

Notes from the Edge

Insights into an Evolving Future

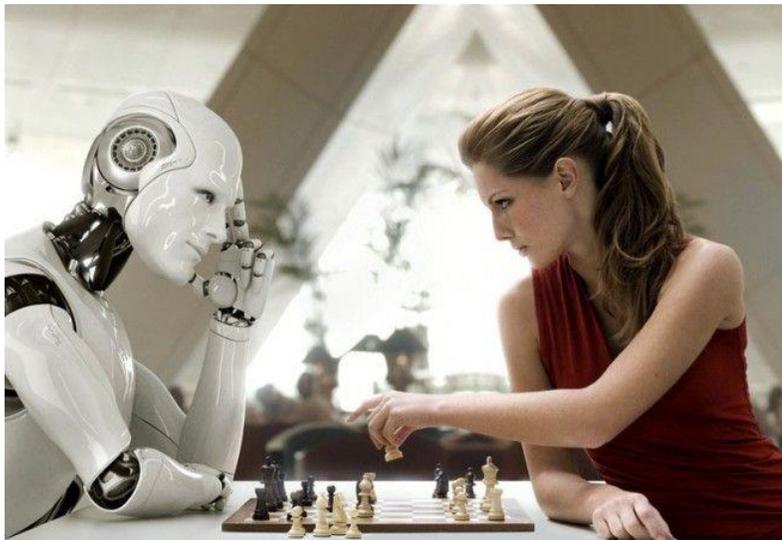


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FORECASTS

What Could the World of Sports Look Like in 25 Years? USA Today takes a look at "Future of Sports", a 50-page document that imagines what's ahead in the sports industry over the next 25 years. These are not so much predictions of what will happen as working versions of what could happen — provocative prognostications based on interviews with academics and futurists, all subject to inevitable revision as Father Time throws his customary curve balls. Topics of interest include shape shifting stadiums, genetically enhanced athletes, watching a game through virtual reality headset from the perspective of your favorite quarterback, and NBA global expansion. [Future of Sports](#)

Making Trends Trendy: These Forecasting Sites Use Science to Predict the Future. A new kind of trend forecasting website may provide scientific insight into what makes people tick, and may finally explain what on earth millennials are thinking. Instead of offering up the latest developments in fashion, design or style, websites like [Cassandra](#) and [K-HOLE](#) provide detailed reports on “macrotrends” and “microtrends” of entire generations, with a focus on generations X, Y and Z. Be forewarned, however, that these websites might be just as difficult to navigate as the mindsets of the generations they seek to investigate. [Forecasting for the Generations](#)

SOCIOLOGY

Transhumanism and Digital Immortality. If you're under the age of 40, there is a good chance you will achieve 'electronic immortality' during your lifetime. This is the idea that all of your thoughts and experiences will be uploaded and stored online for future generations. That's according to a futurologist who not only believes technology will let humans merge with computers, that this will create an entirely new species called Homo optimus. He claims this could occur as soon as 2050. [Optimized Human](#)

CHANGING CHARACTER OF CONFLICT

Technologies Converge and Power Diffuses: The Evolution of Small, Smart, and Cheap

Weapons. Dramatic improvements in robotics, artificial intelligence, additive manufacturing (also known as 3D printing), and nanoenergetics are dramatically changing the character of conflict in all domains. The convergence of these new and improving technologies is creating a massive increase in capabilities available to smaller and smaller political entities—extending even to the individual. This increase provides smaller powers with capabilities that used to be the preserve of major powers. Moreover, these small, smart, and cheap weapons based on land, sea, or air may be able to dominate combat. This new diffusion of power has major implications for the conduct of warfare and national strategy. Because even massive investment in mature technology leads to only incremental improvement in capabilities, the proliferation of many small and smart weapons may simply overwhelm a few exceptionally capable and complex systems. The advances may force the United States to rethink its procurement plans, force structure, and force posture. [Small, Smart, and Cheap](#)

Space warfare with Russia and China? Pentagon urged to prepare for it. Satellites have soared over the earth's atmosphere for decades, providing the United States with a huge advantage militarily, even at a time when the conventional weapons U.S. rivals have are formidable. A new report released on Wednesday by the Center for a New American Security highlights the vulnerabilities the Pentagon has in space, and calls for a shift in strategy to safeguard it and prepare for conflict there. It argues that potential adversaries like China and Russia have noticed the degree to which the United States is reliant on its "space architecture," and has begun ways to threaten it. The author argues that regardless of what steps the military takes, it is unlikely the United States will ever have unchallenged dominance in space again. Therefore, the United States needs to consider adjusting what it will do if a satellite is attacked. [Space: The Next Frontier](#)

