

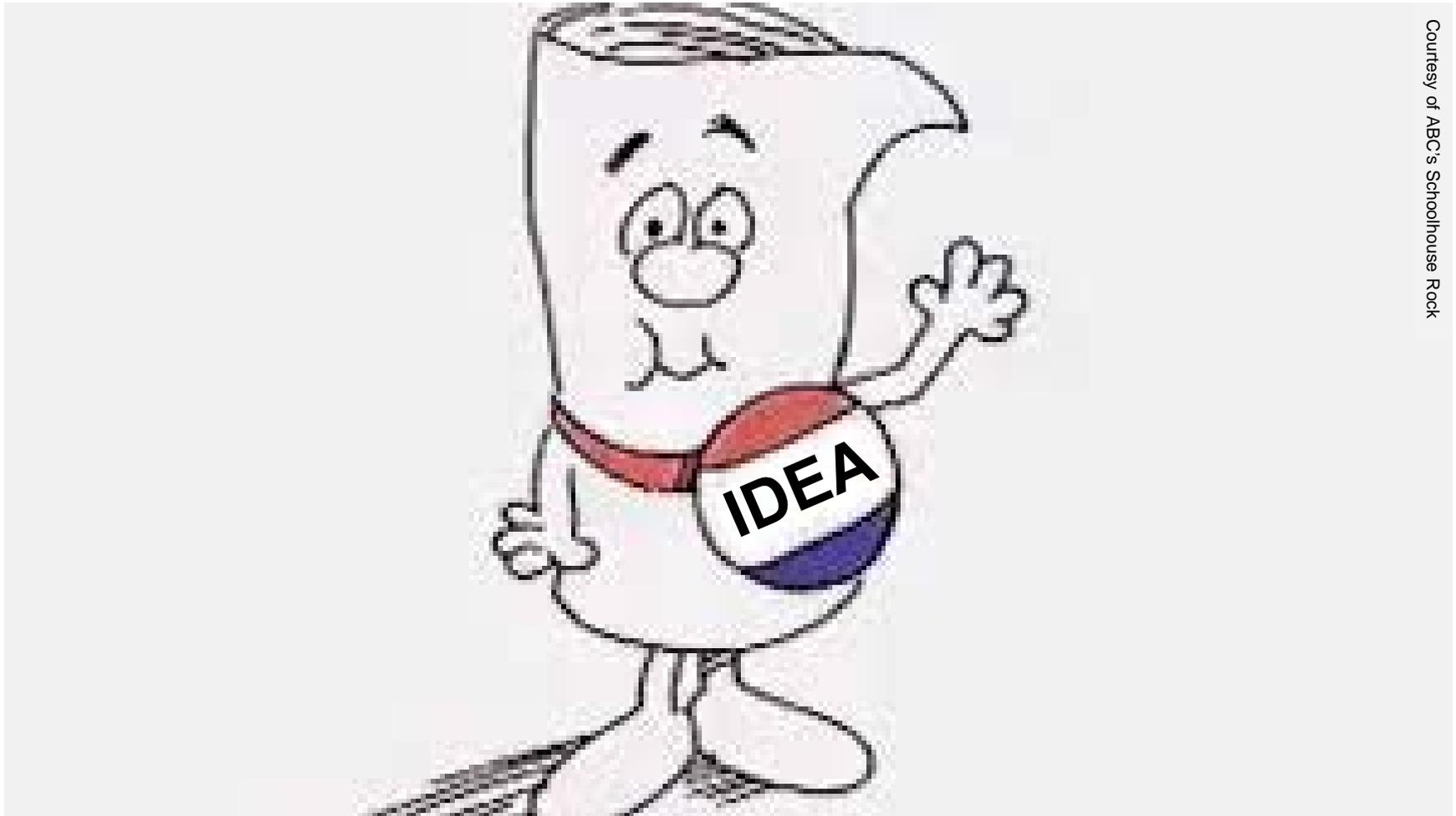
Breakout Session 8: How DARPA Develops Programs: What Goes on Behind the Curtain

Dr. William Regli, DSO Deputy Director

DSO Proposers Day

June 22-23, 2016





Courtesy of ABC's Schoolhouse Rock



The Program Life Cycle



- **Concept**
- **Seedling**
- **Evaluation**
- **Presentation**
- **Acquisition**
- **Execution**
- **Reporting**
- **Completion**

All program phases are led by one or more DARPA Program Managers.
(typically one)

