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SCITECH

Seize the Means of Knowledge Production!

The thing about technology: you gotta know how stuff works to make technology. Since the beginning of humanity, each successive generation has naturally accumulated more and more knowledge about the mysterious universe we seem to have found ourselves in. This ever-accumulating mass of knowledge is used by humans in all kinds of ways, but it's clearly seen in the artifacts of each era-defining technology. Then, it makes sense to argue that even the act of creating a system that *produces knowledge* is its own evolving technology, from the stone tools of the Stone Age, the telescopes of the Renaissance, to tiny computer chips powering our Modern Information age. All of these eras required knowing a thing or two about this or the other, and relied on a formal means of *knowledge production* to reach that goal. I follow Aarthi Vadde and Melanie Micir in "Obliterature" when they argue "institutionalization, disciplinarity, and the deracination of knowledge production" describes the exact circumstances we as humans have with our knowledge today (Vadde and Micir, 2018). Scattered across various institutions of the United States, there are people getting paid real money to produce knowledge– the scale of this entire operation is nauseating. I urge the reader to find their bearings, because I am about to ask an even more nauseating question: Why are institutions producing knowledge? And the sad answer is: the United States Military wants to know more about war technology and is using millions of brains to do it. In a country shackled to its Military-Industrial pipeline, most of the funding that pays the salaries of knowledge producers starts in the hands of the U.S. Defense

Advanced Research Projects Agency. In this paper, I argue with a clenched jaw that DARPA is the most efficient knowledge production system to-date.

If you look back at the last 20 years, you will notice a pattern of newly-founded government agencies modelling DARPA's unique innovation model because it's just that good of a knowledge production system. Even other world governments outside of the United States are starting their innovation agencies with the same principles as DARPA, like ARIA for the UK. Even though five letters comprise the acronym DARPA, world governments are only interested in the last four, ARPA, which stands for Advanced Research Projects Agency. The D, for Defense, just describes what ARPA is used for. An ARPA performs research in advanced subjects that are canonically outside of the box. ARPA-H, recently proposed by President Biden, plans on funding a $1 billion dollar agency for Health promising to eradicate cancer. ARPA-E, which is the Advanced Research Projects Agency for the Department of Energy, tries to use this method of knowledge production to innovate better energy methods. I imagine it is a pretty fun job to think creatively about issues that directly affect the material conditions of our human reality. Wouldn't it be fun/productive to use the ARPA method of knowledge production to solve climate change or something? Isn't a labor that encourages you to imagine and play with ideas and solve humanity's problems wholly fulfilling? I urge the reader to consider how even though the DARPA model started in the Defense-minded, this model is surprisingly congenial to human fulfillment and can be applied to actually productive systems.

Looking back at DARPA's recent history, from 2000-2022 we can notice the ideological shifts that are the reason for ARPA.. This era of time corresponds to the birth of the Open Science movement: publish publicly accessible highest-quality scientific research to encourage a network of open scientific collaboration for a robust form of innovation. A major reason I am

even able to write on DARPA's method of knowledge production is that they now publicly publish the details of ongoing projects because the Department of Defense strategically concluded that developing public lines of research communication outweighs the risk of "adversaries" having knowledge on what the United States is researching. You can contrast this with a Cold War-era knowledge production, where top scientists kept silent, through confidential technical reports, so they could beat Russia to certain kinds of technology.

DARPA started their own podcast on Spotify in 2016, "Voices from DARPA," where project managers are interviewed on what they research for DARPA and their experience within the agency. In episode 39, an interview with the "What-if Chemist" reveals a very important aspect of the knowledge production operation: the role of American institutional universities to DARPA:

The role in terms of scientific innovation and the ecosystem: the universities are sort of the front line. In Department of Defense terms, they are the tip of the spear. They are the ones in the labs doing the research with grad students, post-docs, and undergrads, and faculty, and research staff pushing the boundaries making the discoveries and innovating of course (DARPA, 2021).

Parallel to the physical wars the Department of Defense wages on behalf of the American people, our sociotechnical system of knowledge production considers itself at war with knowledge, and uses PhDs to undergrads as their soldiers to fight a war only DARPA knows what it's for. It is difficult to think about all the ways in which DARPA exploits students, puts them at the tip of their spear without their consent, to push the boundaries of scientific

knowledge so our missiles are more accurate or something. This same project manager, the "What-if Chemist" is developing technology that can absorb water out of the air and into a wearable backpack. Soldiers could regenerate their daily requirements of water passively. What if this knowledge was free and available to everyday citizens, people who are in dire need of access to drinking water?