TECHNOLOGY

Graphene Optical Lens a Billionth of a Meter Thick Breaks the Diffraction Limit. With the development of photonic chips and nano-optics, the old ground glass lenses can't keep up in the race toward miniaturization. In the search for a suitable replacement, a team from the Swinburne University of Technology has developed a graphene microlens one billionth of a meter thick that can take sharper images of objects the size of a single bacterium and opens the door to improved mobile phones, nanosatellites, and computers. Once the technology is mature, the team sees it as having applications beyond microscopy, such as in lighter, thinner mobile phones with thermal imaging capabilities, smaller endoscopes for surgery, as a replacement for conventional lenses in nanosatellites to save a couple of hundred grams of launch weight, and to increase the efficiency of photonic chips in supercomputers and superfast broadband distribution. [Microlens](#)

Super-secure Quantum-based Data Encryption for Everyone. With a new device set to make unbreakable, quantum-based cryptographic security available for everyone for the very first time, ordinary people will be able to use cryptographic systems that – until recently – only existed as experiments in the most advanced physics laboratories. Using technology developed at the Los Alamos National Laboratory (LANL) and incorporating the quantum mechanics of random photon polarization, the new device generates random numbers and creates cryptographic keys so fast and so securely that the technology is said to revolutionize high-speed cryptography and offer a completely new commercial platform for real-time encryption at high data rates. [Encryption for Everyone](#)

RESOURCE COMPETITION

Move Over, China – India Will Drive Future Oil-Demand Growth. Worried about China's future oil demand? Fear not. India will pick up the slack and, in fact, overtake China as the main engine for global energy-demand growth by 2040, according to the International Energy Agency. While the world's second largest economy still features the fastest pace of growth when it comes to oil demand a shift to a more service-based Chinese economy, along with higher energy efficiency, will turn the tables over the coming decades, according to Keisuke Sadamori, director of the IEA's energy markets and security division. "[Demand] continues to shift further east to Asia. China was the main engine of energy demand over the past decade, and its demand growth will still outpace almost all countries until 2040, but its role as the main engine of global energy demand growth will be taken by India," Sadamori said Tuesday at the International Petroleum Week in London. [Future of Oil-Demand](#)

ECONOMICS

How China's One-Child Policy Led to Forced Abortions, 30 Million Bachelors. Journalist Mei Fong explores the wide-ranging impact of what she calls the world's "most radical experiment" in her new book, *One Child*. She says that among the policy's unintended consequences is an acute gender imbalance. Fong says. "Now China has 30 million more men than women, 30 million bachelors who cannot find brides. ... They are the biological dead ends of their family." Looking ahead, China is also facing a shortage of workers who can support its aging population. Currently China has a dependency ratio of about five working adults to support one retiree. That's pretty good, a very healthy ratio ... for now. In about 20 years that's going to jump to about 1.6 working adults to support one retiree. [Effects of China's One Child Policy](#)

MARINE CORPS SECURITY ENVIRONMENT FORECAST

The ***2015 Marine Corps Security Environment Forecast: Futures 2030-2045*** as announced in [MARADMIN 387/15](#) is open for public release and is available for download at the FAD website. Coming this summer FAD will publish a supplement to the MCSEF. We look forward to bringing that to you.

[Futures Assessment Division](#)



ART OF FUTURE WARFARE PROJECT

The Atlantic Council's Art of Future Warfare Project seeks to cultivate a community of interest in works and ideas arising from the intersection of creativity and expectations about how emerging antagonists, disruptive technologies, and novel warfighting concepts may animate tomorrow's conflicts. Earlier this month, The Project partnered with the FAD to host a Science Fiction Futures Workshop in Quantico, Virginia. Published authors Max Brooks, Charles E. Gannon, and August Cole, worked with 18 talented science fiction writers from across the services, with the goal of bringing to life the future worlds described in the 2015 MCSEF. Follow the hyperlink to Art of Future Warfare Project's website.

[Art of Future Warfare](#)



This newsletter is intended to highlight issues and ideas which may prove significant in the evolving future. In keeping with our focus on both alternative futures and analysis, items in this bulletin will generally be of an alternative nature, or drawn from atypical sources.