Program Managers:

*They Make
it Happen!!*



Courtesy of ABC's Schoolhouse Rock



The Program Life Cycle



➤ **Concept**

➤ **Seedling**

➤ **Evaluation**

➤ **Presentation**

➤ **Acquisition**

➤ **Execution**

➤ **Reporting**

➤ **Completion**

○ **PM originated**

○ **Other internal**

- Office Director
- DIRO

○ **Other DoD**

- Urgent user needs
- Identified long-term gaps
- OSD, DSB, etc

○ **Other external**

- Industry, Academia, Community
- Workshops, RFIs



Engage the Community



Courtesy of ABC's Schoolhouse Rock



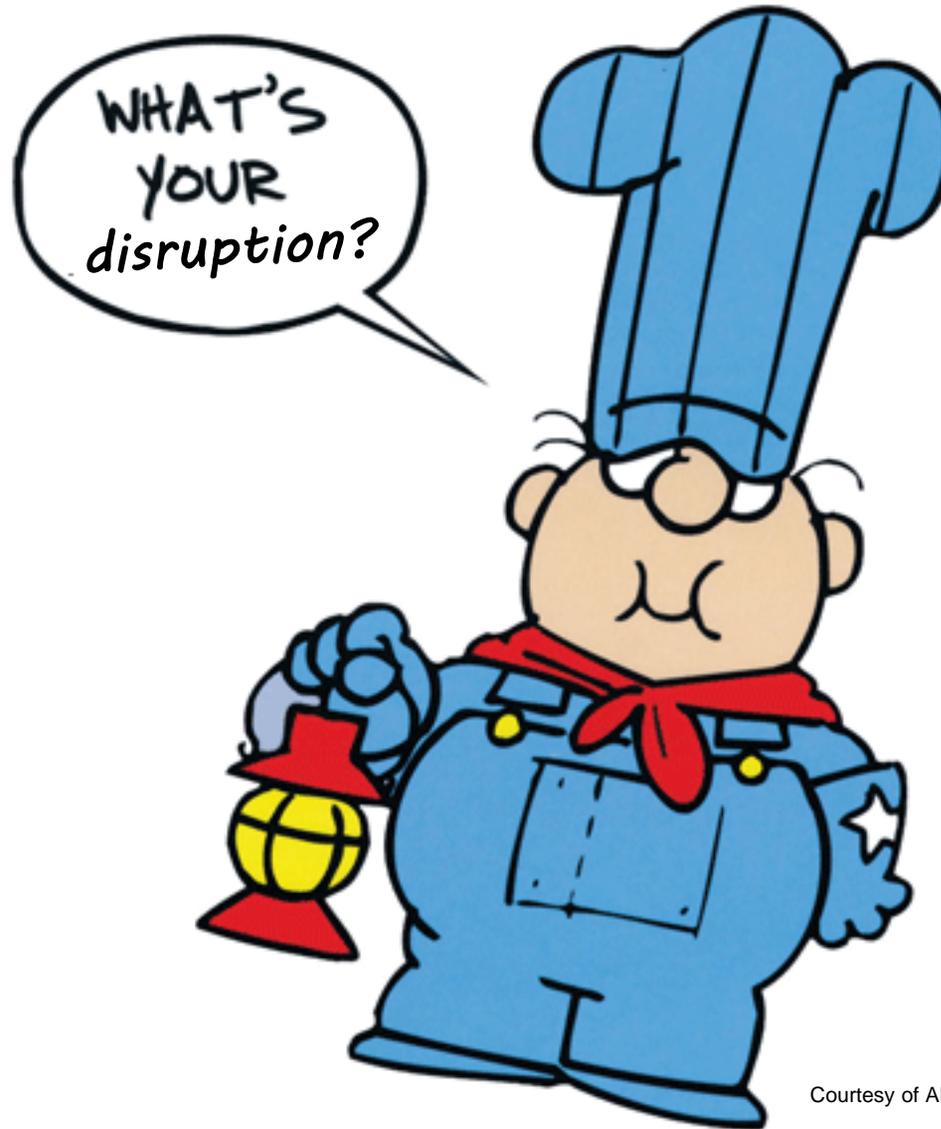
The Program Life Cycle



- Concept
- **Seedling** ————○ **Prove that key concepts have merit**
- Evaluation ○ **Generally 3 to 9 months**
- Presentation ○ **Generally 1 to 2 FTEs**
- Acquisition
- Execution
- Reporting
- Completion



