INFERENTIAL FOCUS

*in*FOCUS

*in*F 1618 December 22, 2021

Technology

WHO NEEDS REAL PEOPLE?

Would you like to visit a world where 17 million potential friends are just waiting for you to interact, where musicians connect with audiences and play their requests, where different languages are no longer a limit to communications and where work is no longer a requirement? A world with friendly interactions, musicians corresponding, easy communications and no work may sound magical, but it's a place we are already moving toward as a society via the use of artificial intelligence (AI) software and robots. Current capabilities are stunning, and more are coming. Technological advancements, including deep learning and natural language processing (NLP), are leading to this world, where friends, entertainers and employees can be created and programmed to serve myriad purposes, moving automation and robotics into fields and aspects of social life that have heretofore been dominated by humans. While the move to workforce automation has been ongoing for some time, these amazing advancements are leading to a new world of possibilities, where the question for individuals, employers and marketers may soon become "Who needs real people?"

TAKEAWAYS

- Advances in artificial intelligence (AI) are leading to the creation and popularity of virtual characters. They are here today.
- Virtual characters are being used as friends, entertainers and replacements for human labor.
- AI advancements are enabling the creation of software-generated art and entertainment, which may eventually prove to be competition for human-led endeavors.
- Current labor shortages are inducing companies to invest more money in artificial intelligence, automation and robotics.
- The distinctions between "real" and "virtual" are disappearing very quickly.
- The realities of new and existing automated capabilities will stun and surprise many investors, managers, marketers and employees.

IMPLICATIONS

- Businesses providing robots and automation software will continue to benefit in the long term.
- AI and automation will negatively impact jobs, including those in agriculture, healthcare, design and the physical arts, that have previously been seen as safe from machine usurpation.
- Business efficiency, productivity and earnings will increase as technology becomes increasingly utilized.
- Workers will need to rethink career choices and earning possibilities after automation substantially reduces the size of the needed workforce.
- Programs to retrain human employees will need to be ramped up.
- Regulation will be slow to keep up with all these changes.
- For businesses, the momentum of capital expenditures rather than labor expenditures is on the verge of accelerating.

A Different "Friend" Experience

The CBS reality show *Love Island* brings single people together on a tropical island with the promise of a chance to find romance (and win money). On a different island, called Xiaoice Island, there is no competition, and anyone can find companionship, if not love. With more than 17 million virtual "girlfriends" and "boyfriends" to choose from, Xiaoice Island offers visitors many potential mates, and those mates are not picky at all. This virtual "island" currently exists on a social network that was created and developed by the Beijing-based Microsoft spinoff Xiaoice. The virtual space, which will soon be accessible via an app, allows users to create their own AI friends or lovers and to interact with these virtual characters in an immersive environment. On Xiaoice Island, each AI-based being has a different background and a unique personality, face and voice. According to the company, the characters are emotionally intelligent (*i.e.*, they can respond to recognized emotions) and capable of chatting with users and telling stories. Users can also train and develop their own AI bots on Xiaoice Island and invest them with different talents for art, mathematics, content creation or science. According to the CEO of Xiaoice, Li Di, "On the island, each AI being was designed to comfort users with empathetic conversations that cater to their emotional need." Last year, when Xiaoice partnered with Huawei on a public test of its "virtual boyfriend" functionality, 1.18 million users in China signed up in the first week. (*Pingwest*, 9/23/21; *China Daily*, 10/22/21; *inf.news*, 12/2/21)

"Do not interfere, Helen. This is between me and my avatar!"

Xiaoice isn't the only company offering AI-driven friends. Replika, created in March 2017 by the San Francisco AI start-up Luka Inc., offers a chatbot app that generates personalized AI companions based on a user's personality. Users first can choose whether their chatbot is a friend, lover or mentor and then can pick its name and gender as well as its hair and eye color. Users have the ability to communicate with their chatbot via both text and voice, and the more a user communicates with the virtual character, the more the virtual character learns and becomes compatible with its user. In the Google Play store, the Replika app has been downloaded more than eight million times. (*Los Angeles Times*, 11/29/21)

The New Entertainers

On the Xiaoice virtual island, characters do more than just try to accompany and comfort lonely humans. Using artificial intelligence, the company has "trained" its virtual beings to produce intellectual property (IP) such as poems, paintings and composed music. That IP could eventually be valuable.

