



by kenneth r. hanson

In Berlin, a group of sex tech entrepreneurs created Cybrothel, a futuristic sex doll brothel offering clients the opportunity to have sex with dolls that appear to speak, listen, and react, as though they were artificially intelligent. In the U.S., CEO of Abyss Creations and Realbotix Matt McMullen has been building some of the most sophisticated robots and sex dolls for more than two decades in San Marcos, California. Sex dolls have been featured in Hollywood films, Netflix comedy specials, VICE documentaries, and even a T-Pain music video. For many people, sex dolls are a joke. Amazon, for instance, advertises them as “gag gifts for adults” and “for Halloween, Bachelor and Hen Parties.” For some scholars, their hyperreal design and sexualized features are another example of the adult industry’s misogyny.

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For investors, however, sex dolls are among numerous ways to enter a \$34 billion-dollar sex tech market. Innovations in sex toy design, sexual health and wellness devices, virtual reality pornography, simulated sex video games, and other inventions are attractive to venture capitalists looking to fund the startup behind the next “big thing” in sex tech. It seems that, like everything else in the 21st century, sex is getting an upgrade.

Material, technological, and social factors have long shaped the history of sex toys. Anthropologists have unearthed stone dildos dating back to 28,000 BCE. Artificial vaginas, some of the first sex toys designed specifically for men, were made of velvet in 17th-century Japan. Historically, men’s sexual pleasure has been viewed as the inevitable outcome of physiology. This is why the vibrator, one of the first sex toys to use electrical mechanization, is one of the most significant developments in sex tech. The meteoric rise and widespread use of vibrators by women in Western countries have been hailed as a victory by pro-sex feminists who fought not just for women’s right to enjoy sex but for popularizing the idea that most women do enjoy sex. Despite the vibrator’s success, the adult industry has continued to privilege heterosexual men’s desires. Today’s feminist pornographers combat this fact in an era of widely available internet pornography. Going forward, grasping the connections between pleasure, desire, and technological development will be instrumental in challenging persistent sexual inequalities. As we advance further into the digital age, what does the future hold for sex?

My ethnographic research in the love and sex doll community, as well as my work in the sex tech industry more generally, offers a cautiously optimistic view of sex’s potential future. I analyze how sex tech entrepreneurs borrow from the Silicon Valley playbook to shed light on how feminism, capitalism, and sexuality are shaping this growing field. Many people working in the industry are critical of how adult entertainment companies have historically catered to cisgender heterosexual men’s desires and wallets. To overturn these trends, they are trying to invent radical options for exploring the boundaries of sexual pleasure. Whether this means designing sex toys for diverse bodies, prioritizing sexual health, or something else entirely, feminist sex tech CEOs want to use their businesses for social good. However, as a capitalist enterprise, the need to generate profit sometimes takes precedence. Simply put, exploitative business models generate the revenue startups need to survive. Is the need to make money an insurmountable barrier within the adult industry, or does sex tech have the potential to uproot the industry’s long-standing inequalities?

### today’s sex tech industry

One of the largest adult industry conventions is hosted by Adult Video Network (usually referred to as, AVN). Alongside the annual award show for pornographic actors, AVN hosts an



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The emotional comfort dolls provide is frequently cited as one of their many benefits, especially by women and queer doll owners.

expo in Las Vegas, Nevada, where adult industry reps showcase the newest inventions. Expo attendees can get pictures with their favorite pornstar, demo a virtual reality headset to watch POV pornography, and hear a robotic sex doll moan. Harmony, one of Abyss Creations’ artificially intelligent sex robots, premiered at AVN in 2020. A headline from the *NY Post*’s coverage of AVN that year reads, “Expect walking, talking, feeling sex dolls coming within ten years.”

The attention Harmony garnered from her debut at AVN renewed debates about whether, and to what extent, sex dolls are another iteration of the adult industry’s misogyny and exploitation of women. Prominent anti-doll scholar-activist Kathleen Richardson has been at the forefront of combatting the development of such technologies. Through her organization, the “Campaign Against Sex Porn Robots,” she has argued that sex dolls encourage men’s patriarchal desire to control and domi-

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nate women. Moreover, because dolls are objects, they further objectify women by equating femininity to passivity and customization for the sake of men. Building on the momentum of her campaign, Richardson has expanded to fighting “deepfakes,” a type of virtual reality that, with shocking realism, digitally alters images and videos by placing one person’s image on top of another image or film. Using deepfake software, tech-savvy DIY pornographers can produce explicit imagery and videos that appear to be anyone—a prominent actor, celebrity, politician, or any other person whose been photographed at some point in their life. The implications of such technologies are disturbing because now anyone’s image could be used to produce explicit imagery without their consent, including children. Accordingly,

one of Richardson's goals is "to offer up an alternative vision of technology where women and girls are centered and valued."

