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Six Disruptive Technologies
Contribution to GTI Forum Technology and the Future

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By all accounts, the next decade promises to be one of major advances and innovation, comparable to the decade that saw the birth of the Internet and the rise of global tech companies. These changes will likely have significant social impacts, good and bad. As a lifelong science and technology reporter, investor, and junkie, I would like to share some thoughts about what may lie ahead.

Blockchains, the future of finance, and Internet 3.0. A financial system that is not centrally controlled (e.g., by governments, banks, and credit card companies) could in principle help level the playing field and make financial services of many kinds more widely and equitably available. That might be strongly compatible with a Transformed World, especially if blockchains also become the technological standard for elections, preventing manipulation of outcomes by rulers or political parties. More broadly, if information can be stored and shared on blockchains in ways that cannot be manipulated by private or political interests (think Facebook, Fox News, and Trump's Twitter feed), that could also be a potent tool for bottom-up social transformation. Blockchains run by governments, on the other hand, could decimate privacy and liberty: think China on steroids.

Artificial Intelligence. A dangerously powerful tool in the wrong hands (e.g., Facebook, authoritarian governments), but also what is likely to drive very rapid, transformational advances in agriculture, biomedicine, personalized healthcare, educational practices, and possibly politics. It is not at all clear whether this technology can or will be regulated by governments or social conventions.

Fusion power. Close to a breakthrough, thanks to superconducting magnets, fusion could transform electricity generation with small, widely distributed plants that create no radioactive waste and generate cheap power. This is likely the best hope for mitigating global warming and avoiding the worst of the forced mass migration from equatorial regions (and ensuing social disruption) that will otherwise ensue.

Quantum computing and communications. Still in its infancy, but likely to undermine all current cybersecurity measures (although quantum communications could restore security), as well as enabling modeling and problem-solving and AI tools that are immensely powerful. Who will/ should control such tools?

Electrical and autonomous vehicles. This major shift in transportation technology now seems certain, with major benefits to the climate and urban pollution and significant social benefits— fewer accidents, and in urban areas, many fewer vehicles altogether, freeing parking spaces for more productive uses. The costs are real, including job losses among taxi and truck drivers and auto mechanics, but it overall seems a net positive for a transformed world.

Industrial automation, robotics, and 3-D manufacturing. This trend—in package sorting, in manufacturing, in waste recycling—will likely accelerate, reducing many types of routine physical labor jobs but improving efficiency and safety. Together with on-site 3-D parts manufacture, this transformation will create new, higher-paid jobs.

I think that all of these technological transformations will happen, driven largely by market forces. But markets evolve, and are ultimately driven by consumers, so the uses to which these new tools are put depend enormously on what societies decide. Can a more educated populace learn to use these tools (or demand that they be used) for the common good? That question of who decides— governments, the private sector, or more bottom-up social consensus—seems very much up for grabs.

About the Author

Al Hammond is a serial entrepreneur, a widely published author, and a global leader in market-based solutions to poverty. He is co-founder and Executive VP for Strategy of Healthpoint Services, which delivers safe drinking water to rural and small town communities in India, and the former leader the Health for All program at Ashoka, a global network of social entrepreneurs. Earlier, he helped to launch the base-of-the-pyramid movement that transformed how large companies and the international development community address poverty. He has served as a consultant to the White House Office of Science and Technology Policy, to several US federal agencies, to the United Nations, to a number of major corporations, and to several private foundations. He holds degrees from Stanford and Harvard Universities in engineering and applied mathematics.

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