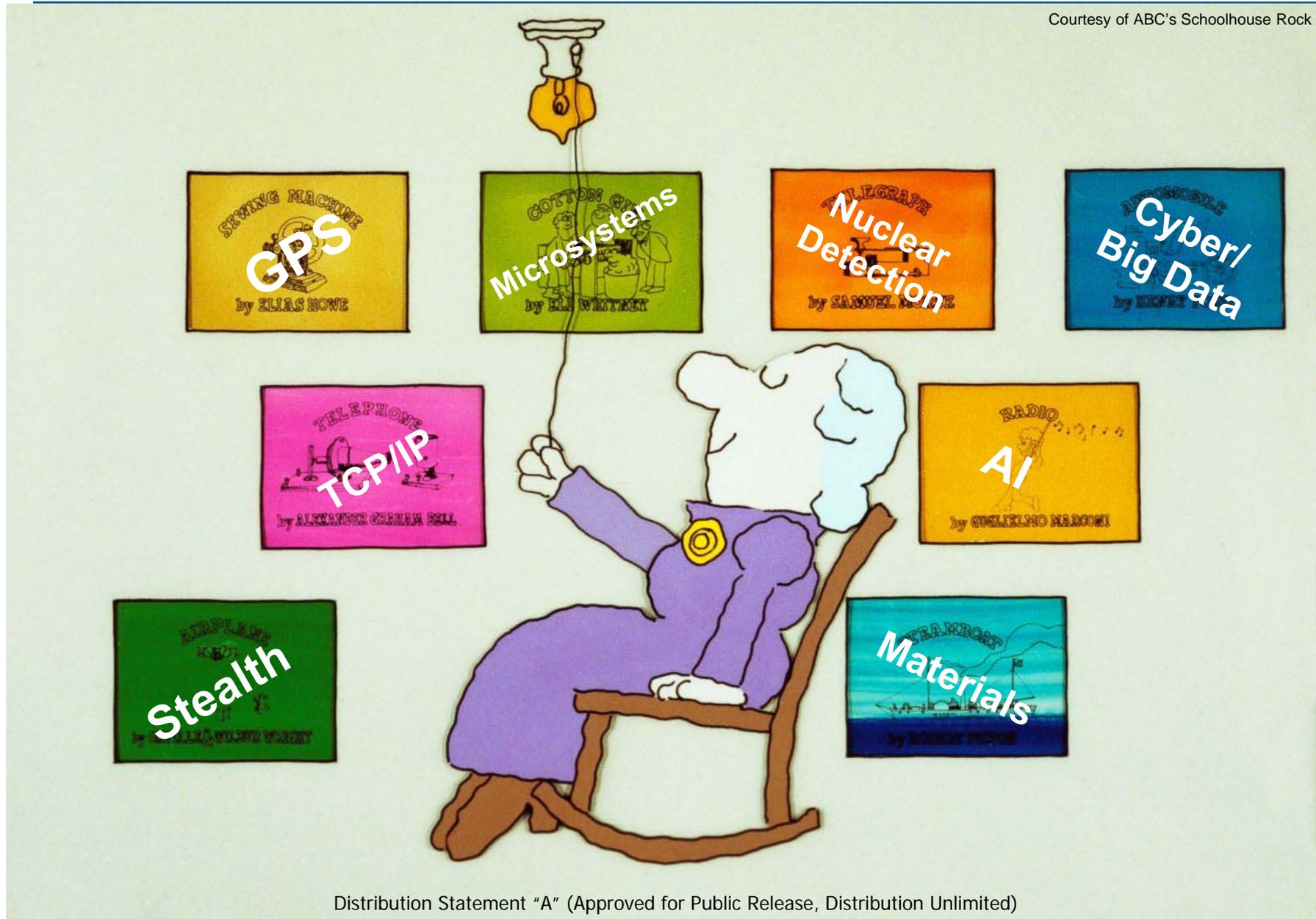
What are you trying to do: Designing Disruption



