Times

LATE CITY EDITION
U. S. Weather Bureau Report (Page 2) Forecast: Cloudy and cool today and tonight. Mostly fair tomorrow.
Temp. range: 65-70; Yesterday: 62.4-69.2.

VOL. CVII., No. 36,414. NEW YORK, SATURDAY, OCTOBER 5, 1957. FIVE CENTS

© 1957 by The New York Times Company. Printed in the U.S.A.

100 Normal 10-point type from New York City

October 4, 1957
Russians beat U.S. to space with Sputnik satellite; U.S. should never again be surprised by technology.

February 7, 1958
NUMBER 5105.15

Department of Defense Directive

SUBJECT: Department of Defense Advanced Research Projects Agency

I. PURPOSE
The purpose of this directive is to provide within the Department of Defense an agency for the direction and performance of certain advanced research and development projects.

II. RESPONSIBILITY AND AUTHORITY

A. Establishment
In accordance with the provisions of the National Security Act of 1947, as amended, and Reorganization Plan No. 6 of 1953, there is established in the Office of the Secretary of Defense the Department of Defense Advanced Research Projects Agency. The agency will be under the direction of the Director of Advanced Research Projects.

B. Responsibility
The Agency shall be responsible for the direction or performance of such advanced projects in the field of research and development as the Secretary of Defense shall, from time to time, designate by individual project or by category.

C. Authority
Subject to the direction and control of the Director:

1. The Agency is authorized to direct such research and development projects being performed within the Department of Defense as the Secretary of Defense may designate.
2. The Agency is authorized to arrange for the performance of research and development work by other agencies of Government, including the military departments, as may be necessary to accomplish its mission in relation to projects assigned.

February 7, 1958
"The purpose of this directive is to provide within the Department of Defense an agency for the direction and performance of certain advanced research and development projects."

Go to YouTube and search:
DARPA's 60 Years of Challenges and Breakthroughs



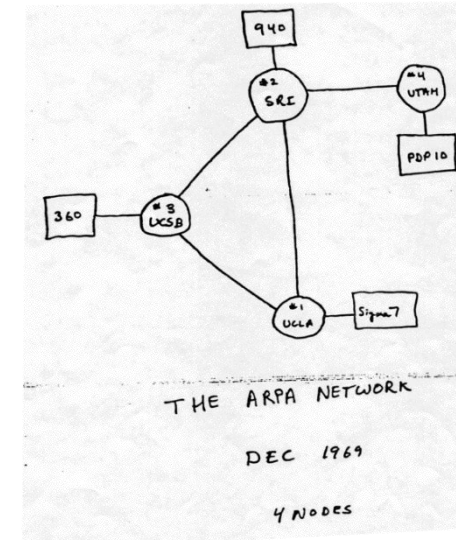
MISSION-CENTERED

This origin has led to a mission-centered research and innovation model...

