At Issue

Lee Goldberg, Editor

Technology has always been a disruptive force that creates new wealth while overturning existing industries and displacing the workers that serve them. On balance, this evolutionary process has created more wealth and more jobs than it's destroyed. However, I've begun to wonder recently whether developments in automation, artificial intelligence, and machine-to-machine communication are leading us towards a "kinder, gentler" robot apocalypse in the form of an economy that can get along perfectly well without us.

A Kinder, Gentler Robot Apocalypse?

The arrival of our robot overlords has been predicted by science fiction writers since about an hour and a half after the 17,468 vacuum tubes in ENIAC's digital computing elements were first powered up in late 1946. Many of their dire scenarios involve an all-out war between humans and machines, as depicted in sci-fi thrillers like *Terminator* and *Caprica*, the prequel to the *Battlestar Galactica* saga.

Another popular variation of human-machine conflict involves a rogue supercomputer that becomes self-aware and decides to take over the world. In *Colossus: The Forbin Project*, for example, the computer that controls the launch of America's nuclear missiles decides the best way to protect the world from annihilation is to team up with its Russian counterpart and use their weapons to impose order on their unruly carbon-based creators.

Other visions of humanity's digital subjugation, like Kurt Vonnegut's first novel *Player Piano*, are less spectacular -- and much more likely. Although it was published in 1952, the book paints an uncomfortably prescient vision of a near-future in which the economy is almost totally mechanized and has no use for human laborers. Vonnegut imagines automation creating a bifurcated society in which the few people who escape a grim, gray existence on a government dole are small groups of managers and engineers whose task it is to keep the machines -- and the companies they serve -- running.

As an optimist by nature and a technologist by choice, I used to dismiss those cautionary tales as paranoid alarmism but, in the last few years, the plight of many formerly middle-class Americans as they struggle to get by in a hollowed-out economy seems too close to the fate of the characters in Vonnegut's imaginary future for comfort.

I'm also unsettled by Elon Musk's recent warnings that, if we're not careful, our civilization may be subsumed by silicon-based AIs of our own creation. His comment, "We are the biological boot-loader for digital super-intelligence," echoes a theory I developed as the result of a conversation I had with Gordon Moore (yes, that Gordon Moore) back in 1997 about the discovery of the transistor. During our chat, he explained that the industry had "gotten lucky" when it chose to work with silicon instead of a dozen-odd other semiconductors because only its unique properties made it possible to fabricate complex integrated circuits comprised of hundreds of millions of transistors. Moore's casual remark "it was almost as if silicon was waiting for us," led me to jokingly speculate about whether the element silicon was actually some sort of simple virus using our carbon-based brains as a host to create ever-more complex versions of itself.

It's been 20 years since that conversation, but I haven't quite been able to get that half-baked thought out of my head. In some ways, it really does appear that, just like a more conventional virus embeds itself within a cell's reproductive system, silicon has embedded itself within the human economy and manipulated it to generate the multi-billion dollar investments needed to create successive generations of the processors, networks, and robots that will eventually be smarter and more adaptive than the beings who created them.

Back then, I wondered if silicon would eventually overwhelm and consume its host in the manner the Ebola virus does, or whether it would somehow achieve a mutually beneficial, symbiotic relationship with us. The inhuman, constantly accelerating pace of life that characterizes the digital economy could be a sign that silicon is pursuing its own agenda without regard for the fate of its hosts. There are also hopeful signs that we may be able to develop a cooperative relationship with our creations. The "Neural Lace" technology, conceived by Musk and his associates at the startup Neuralink, could help bridge the gap between carbon and silicon, creating a path for the co-evolution of our two species.

Are we boldly engineering a new future for ourselves, or are we facing a robot apocalypse in which we've simply designed ourselves out of the techno-economic cycle? Is there another possible future we should consider aiming for? Your thoughts, fears, and dreams are all welcomed when you write me at: lee.goldberg@advantagemedia.com.

PRODUCT DESIGN & DEVELOPMENT
72nd Year, Issue 4

General Manager | TODD BAKER
todd.baker@advantagemedia.com
Editorial Director | JOYCEANN GARIPPA
joyceann.garippa@advantagemedia.com
Editor | LEE GOLDBERG
lee.goldberg@advantagemedia.com
Managing Editor | SHERI KASPRZAK
sheri.kasprzak@advantagemedia.com
Real-Time Digital Reporter | Megan Crouse
Megan.Crouse@advantagemedia.com

Design Engineering Group
SALES & EDITORIAL OFFICE
100 Enterprise Drive, Suite 600, P.O. Box 912
Rockaway, NJ 07866-0912
Phone: 973.920.7000

NICK PINTO
Vice President of Business Development,
nick.pinto@advantagemedia.com
973-920-7746

GLEN SUNDIN
Vice President of Strategic Accounts
glen.sundin@advantagemedia.com
973-920-7038

JOE DEL GROSSO
Regional Director of Sales
joseph.delgrosso@advantagemedia.com
973-920-7192

TIM OWCZARZAK
Regional Director of Sales
Tim.O@advantagemedia.com
973-920-7747

PAT VENEZIA
Regional Director of Sales
Pat.Venezia@advantagemedia.com
973-920-7467

VITO SCARNECCHIA
Regional Director of Sales
Vito.Scarnecchia@advantagemedia.com
973-920-7685

Advantage Business Media

Chief Executive Officer
JIM LONERGAN

Chief Operating Officer/Chief Financial Officer
THERESA FREEBURG

REPRINTS
The YGS Group
800.290.5460
reprints@theygsgroup.com

SUBSCRIPTIONS/CHANGE OF ADDRESS
related matters contact Omeda Customer Service:
847.559.7560; Fax: 847.291.4816
abpdd@omeda.com

LIST RENTALS
Infogroup Targeting Services
Senior Account Manager, **Bart Piccirillo**
402.836.6283; bart.piccirillo@infogroup.com
Senior Account Manager, **Michael Costantino**
402.863.6266; michael.costantino@infogroup.com