Courtesy of ABC's Schoolhouse Rock



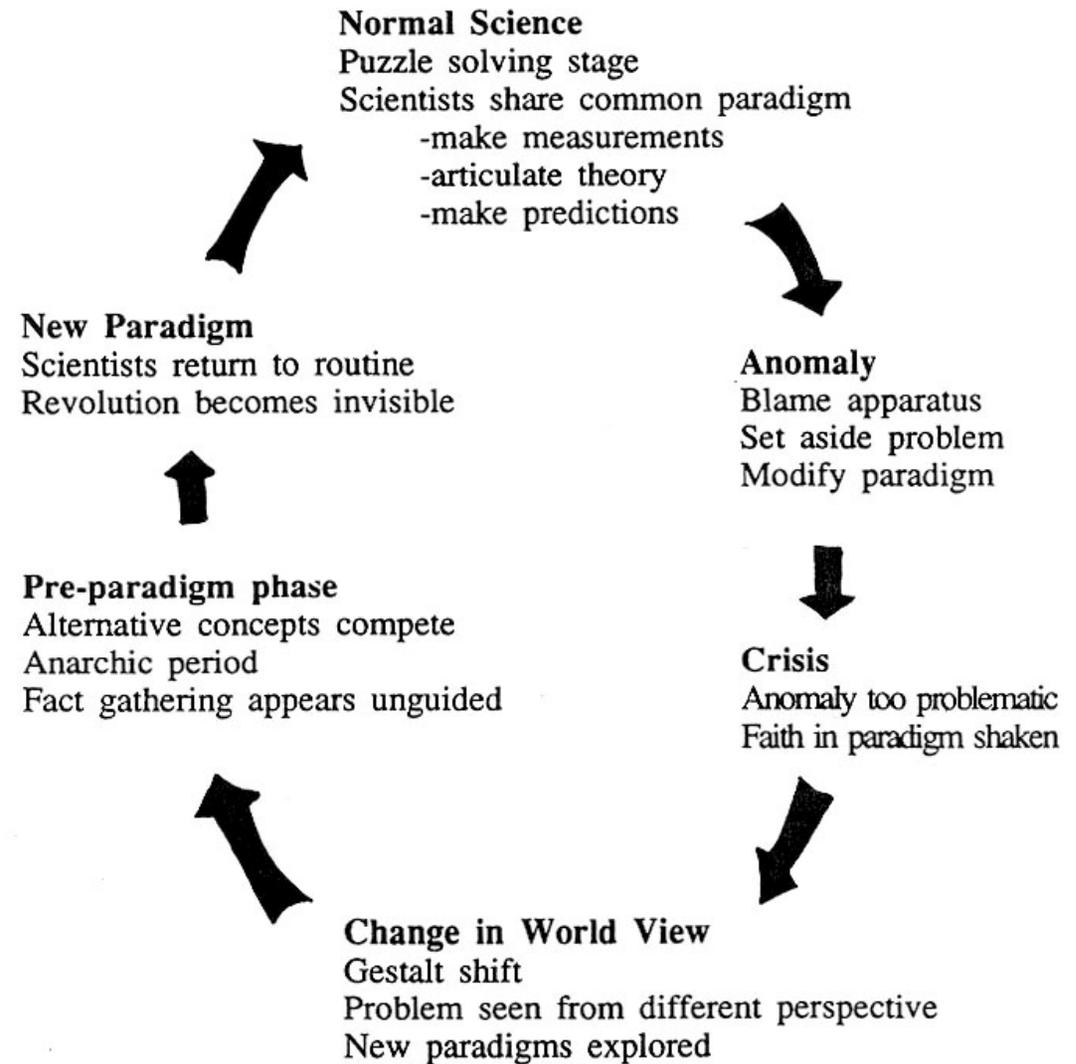
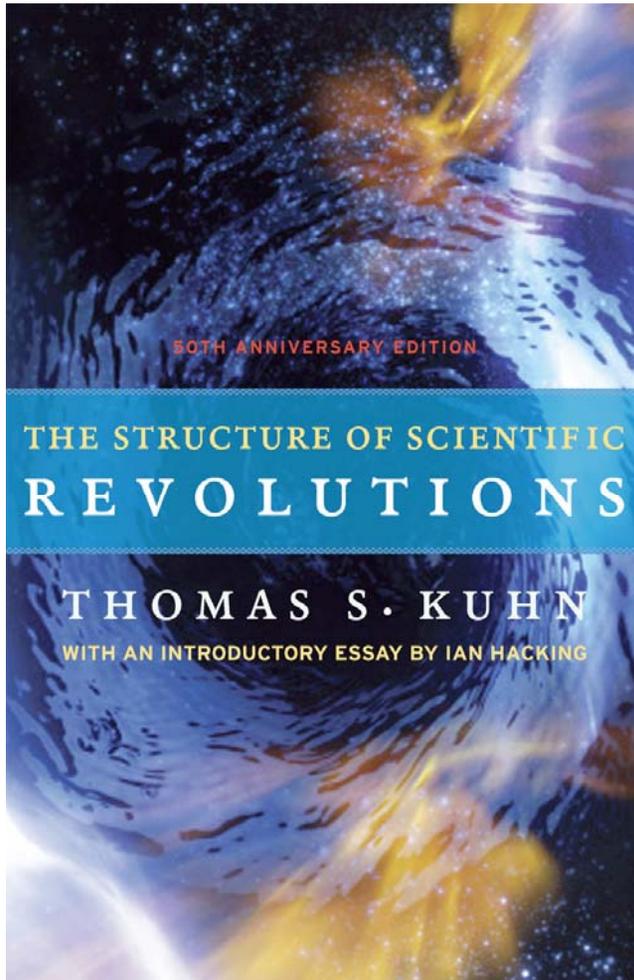
Courtesy of ABC's Schoolhouse Rock