Stealth aircraft



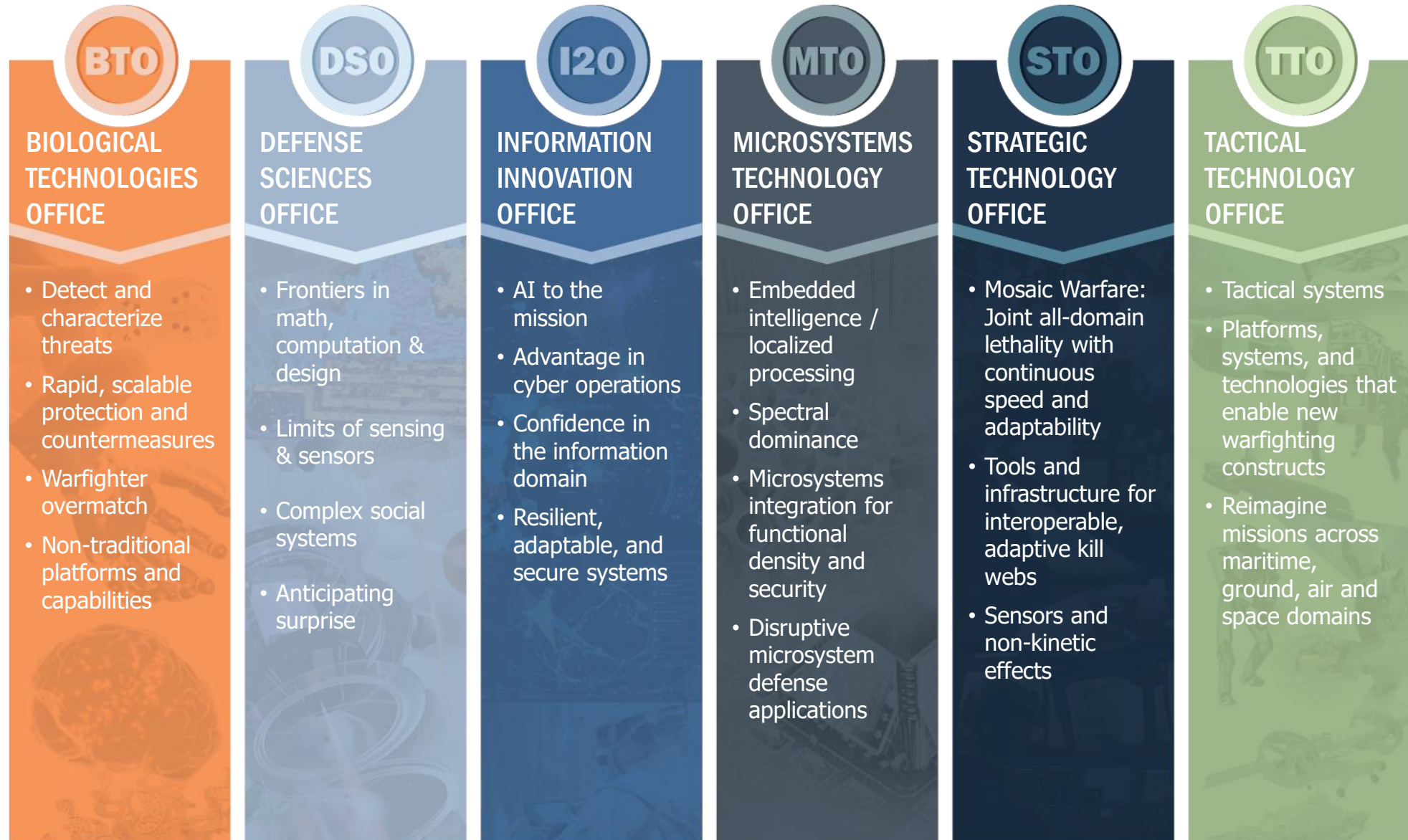
The Internet



How can we remove the technology excuses to solve critical problems in new ways?



DARPA technical offices





PEOPLE: The DARPA business model...

...It's all about people

Lean, flat organization

No infrastructure

All work is extramural



All technical staff (agency and office leadership, program managers) are on term appointments

- 2 – 6+ years, typical ~4

Novel (for government) industrial-like hiring authority

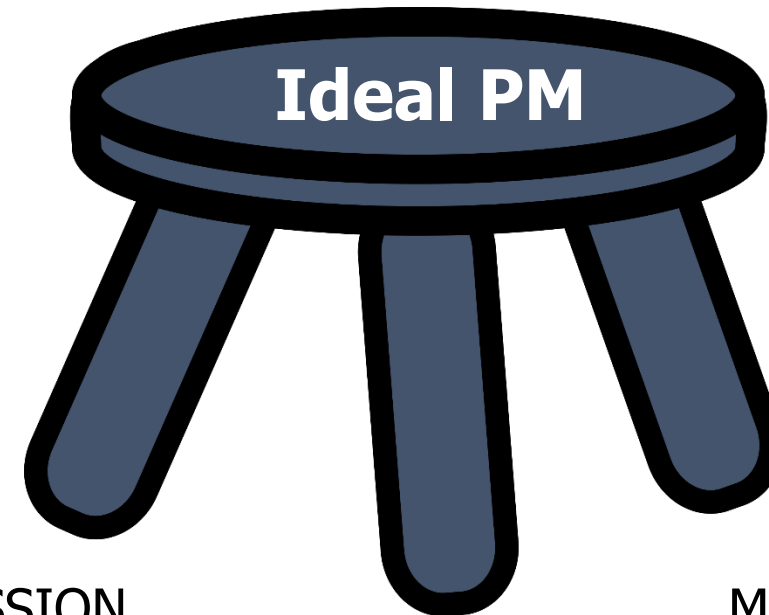
- Fast
- Salary flexibility

All PMs are successful, hired mid-career

- No/limited human capital development

PMs are hired for their ideas,
motivated to run fast,
and are replaced with the skills needed at
that moment in time

No empires or retirement in place!