• In 2018, artwork created by computer algorithms, developed by French AI company Obvious, was sold in a Christie's auction for $432,500. (*China Daily*, 10/22/21)

While Xiaoice's virtual artists and entertainers will initially be creating art solely for their users instead of for commercial purposes, they can possibly dream (*if* they can dream) of one day performing for big audiences at large festivals like Coachella. Impossible, you say?

• Hatsune Miku would disagree. **Miku is a Japanese pop star avatar that already sells out arenas** for "her" concerts in Japan and was slated to perform as a hologram at last year's Coachella before the event was canceled because of COVID-19. (*Billboard*, 6/29/21)

The market for these kinds of virtual entertainers is growing.

• Over the past year, 32,412 virtual hosts have performed on Bilibili, a popular Chinese short-video platform, a 40 percent year-over-year increase. These virtual characters on Bilibili play games, dance, sing, paint, chat and interact with fans. (*China Daily*, 10/22/21)

Part of the appeal of virtual entertainers is that interaction with them can be more expansive than with traditional artists and entertainers. For example, Authentic Artists creates virtual artists and then lets fans influence how its artists perform during concerts on Twitch. The virtual musicians respond to audience feedback, whether by increasing the intensity of a song, decreasing the tempo or fast-forwarding to the next song. The watch

times for these Authentic Artist virtual performances now average more than 30 minutes each. (*TechCrunch*, 4/7/21; *Billboard*, 6/29/21)

Fans can also follow virtual entertainers as they would traditional celebrities.

• FN Meka is a virtual avatar that performs music created by artificial intelligence. The "artist" has released three official singles and has 9.8 million followers on TikTok.

• Miquela Sousa is a "nineteen-year-old Brazilian-American" model/pop star avatar that goes by the moniker Lil Miquela. Lil Miquela's vocals blend real singers' voices with computer-generated sounds. "She" has 250,000 monthly listeners on Spotify, three million followers on both Instagram and TikTok and endorsement deals with Calvin Klein and Prada.

(*Billboard*, 6/29/21; *Fast Company*, 10/5/21)

Lil Miquela was created by a studio called Brud, which specializes in creating virtual personalities. The growing popularity of virtual characters, artists, influencers and models has led a number of other agencies and record labels to create and promote virtual celebrities.

• Warner Music Group has invested in Spirit Bomb, a record label that creates virtual musical acts. The music performed by these avatars is created with or by human musicians and producers.

• Factory News is a record label that is both creating its own virtual artists and signing virtual artists created by others.

• The Diigitals has been described as the world's first modeling agency for virtual celebrities. Its website currently showcases seven digital models that can be used in marketing campaigns.

(*Rolling Stone*, 10/15/20; *Billboard*, 6/29/21; *Music Business Worldwide*, 9/9/21; *Fast Company*, 10/5/21)

Nonhuman Employees, Part I: We Have AI

Beyond its virtual friends and entertainers, the Xiaoice platform started offering chatbots in 2014. It now provides voice-activated virtual assistants in more than one billion individual smart hardware devices, including smartphones and smart speakers, through partnerships with Xiaomi, Oppo, Vivo, BMW, electric-carmaker NIO and other companies. While chatbots like those from Xiaoice, Amazon, Google and others have been utilized for some time, companies are now using AI software that works in ways similar to deepfake technology to create AI-voiced characters, sometimes combined with real people's likenesses. Hour One is a start-up that hires people willing to sell the use of their likeness for money. The company uses a high-resolution camera to film a person talking and making different facial expressions in front of a green screen. It then plugs that footage into AI software and uses text-to-speech software, which allows the firm to generate video of a person saying whatever it wants, in any language. Hour One currently has more than 100 AI-voiced characters that appear in marketing and educational videos for organizations around the world. The company has 40 clients, including those in the healthcare, e-commerce, real estate and entertainment fields. Separately, Alice Receptionist uses similar technology to provide firms with an on-screen avatar in the user's office lobby "who" is able to handle visitors' queries and replace a human receptionist. (*China Daily*, 10/22/21; *MIT Technology Review*, 8/27/21)

Advances in deep-learning technology have made it possible for voice developers to no longer need to dictate the exact pacing, pronunciation or intonation of computer-generated speech. Instead, hours of audio can be fed into an algorithm that learns speech patterns on its own and then alters the speech accordingly. Companies also no longer need to hire different voice actors to speak different languages for different markets, as some voice-AI firms can manipulate accents or switch the language spoken by a single voice. This is allowing numerous companies to offer characters or avatars, along with voice technology, to replace human workers.