Distribution Statement "A" (Approved for Public Release, Distribution Unlimited)



The DSO Ideal



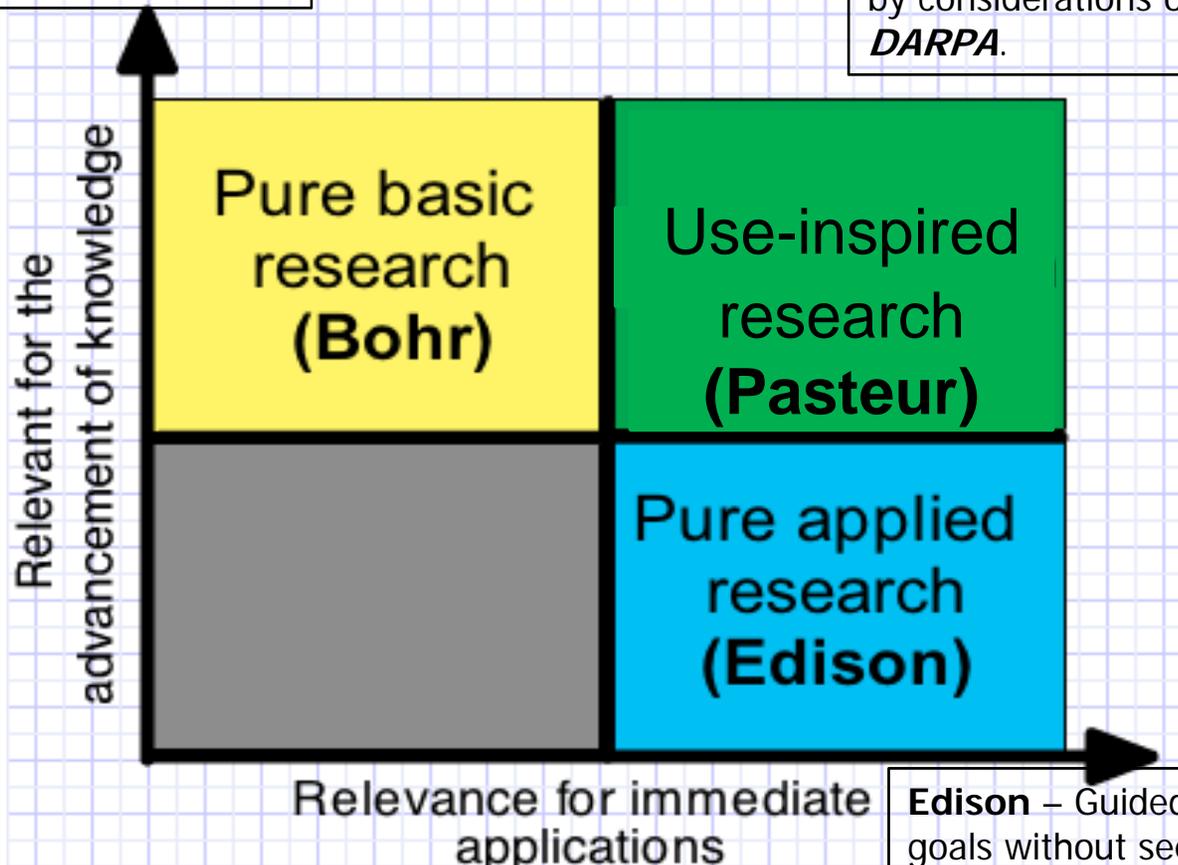


Pasteur's Quadrant: DARPA's Power Lane



Bohr – Guided solely by the quest for understanding without thought of practical use.

