

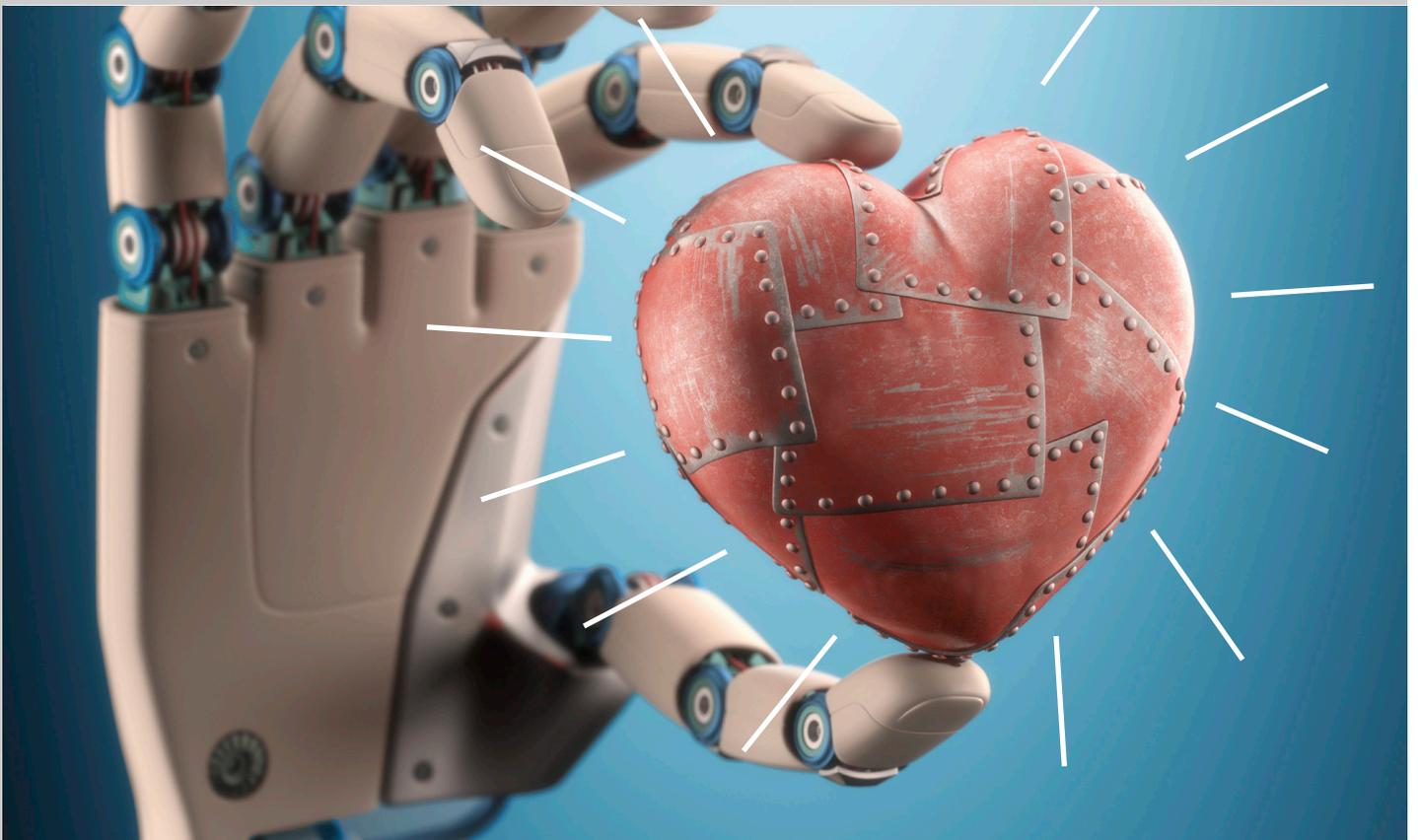
Digital Futures

No. 06

Blending The Best of People and Machines

Humans have always been fascinated with robotics, but legends like Isaac Asimov's code of robot ethics, James Cameron's cyborg assassin, and Marvel Comics' Iron Man have been the stuff of science fiction. That is about to change.

Automation and artificial intelligence will affect every aspect of human life. But the future needn't be a dystopian one. As robots take over increasingly complex tasks, new forms of man-machine interaction will emerge and industry and society will evolve to accommodate a symbiotic relationship.





The robotics market will **grow 9.5% per year to US\$66.9B by 2025**. Military and industrial uses will be 60% of the total. Commercial and personal uses will grow even faster.



The number of Internet of Things sensors will grow from 14.8B in 2015 to 50B by 2020. There will be **200B Internet-connected things in 2030**.



Image and speech recognition technologies are advancing quickly and **could soon equal human abilities**.



Tactile technology is improving rapidly due to research and development in robot-assisted medicine.



The nascent virtual reality market will grow to US\$30B in the next five years, while **augmented reality will be a US\$120B business by 2020**.

[Link to Sources](#)

WE, ROBOT

Converging trends will spur new forms of robotics – flexible, sensory, tactile, intelligent, and interactive – with capabilities far beyond what we envision today.

Robots complement the workforce by crunching numbers, lifting heavy objects, working in dangerous places, moving with precision, and performing repetitive tasks. This leads many people to ask if robots might replace us for all endeavors.

But human advantages include creativity, curiosity, empathy, self-motivation, and the ability to provide multidimensional feedback. Using advanced robotics technology, we can blend the best of people and machines.

WE'VE ALREADY BEGUN

- New York University and the Florida Institute for Human and Machine Cognition are developing exoskeletons for the disabled.
- The U.S. military is developing an “Iron Man” suit that could include super-human strength and respond directly to brain functions.
- A team of researchers at Harvard University have created a “smart suit” that makes its wearer faster, stronger, and more agile.

The Upside of Co-Evolution

Collaboration with robots will spur innovation, growth, and new ways of working. Rather than fear robot takeovers, it's better to:

- Digitize processes ripe for automation. Identify those that benefit from human advantages but might be improved by robot-human collaboration.
- Experiment with robot technologies as they emerge. Consider pilots in production and supply chains.
- Invite employees to propose new ideas. Be open to entirely new robot forms and functions.
- Develop future scenarios based on your unique business model and industry needs.

WORKING WITH THE MACHINES

Advances in speech and image recognition, analytics, and virtual reality will spur robot development along two paths:

A new class of human-machine units with defined autonomy, heightened empathy, and significant artificial intelligence

Artificial human extensions like stronger arms and legs, night vision, and other sensory enhancements

The result? Challenges like colonizing our oceans or space travel will be realized in ways that we could not accomplish alone.