At another adult industry meeting, hosted in Montreal, Québec, academics, entrepreneurs, consumers, and sex workers come together to foster dialogue and opportunities for collaboration while showcasing new inventions made by sex tech startups. The International Congress on Love & Sex with Robots, founded by human-robot interaction scholar David Levy, is generally critical of the adult industry's historical privileging of cisgender heterosexual men's desires. However, attendees at this conference welcome, rather than disparage, sex robots. Each year, several such international conferences are organized by self-described pro-sex feminists working in academia or industry who hope to push the industry into the future. By leveraging technological innovation, these entrepreneurs view sex tech as an opportunity to lessen social inequalities by making sex more pleasurable for everyone. To achieve these goals, the meetings facilitate sessions on attracting investors, opportunities to hear from manufacturers about the latest integration of artificial intelligence and sex dolls, presentations from sex workers working at sex doll brothels, and demonstrations from startup companies developing new sex toys and apps, all aimed at expanding the limits of human sexuality. Interspersed among the (virtual) crowds are self-described feminist sex tech CEOs looking to gain an edge in the booming sex tech market with multi-million-dollar investments, patents, and marketing solutions for innovative designs. With all the excitement and funding surrounding IT, robotics, artificial intelligence, medical technology, audio/visual equipment, and now the Metaverse, sex tech looks more like Silicon Valley every day.

The number of inventions is, frankly, dizzying. Researchers Jenna Owsianik and Ross Dawson at the Future of Sex dedicate

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much of their time to tracking the industry's growth and have categorized developments into five main areas.

One area of innovation is remote sex, which is the application of the "internet of things," like Wi-Fi light switches and refrigerators, to sex toys. Investors see a market for Wi-Fi-enabled sex toys in long-distance relationships and sex work. Researchers examining trends in globalization, migration, and the economy have noted the shifting circumstances of how people form and maintain relationships today. In the future, remote sex devices may provide long-distance couples the tools for more intimate



Dan Cristian P. clure via Pexels

Material, social, and technological factors have long influenced sexual intimacy. What does the digital age hold for the future of sex?

encounters. Evidence that couples might embrace such technologies might be found in the prevalence of sexting. Some research estimates that more than 40% of college students have sent nude images of themselves to partners. If a significant portion of people already use dating apps and smartphones for sexting, the leap to remote sex may not be far off. In the commercial sphere, sex workers are already using remote sex devices. Camming is a form of sex work where sex workers can perform live sex acts from the comfort of their home. As Angela Jones has discussed in her research on the camming industry, cam models often use sex toys in their shows to attract clients. The use of remote sex toys can offer clients a new experience by allowing them to pay for control of the device.

The second area of development is virtual sex. This encompasses how people explore and create sexual content in digital environments. Online games such as *The Sims* and *Second Life* have long included sexuality as part of the gameplay, usually as procreation, but sometimes as explicit content. In *Second Life*, digitized BDSM clubs and fetish garments are created by programmers who sell access to gamers for real money. Adult gaming programmers are working to offer their users the ability to make sexy avatars for exploring sexual scenarios, digital worlds, and in some cases, to create and share explicit content. Other sex-focused websites facilitate

networking for like-minded users, many of whom occupy "thin-markets," or people whose sexual and romantic interests are limited by their marginal social status or niche interests. Social media websites designed for swinging, kinksters, LGBTQ+, racial minorities, and polyamorous people can provide a digital haven for diverse desires.

Immersive entertainment is using new media and technology to produce adult content that engages multiple senses. Advancements in virtual reality have already changed the pornography industry, but other forms of immersive adult

entertainment may have a space in the future of sex work. For example, Cybrothel combines a human sex worker's voice with a personified silicone sex doll to offer clients an "Analog A.I." experience. When clients book a session at Cybrothel, they first sign a consent form and then choose from a list of dolls. Each doll has its own persona, like Kokeshi, the "blue-haired galactic traveler who has come to Earth and found the form of a medical grade silicone pleasure doll." Clients begin their sessions at Cybrothel by entering a room equipped with microphones and cameras connected to an offsite control room where a sex worker can watch and speak to them. Upon entering, the doll is sitting on a bed, and the session begins, usually with a warm greeting from the doll. In reality, though, it is the sex worker talking to the client from the doll's perspective via speakers in the walls. While Cybrothel's owners want to personify their dolls in ways that push back against misogynistic pornographic tropes, they are keenly aware that the market for their service is mostly heterosexual men. The need to pay rent and utilities means that some doll personas have become more stereotypically feminine than the owners initially desired. For now, the legality of sex work poses an obstacle for entrepreneurs looking into similar forms of immersive entertainment. However, the use of dolls and robots may shift our understanding of the risks associated with sex work.