Pasteur – Includes research that seeks to explain the frontiers of understanding, but is also inspired by considerations of use. ***This is DARPA.***



Edison – Guided solely by applied goals without seeking a more general understanding of the phenomena of a scientific field.





Think like a PM: What are we reading?



- The Second Machine Age, E. Brynjolfsson and A. McAfee (2012)
- Antifragile: Things That Gain from Disorder, N. N. Taleb (2012)
- Superintelligence: Paths, Dangers, Strategies, N. Bostrom (2014)
- The Origin of Wealth, E. Beinhocker (2006)
- The Swerve: How the World Became Modern, S. Greenblatt (2012)
- Endless Forms Most Beautiful: The New Science of Evo Devo, S. Carroll (2006)
- On Intelligence, J. Hawkins (2005)
- Quadrennial Defense Review
- Driving in the Dark: Ten Propositions About Prediction and National Security, R. Danzig (2011)
- Various reports from the NAS & NAE and DSB
- Some classics
 - Pasteur's Quadrant: Basic Science and Technological Innovation, D. Stokes (1997)
 - The Sciences of the Artificial, H. Simon (1996)
 - The Structure of Scientific Revolutions, T. Khun (1970)



The Program Life Cycle



- Concept
- Seedling
- **Evaluation**
- Presentation
- Acquisition
- Execution
- Reporting
- Completion

- **Assess concepts/ideas:**
 - Does the idea have merit?
 - How much will it cost?
 - How long will it take?
 - How much risk is involved?
 - Is the program *suitable for DARPA*?
- **Evaluations are typically performed at the "Office" level**





There are Lots of Worthy Ideas



Courtesy of ABC's Schoolhouse Rock



The Program Life Cycle



➤ Concept

➤ Seedling

➤ Evaluation



➤ **Presentation**

➤ Acquisition

➤ Execution

➤ Reporting

➤ Completion

- **The Program Manager briefs the concept at the Director DARPA level to the “Tech Council”**
- **Must answer the “Heilmeier” questions...**



The Heilmeier Catechism



To help bring rigor and formality to the program-development process, DARPA Director George Heilmeier developed a set of questions that every program manager was required to address when formulating or proposing a new program.



Dr. George H. Heilmeier
Director DARPA 1975-1977

- **What are you trying to do?** *Articulate your objectives using absolutely no jargon.*
- **How is it done today, and what are the limits of current practice?**
- **What's new in your approach and why do you think it will be successful?**
- **Who cares?**
- **If you're successful, what difference will it make?**
- **What are the risks and the payoffs?**
- **How much will it cost?**
- **How long will it take?**
- **What are the midterm and final "exams" to check for success?**

This formalism has become known as “The Heilmeier Catechism.”
It is the program-definition formalism still in use at DARPA today.

Courtesy of ABC's Schoolhouse Rock



Distribution Statement "A" (Approved for Public Release, Distribution Unlimited)



