

# WSJ Print Edition

Get ready to be astounded by how technology pushes forward in 75 years.



## INSIDE VIEW

### The Five Mules Pulling the 21st Century

The 20th century was characterized by industrial might, lowering the cost of manufacturing, transportation and computing. The 21st century so far has seen spectacular growth by lowering the cost of information and maybe even knowledge. Here are five mules pulling this century along:

• Asynchronous. Face-to-face meetings. Phone calls. The “CBS Evening News” at 7. Beyond first-class mail, life used to be synchronous. Real time. Snap decisions. Then along came answering machines. Leave a message, I’ll get back to you later. Life became asynchronous—with time to think and react.

Then email. A productivity punch. No one knew if you were at your desk, by the beach or on the throne. Then social media. Facebook. Instagram. Pass along news, gossip or boast away, and others respond on their own time.

But now social media is used almost synchronously. Instant feedback. “Why didn’t you like my livestream?” (Because I took a five-minute break to enjoy reality?) Texting is asynchronous, but expectations are for immediate replies. Zoom meetings are a great commute killer, but are we going back to a synchronous lifestyle? Will our productivity wither? Nah, artificial intelligence promises to bridge sync and async. Our answers are already pre-trained. Don’t ask me, ask ChatGPT. Back to the beach.

• Asymmetric. World War I was a symmetrical war, almost equal size forces dug into trenches. World War II was similar, with air forces and antiaircraft weapons neutralizing each other. Until strategic mistakes and then the Manhattan Project’s big booms tilted the power. The Cold War was about missile throwweights. Since 1989, the U.S. has been the sole superpower. Until China?

For now, wars are small and asymmetric. Sept. 11, 2001, introduced box cutters and 757s as weapons. The war in Ukraine sees drones defeat tanks. Israel repels thousands of incoming rockets and missiles. Hamas had to use hang gliders and hostages to gain short-term advantage against a vastly superior foe.

Yes, asymmetric weapons provide only a temporary advantage. Airport security ended air terror. Precision-guided bombs and tanks defeated Hamas. Patriot interceptors and Iron Dome limit missiles. The mouse can roar, but not for long.

But defense against asymmetry comes at a cost. Interceptors that cost \$100,000 pick off \$500 drones. Still, ingenuity will always win. High-powered lasers can melt drones. The U.S. has deployed a BlueHalo Locust laser weapon system that can shoot down drones with \$3 of electricity, also known as “directed energy.” Asymmetric warfare may be neutralized, until something else comes along.

Don’t forget that Google, Facebook and Amazon were once startups and asymmetric threats against big companies like Borders and Kmart.

• Asymptotic. New technology doesn’t merely seep into the economy, eventually it grows into a Category 5 storm

and starts tearing up trailer parks in its path. Investors provide boatloads of capital to fund growth. Shares grow like asymptotic curves—going up and up, seemingly toward infinity! Railroads. Radio. PCs. Dotcom. Client-server. GLP-1s. And now artificial intelligence.

Inevitably, stock markets overshoot. I liken them to upside- down waterfalls, accelerating the descent until they hit rocks. It's a fun ride, but when do you jump off?

• Assimilative . A smart move is to sell all the way up, until the last investor figures out the greatness of new technology, and then eventually the technology disappears from thought. Electricity eventually assimilated into the economy and our consciousness, outlets everywhere. It simply worked. Water, natural gas, automobiles, the web, cellphone coverage.

Someday soon, AI will simply work. In September, Alexander Arnon, director of policy analysis at the Penn Wharton Budget Model, told the New York Times that AI is “maybe as big and significant as email.” Wow, out on a limb. But you won’t think of it as AI. Instead, like your smartphone, it will be a part of life. Then on to the next thing: quantum computing, longevity, Mars. (OK, maybe not.)

• Asymptomatic. Think about problems we don't see coming. There are no symptoms until it becomes a huge problem. Covid is a classic example. Years before 2020, on the back of SARS in China, the Bush administration took steps to prepare, including building an inventory of face masks. But the scare lapsed, and no one cared. Stored masks deteriorated. AI chatbots have caused suicides. Was that avoidable? Are there GLP-1 long-term side effects? There are plenty of false alarms, carbon footprints and all, and the future is unknowable, but watch for symptoms.

I could go on with more mules. Astute observers will be aspired and astonished by so many assurgent and assistive technologies to ascertain, with aspects that assault all known associated assumptions and assertions. I assure you, the next three quarters of this century will be astounding.

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