CHAPTER 6

What We Can Learn from the United States about Leading AI Transformation150

Artificial intelligence has been hyped in the U.S. innovation system.[151] From the Americans' perspective, AI is one of the main catalysts for innovation today. The U.S. has a relevant culture and a good system of innovation to continue to lead emerging world technologies. At the beginning of 2019, the White House unveiled a national AI initiative; the plan focuses on the relationship among industry, the education system, regulation, policy, the military and the government.[152]

On the one hand, it is difficult to figure out the U.S. strategy for AI and exactly what the plan is to take it to the era of AI. On the other hand, all the countries that have strategies for AI want to learn from the U.S., and they are striving to join U.S. companies. "Culture eats strategy for breakfast,"[153] and the U.S. has a culture of innovation. At present, the largest and strongest digital companies that are developing AI are in the U.S. Therefore, it is very important to answer the question "How is the U.S. preparing and building itself for the AI revolution, and what can we learn from the process?"

"We Have No Choice"

"We have no choice." This is the first thing I heard from several leaders in the U.S. China and Russia are accelerating their AI capabilities, and the U.S. has no choice but to forge ahead and lead the field. For example, China, which is widely considered to be the biggest threat to American technological leadership, released a plan in July 2017 for dominating the global AI market. Allies like France, Canada, and the U.K. have also unveiled their own national AI strategies. Consequently, the U.S. has no choice but to be the world leader in AI transformation.[154]

In addition, national and economic leaders believe that AI is not just a temporary buzzword, but think that it is a serious issue with significant potential. They look at AI as the current engine for their innovation system, yet at the same time recognize that its development is decentralized and a challenge to coordinate. Finally, these U.S. leaders understand that there must be partnerships between government and the private sector, as well as with allies, in order to succeed on the AI journey.[155]

A Systematic Process

One of the decisions that U.S. leaders are discussing is building a systematic process for AI, that would include maintaining a constant status report about the development of AI in relevant agencies and organizations. In addition, they are planning to build a pipeline for AI development that includes universities, industry, the workforce, and others. They decided that every agency and organization needs to build its own AI strategy, and that the government needs to build centers to help increase the speed of the processes and make them successful. From the budgetary perspective, the U.S. decided that first of all, every governmental organization needs to allocate part of its budget for AI and to report on how much it is and what it is for. In the coming years, the government will increase the overall budget for AI. The U.S. recognizes that it must increase AI resources every year, including budget, research and development, and the workforce. For example, DARPA committed $2 billion to explore state-of-the-art AI applications over the next five years; overall, the U.S. government plans to develop AI systematically.[156]

The Main Idea of the American Plan for AI

The two important words needed to understand the U.S.'s plan are *accelerate* and *harness*. The first idea is to accelerate AI capabilities and to accelerate the real potentials for AI. This means that the future will have different types of AI

capabilities, and the government's responsibility is to accelerate and facilitate the process and continue to lead this field. The second is to harness the capabilities of AI to improve national defense, which means that the government is responsible for discovering where, when, and how AI can help national defense missions and then to make them happen.[157]

The Key Principles for Leading AI Transformation Experimentation

The *first* step of AI transformation is experimentation. The idea is to choose a few specific missions that AI can help now, and to build AI projects for them. It is important to note that the U.S. leaders believe that when developing AI, they must embrace risks and accept failures. They understand that in the field of AI, the best way to improve is through experimentation; therefore, early failures on a small scale are required for overall success and for the acceleration of AI. This concept goes against traditional U.S. military and governmental culture, in which the desire is to check the conditions and act only when conditions are secure and safe, and when success is certain. However, when it comes to AI development, the Americans realize that it is essential to take risks and experience multiple small failures in order to succeed in the larger process of AI transformation. It seems that in the field of AI, the U.S. has chosen a strategy similar to that of a hi-tech entrepreneurial company.[158]

The Foundation

The *second* step of AI transformation is building a basic common foundation. AI projects need data, a way to keep and organize it, and powerful computing to handle the quantity of the data. Traditionally, national organizations are lacking in all of these fields, and a common foundation and infrastructure are crucial. The foundation includes an idea about how to build a field of 2,000 GPU servers,[159] a project to help use industry clouds for national security, and an effort to improve the culture of sharing data. The bottom line is that the current foundation needs improvements to enable the AI Revolution. The first improvement that must be made is the ability to find the relevant data, including "government data," and the ability to use it (an important key to achieving this goal is data regulation).[160]

Collaborations and Bridges
Strengthening the Bridges between National Security, Academia, and the Private Sector

Historically, the U.S. has leveraged close relationships between defense, academia, industry, and the private sector. For example, DARPA is a unique organization whose mission is to build bridges between government, academia, and industry, and to constantly strengthen these connections. The Department of Defense is also responsible for building these relationships and constantly improving them, by relevant acquisitions and projects.