While it is clear that using the chemical properties of water to create a technology that passively absorbs drinking water from the atmosphere is beneficial to humanity, DARPA's biggest issue is the fact that all of this innovation must be done for the sake of war! This april of 2022, Canada announced their own innovation agency, an institution that will discover and learn about ideas that push our collective knowledge to new limits like DARPA does for the United States. This information was presented in a Nature article, "Canada announces new innovation agency — and it's not modelled on DARPA," which shows that world governments are aware they need to scale up their R&D to keep pace with DARPA. But Canada is taking a more mature approach to knowledge production, noting that "a lot of DARPA's prosperity comes from the deep-pocketed US Department of Defense buying its inventions — something that isn't replicated in Canada and other countries." Thankfully, many other countries do not spend exorbitant amounts of money on their military like the U.S., so their economies steer governments "towards a model that helps companies to develop technologies and take them to market quickly" (Owens, 2022). A horizontal change from knowledge production for the military to knowledge production for big businesses. For our largest institutions like the Military and Industry (Technology, Sales, etc.) who rely on knowledge production to keep profiting, they choose the model that DARPA uses for innovation. I believe that these institutions have the privilege of direct access to knowledge to think about problems the right way. Consider the

workers who spend their lives merely surviving in this system who do not have the privilege to gain knowledge that will increase their standards of living, and all the knowledge that has yet to be produced that would make their lives easier.

So, let's hack up an ARPA for the people, seize the means of knowledge production. Let us understand the consequences of the Open Science movement, the principles DARPA takes towards knowledge production, and consciously reject any mode of science that directly benefits technology of war. I will describe practical free-to-adopt strategies so knowledge production is performed by the will of everyday people. First, consider the topology of an organization like DARPA, this corresponds to the STS method of analyzing the network of an actor-network pair. A journal entry from Industrial and Corporate Change titled "DARPA and its ARPA-AE and IARPA clones: a unique innovation organization model" provides ten characteristics that DARPA uses to "enhance its ability to operate at both the institutional and personal innovation organization levels," there are three that I note:

1. *"Flat"* - DARPA refers to all employees the same, there is no hierarchy, classless even.
2. *"Focus on impact not risk*" - DARPA understands that knowledge production needs room for risky ideas that are unconventional but have the chance to change the world.
3. *"Acceptance of failure"* - People fail sometimes! It is *human* to fail, learn from your failure, and rise again. (Bonvillian, 2018)

A hierarchy-less labor system may be a familiar concept to other groups seizing other means of production, and its importance remains the same here. There is real power in being on the same level as everyone else. Ironically, the inner-workings of this agency resemble that

classless, needs/wants-based structure that many thinkers on the left have advocated for in Modern times as well. The United States gives massive funding to a horizontalist system of labor because it helps the military, but won't spend that same amount of money to give you the same working conditions. Also notice how the United States Military seemingly abandons Command and Control for efficient knowledge production, probably because it slows down progress. Who knew?

So far we have seen how DARPA, leveraging collaboration and sharing, is a classless society of research that is efficient and effective in knowledge production. DARPA also drives innovation by creating competitions; different teams of researchers pretty much play competitive games against each other, like artificial Space Races but for more than just going to space. In a public-facing article, "Prize Challenges," DARPA explains why the agency uses competitions where the winner is awarded prize money instead of traditional research contracts. They reason: "Prizes Encourage Thinking Outside the Box, Prizes Encourage Broad Participation, and The Economics Are Great" (DARPA). These lessons most likely came from the experiences of DARPA project managers playing games with their friends as children. Think about how fun it was to compete against your friends, and how the spirit of competition pushed you to make something great. Being surrounded by others who push you forward all for the sake of play feels like the glow of childhood everyone deserves to feel.

If you really step back and forget that I am talking about research and development for Military technology, it sounds like this system of knowledge can do some great things! It is absolutely vital that the knowledge we produce is outside the box, a composition of every single different perspective in the most efficient way possible. The problem is that the Military is using these good values to perpetuate war and horrific treatment of human life. ARPA is structured

upon essential topological principles that set it up for success, as well as collaboration and (healthy!) competition that makes it a desirable strategy, from governments to people. It is my duty to urge you to, with a clenched jaw: incorporate these knowledge production principles in your everyday life; create local ARPA networks to regenerate your community. DARPA makes no effort to help the public adopt these principles, so it is up to us to seize the means of knowledge production.

Works Cited

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