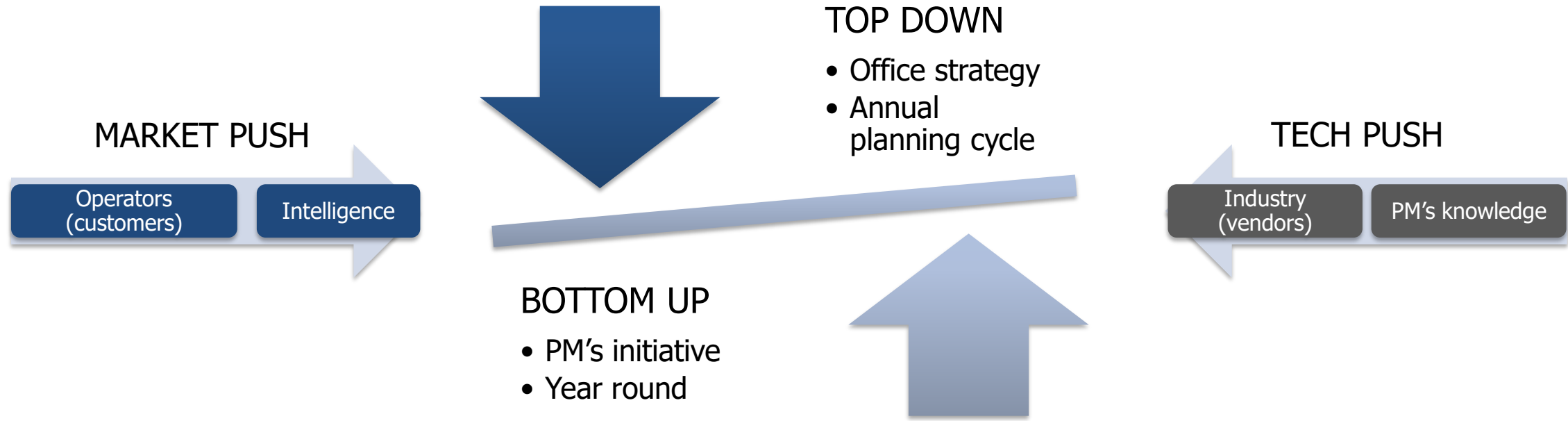
MISSION KNOWLEDGE
Identify problems
Find partners

TECHNICAL DEEP
Define programs
Oversee performers

MANAGEMENT SKILLS
Execution
Communications



PROCESS: Creating the research portfolio



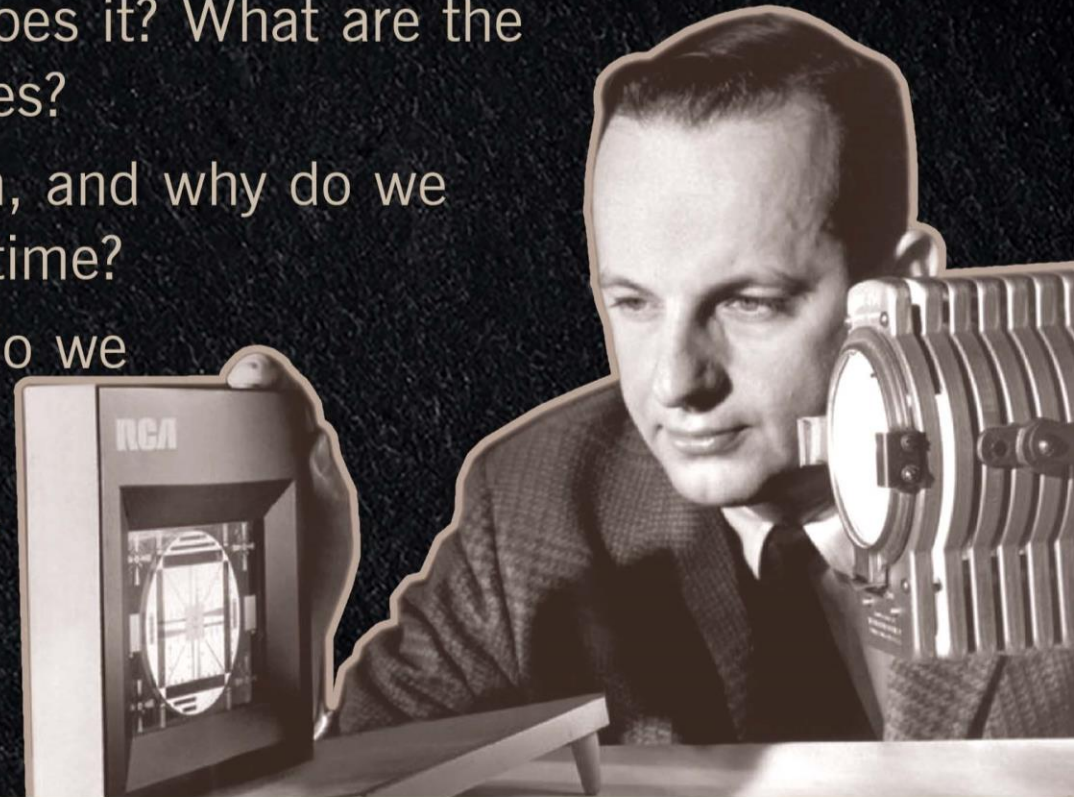
Accept *risk*... intelligently

- Identify the risks
- Model for what needs to be achieved to mitigate risks
- Rationale mitigation might work
- Means of testing that mitigation works – early!