The Program Life Cycle



➤ Concept

➤ Seedling

➤ Evaluation



➤ **Presentation**

➤ Acquisition

➤ Execution

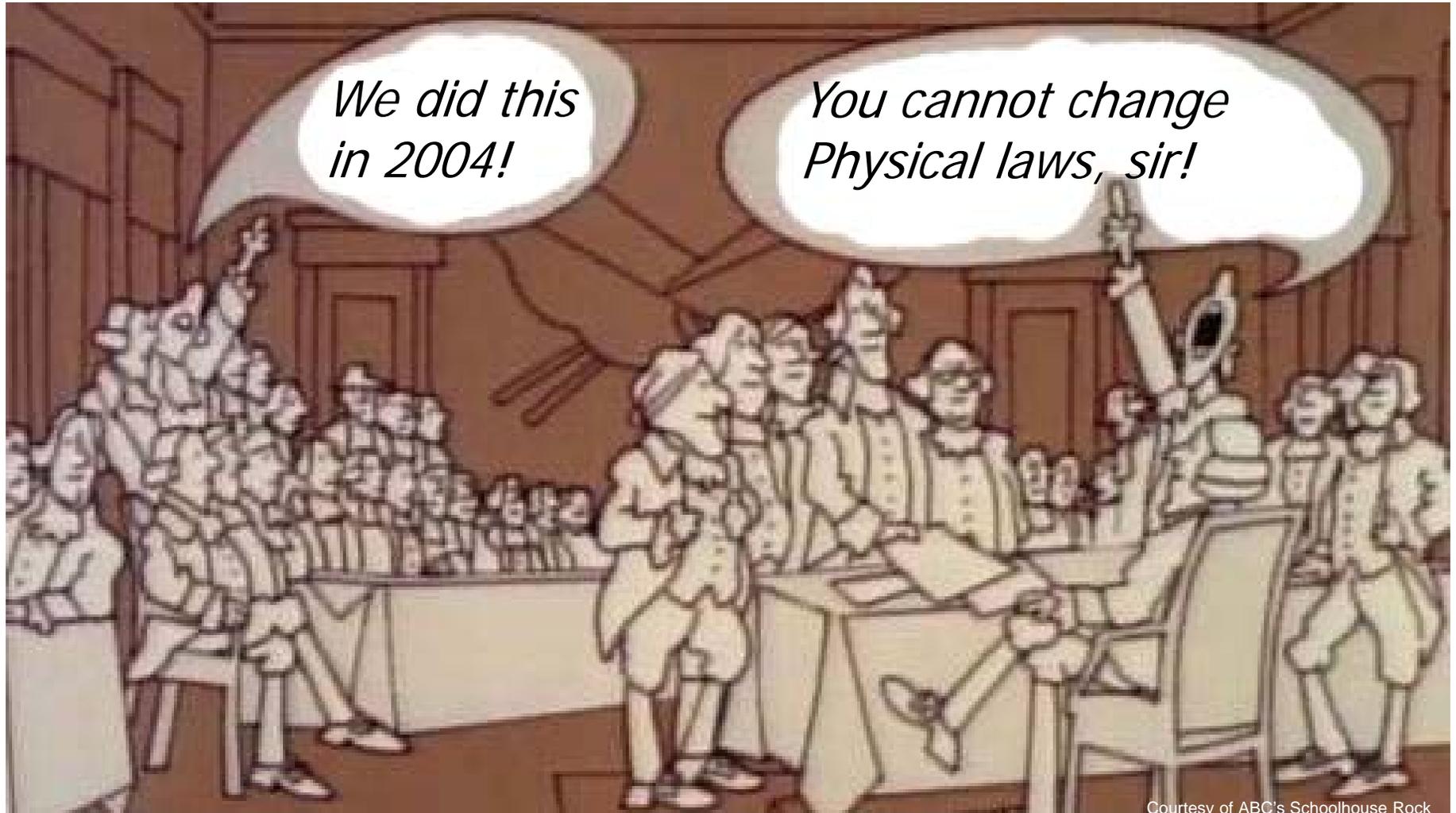
➤ Reporting

➤ Completion

- The Program Manager briefs the concept at the Director DARPA level to the “Tech Council”
- Must answer the “Heilmeyer” questions...
- Decision is often quick



Rigorous Scientific and Policy Debate Occurs...



Courtesy of ABC's Schoolhouse Rock



The Program Life Cycle



- Concept
- Seedling
- Evaluation
- Presentation
- **Acquisition**
- Execution
- Reporting
- Completion



- **Solicitation is released**
- **Often, the PM will hold an “Industry Day” meeting**
- **“Scientific review” process is used for proposals**
- **Outbrief to Scientific Review Official**
- **Acquisition package goes to Contracting Officer (CO) and Contracting Officer Representative (COR) for award**