• Unreal Engine, developed by Epic Games (creator of Fortnite), is offering a free cloud-based app called MetaHuman Creator that empowers anyone **to create**

"Oh, I'm sorry. You're both holograms – I assumed you knew each other."

photorealistic digital humans in minutes, compared to the weeks it took previously.

• WellSaid Labs specializes in offering digital voice actors for corporate e-learning videos.

• Remeble.ai designs voices for ads and smart assistants. The company says it is already working with clients to launch personalized audio ads on Spotify and Pandora.

• Sonantic is a company specializing in emotive voices that can laugh, cry, whisper and shout. The company works with video-game makers and animation studios to supply the voice-overs for animated characters. (*VentureBeat*, 2/10/21; *MIT Technology Review*, 7/9/21 and 8/27/21)

Nonhuman Employees, Part II: We Have Robots

Advancements in artificial intelligence are leading to the possibility of replacing humans in numerous capacities, including as friends, lovers, entertainers, managers, advertising icons and actors. As we wrote in a recent *Briefing*, the current labor shortage is also enticing businesses to invest in and deploy automation software and robotics as a way of replacing humans as employees. One example of that is Nissan's new "intelligent factory" in Japan, which will have very few human workers. In these factories, robots do the work, including welding, mounting and paint jobs, as well as the inspection of those paint jobs. The human workers at the factory are there only to analyze data collected by the robots and to maintain the equipment. Nissan plans to roll out these factories worldwide. (**IF 4221**; *Associated Press*, 10/8/21)

Robots with new capabilities are being used in many different fields. Consider **these few** examples:

• Carbon Robotics offers a farming robot that surveys fields, identifies weeds and uses a laser flash to kill the weeds. The technology, which can kill 100,000 weeds per hour, has a break-even cost after three to five growing seasons.

• Hanson Robotics is selling Grace, a humanoid robot for healthcare. Designed as an assistant for doctors, Grace is equipped with sensors, including a thermal camera to detect a patient's temperature and pulse. Grace can speak English, Mandarin and Cantonese, and can socialize – and, the company claims, can conduct talk therapy.

• The company Canvas has created an artificial intelligence robot that can install drywall at a construction site faster than humans (with no required disability insurance); this robot has already been used at the Chase Center in San Francisco as well as at a terminal at that city's airport.

• Built Robots provides construction sites with autonomous machines that work as diggers and dozers.

• Geek+ specializes in software and robotics for warehouses, offering goods-to-person and bin-to-person picking solutions. Its autonomous mobile robots transfer items from inventory to work stations. Geek+ also runs a smart factory, **using a robot arm to produce other robots.**

• Merrow Manufacturing in Fall River (MA) built a fully automated 30,000-square-foot cutting-room floor to produce medical scrubs. The new facility produces **15 times** as many scrubs as the company did before becoming fully automated.

(*Ars Technica*, 11/22/20; *Fast Company*, 6/21 and 9/1/21; *CNN*, 8/19/21; *New York Times*, 11/24/21)

In November, the artificial intelligence company OpenAI significantly expanded public access to GPT-3, one of the world's most advanced natural language processing (NLP) models. Using these NLP tools will allow people to create virtual characters able to generate their own essays, emails, fictional stories and more. This will open the door to more AI-generated art, more well-rounded virtual characters to interact with, more AI-enabled labor and more questions. Who needs a dating service when you can find satisfying virtual companionship online? Why do marketers need to hire a celebrity endorser when they can create a virtual one? Who needs to hire a voice actor when AI can provide the same voice-over services less expensively? Why hire a farmer, drywaller or factory worker when a robot can do the same job more efficiently? What will sustain the consumer economy in the midst of a fully automated economy? As a society, we need to be ready to answer these questions as we determine Who Needs Real People. The capabilities are already here.