The *third* decision of the U.S. is that AI requires new collaborations between the military, industry, and academia. In addition, AI transformation also requires new collaborations with allied countries. These collaborations need to be synergistic, to enable new capability leaps, and to enable engagement and evolution. Moreover, America's leaders are looking for potential opportunities to merge research and operations to fulfill specific missions, as well as to learn from these experiences. Ultimately, the leaders want a circular innovation system in which government will empower the private sector; after that, the private sector will empower the government, the national security establishments, and the economic situation. This circular innovation system will continue to mutually empower every component going forward into the future. This is the ideal innovation system, and currently the U.S. is implementing AI as a part of it.

Consequently, the U.S. decided that DARPA, DNI (Directory of National Intelligence) and other government establishments are required to develop the next generation of collaboration to introduce the technologies of Silicon Valley into the military. This revolution includes the ability to share successes, failures, talented people, data, and so on. In addition, it requires a new concept for acquisition, and partnership with academia, as well as for using these bridges to build data centers, new labs, and new capabilities.[161]

Laws and Ethics

The *fourth* step is to build the system of laws and ethics to address these new capabilities. Nowadays, Google knows much, much more about all of us than Stalin ever knew about his people. Without a system of laws and ethics, AI has the potential to undermine freedom. One of the Western world's challenges is China's and Russia's declaration that they want to be a part of this system of laws and ethics. However, they know that such a system will create problems for the U.S., China and Russia can potentially sign onto this new AI legal system and then continue to do whatever they want without following the new rules.[162]

"The Joint AI Center (JAIC)" – A New Heart for AI

In 2016, the U.S. Defense Innovation Board, chaired by Eric Schmidt, recommended the creation of an AI and Machine-Learning Center of Excellence inside the Department of Defense to spur innovation and transformational change. He added that an organization of this type could also create a single focal point for Congress to consult on defense-related AI issues. The *fifth* step is implementing this recommendation. AI development is currently supervised by a new DoD unit, the Joint AI Center (JAIC). This decision is meant to build a unique system to help accelerate AI capabilities and concepts. The JAIC is headed by a three-star general; its purpose is to address the complicated situation, enable the partnerships outside the military, and accelerate and lead the AI Revolution.[163]

AI and Cyber

The *sixth* step is to focus on AI and cybersecurity. From the American perspective, it goes both ways: AI helps cybersecurity and cybersecurity can help AI. Therefore, the U.S. military organizations need to focus on the relationship between cyber and AI; this includes using AI to improve the ability of analysts to deal with infinite data from cyber. An example is using speech-to-text and machines to figure out unique details from databases. In addition, it includes a plan to use AI to improve both defensive and offensive cyberspace capabilities.[164]

The U.S. and the Concept of FAST – A Comparative Analysis

Basically, the American plan for AI deals with the main characteristics of Foundations, Acceleration, and Singularity Time. However, to empower their plan, I recommend paying attention to a few issues that have not received any unique focus:

- Creating a "closed-open-closed" network to address and merge classified and unclassified data
- Learning from China and building strategy for leading "world data"
- Creating the "data roads" between various organizations, networks and clouds.
- Acceleration for a few specific big issues (and not as many acceleration projects as possible).

- Empowering the relationships between government and big data companies (Google, Amazon, Microsoft, and IBM) and making these relationships similar to the relationships between the government and companies such as Boeing and Lockheed Martin.

PART 3

Plan of Action

A Framework and Principles for the Plan

The Top 5:

1. Building data centers
2. Developing an innovation system+
3. Structures and functions that can support FAST transformation
4. Accelerating the acceleration
5. FAST for enabling MDO (multi-domain operation)

4 x 4: A Powerful Management Tool and the Required Leadership

Epilogue and Personal Notes