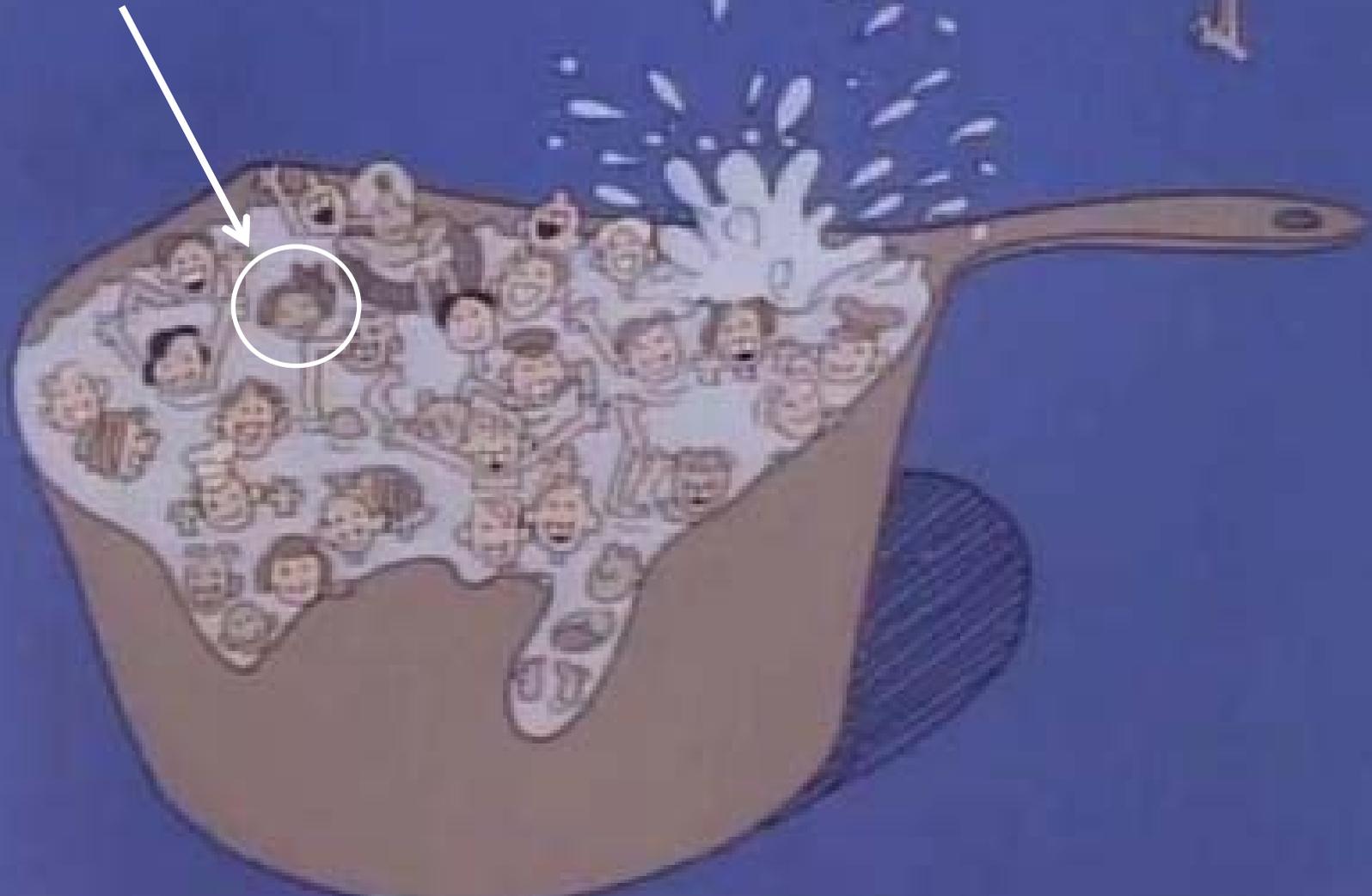


Building the Program out of the Submissions...



Courtesy of ABC's Schoolhouse Rock

You and your idea....



Distribution Statement "A" (Approved for Public Release, Distribution Unlimited)



The Program Life Cycle



- Concept
 - Program kickoff
 - Periodic internal program reviews
 - Periodic meetings with prospective transition partners and other stakeholders
- Seedling
- Evaluation
- Presentation
- Acquisition
- **Execution**
- Reporting
- Completion



Program
Managers:

We Actively
Manage
Programs



Courtesy of ABC's Schoolhouse Rock



The Program Life Cycle



- **Concept**
 - **Seedling**
 - **Evaluation**
 - **Presentation**
 - **Acquisition**
 - **Execution**
 - **Reporting**
 - **Completion**
- **Periodic briefings/updates for the Office Director**
 - **Annual briefing/update to the DARPA Director**





Smoothly running DARPA Program...



Courtesy of ABC's Schoolhouse Rock



The Program Life Cycle



- Concept
 - Seedling
 - Evaluation
 - Presentation
 - Acquisition
 - Execution
 - Reporting
 - **Completion**
- **Transition (if applicable) to key stakeholder(s) for employment and continued support/development**
 - **Contract closeout**
 - **Program completion report**





Courtesy of ABC's Schoolhouse Rock



END