The Heilmeier Catechism

1. What are we trying to do?
2. How is it done today and who does it? What are the limitations of the present approaches?
3. What is new about our approach, and why do we think we can be successful at this time?
4. If we succeed, what difference do we think it will make?
5. How long do we think it will take, and what are our mid-term and final exams? How much will it cost?



George Heilmeier
DARPA Director 1975-1977



Non-traditional public/private business models

New types of services businesses (cf. "Geek Squad", DevSecOps)

- Technically-empowered IT services

Commercially-inspired marketplace style acquisition

- Private CAPEX vs. cost-reimbursable

Engaging with commercial companies and partnering with the venture community

- Product development with non-dilutive revenue



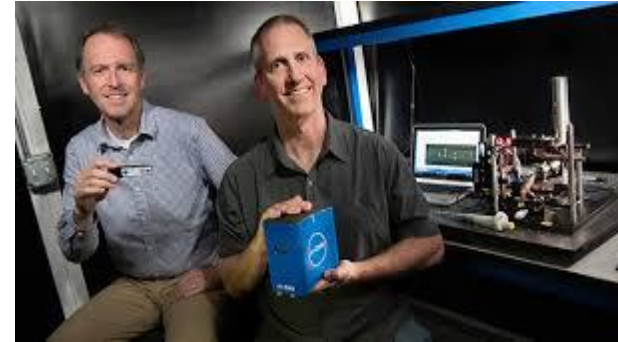


DARPA Embedded Entrepreneurship Initiative

Decrease the time from invention to military capability

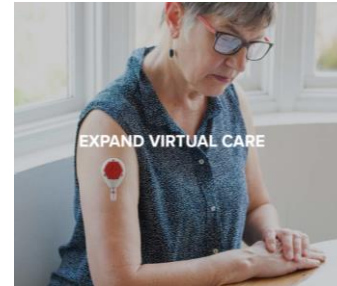
Step 1. Embedded Entrepreneur

- Augment technical team with seasoned entrepreneur
- \$250k/Performer for 1-2 years
- Goal: Robust go-to-market strategy for defense and commercial markets, attract U.S. investors



Step 2. DARPA Investor Working Group (IWG)

- 30 top-tier, U.S. investors provide 1-on-1 mentoring. Represent over \$29B assets under management
- Currently vetting 65 additional investor requests to join



★ Promising Results from Pilot (2 years, 20 current Performers)

- \$74.2M in U.S. venture capital raised
- \$0 foreign investment
- 9 Seed and Series A rounds closed, 2 Series B rounds closed
- 7 joint development agreements and 2 licensing deals with corporate partners
- 8 companies generating early revenue
- 6 new manufacturing facilities stood up





Young Faculty Award (YFA) Program

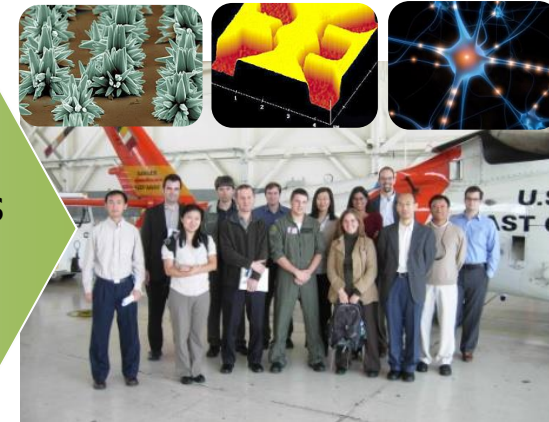
The objective of the DARPA Young Faculty Award (YFA) program is to identify and engage **rising stars** in junior research positions, emphasizing those without prior DARPA funding, and expose them to DoD needs and DARPA's program development process

The YFA program provides:

- Research funding
- DoD contacts
- Military visits/exercises
- PM Mentor

The YFA program yields:

- Insight into DoD problems
- Novel ideas
- Career development
- Future DARPA performers



- Proposers must be one of the following (excluding any personal leaves of absence):
 - current Tenure-Track Assistant/Associate Professors;
 - current Tenured faculty within 3 years of their Tenure date; or
 - an equivalent at a non-profit research institution within 12 years of the receipt of their Ph.D.
- All proposers must be employed at a U.S. Institution.
- Previous YFA Award recipients are not eligible for this or any future YFA program.
- Former DARPA Program Managers are not eligible to apply for funding under this program.
- Researchers working at Federally Funded Research and Development Centers and DoD and other Government Laboratories are not eligible to apply for funding under this program.

Direct ALL Questions and Communication to
YFA2021@darpa.mil



www.darpa.mil