Another area of development is augmentation, which is when manufacturers combine sex tech with medicine and biology to produce new sexual health possibilities. The potential of such technologies to lessen sexual inequalities will depend on how cultural and gendered norms adapt to changing technological means. As research by Krystale Littlejohn shows, since the introduction of the hormonal birth control pill more than 60 years ago, women have been primarily responsible for thinking about and implementing birth control. Period tracking apps help women by setting reminders for taking the pill now, but investors are hoping to back the first company that makes long-lasting birth control options for men. Contraline, for example, is developing a hydrogel implant that will block sperm traveling through the vas deferens. If it works, this will be akin to intrauterine devices (IUDs) for women—highly effective and removable. Carli Sapir, a partner at Amboy Street Ventures, released this statement when her company invested one million dollars in Contraline: "With existing contraceptive options available today, the large burden of pregnancy prevention falls on women. As a contraceptive option for men, Contraline aligns with our commitment to investing in the democratization of sexual health for all genders."

In addition to reimagining contraception, augmentation might also change how we think about sexual pleasure. Wearable biohacking devices could track how frequently, how long, and when we have sex. Medical professionals could use this

data to analyze how sexual activity affects our overall health. Perhaps the future will have a new kind of Fitbit.

Finally, advances in robotics might change not just what people what sex with, but how our sex tech takes care of us. Scholars like Nancy Jecker suggest that artificially intelligent sex robots could be useful for taking care of isolated populations. In highly individuated societies, older adult's disproportionate risk of living alone can have deathly consequences. There are

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already numerous technologies for aiding elders with mobility issues and various security devices for getting help during a crisis. Someday, artificially intelligent robots could call 911, help people get around the house, keep track of medication, and monitor vitals while providing sexual and emotional comfort for people living alone.

Today, the adult industry is larger than ever and poised to continue growing. Debates about sex tech's potential for reproducing, or combatting, gender and sexuality inequality within the adult industry in many ways mirror the feminist sex wars. The repeal of The Comstock Act and subsequent growth of the adult industry in the 1970s motivated questions about what role pornography and sexuality play in gender inequality. Whereas anti-sex feminists criticized how capitalist greed combined with patriarchy to spur a misogynistic and exploitative



Cottonbro via Pexels

Advancements in sex tech include augmentation and biohacking. For example, devices could track how frequently, how long, and when we have sex.



Pavel Daniluk via Pexels

### Advancements in sex tech challenge assumptions about our bodies, gender, sexuality, companionship, and pleasure.

industry, pro-sex feminists saw value in pleasure. They argued for women's right to enjoy their sexuality in whatever way they wanted. Today's sex tech entrepreneurs embrace the pleasurable aspect of pro-sex feminism while incorporating a market-based logic. Not just women, but all individuals, have the right to pleasure, and it is through industry and innovation that those needs can be met. However, it seems something has been lost in all the excitement about sex tech startups. At this juncture, there is little understanding of who uses these technologies and what they mean to users.

#### love and sex doll owners

It is true that one of the main reasons people purchase sex dolls is because of their sexual capabilities. As an inanimate and customizable sex toy, people can swap genital configurations at will, order dolls that meet their ideal desires, and dress them in everything from BDSM gear and fantasy cosplay to the girl-next-door look. As for how pleasurable dolls are, Gilmour described his first sexual encounter with a doll like this, "At the risk of sounding like a freak, which I am, it exceeded my expectations. To a degree that I really can't even articulate." But doll owners insist there is more to this interest than sex. While popular press usually refers to them as "sex dolls," a significant number of today's doll owners prefer "love dolls" as a way of acknowledging the emotional benefits one can receive from owning and taking care of a doll.

My digital ethnographic research on the love and sex doll community between 2020 and 2021 included in-depth interviews with 41 community members and observations of their

online activities. I interviewed owners, spouses, and industry workers while immersed in this transgressive subculture. In exploring a community that talks about the future of sex so much, I found a central tension that drives how people make sense of this practice. Are dolls a sex toy or something more?

Most of the people I met in the doll community were middle-aged or retired men, and almost every person had been in one or more long-term relationships that ended. After their most recent breakup, some people looked back at their relationship history and decided they would rather be single. Gilmour, for example, was always curious about owning a doll but felt it was not a wise choice while he was married and raising children. He said, "It's something I've always wanted to check out. I've been in and out of relationships, I've cohabitated, I've been married twice. Children on the weekends and stuff like that after my divorce with my first wife, but now, I'm in a different situation, a part of my life where it's more feasible." Now that Gilmour's children are older and independent, he lives the life of solitude he always wanted. He still enjoys sex, but a doll allows him to be single. He said, "I actually talked to my second wife about it. I prefer to stay out of relationships and the dating scene, and to be quite honest, if I do want to have sex with a human, I prefer to be with prostitutes." In many ways, Gilmour is a typical doll owner. Not just because he is a heterosexual man who likes being single, but because he sees himself as a man's man. When Gilmour's not online chatting with other doll owners, you might find him tucked away in a smoky Las Vegas casino with friends, betting on sports and ordering drinks.

Belinda Middleweek's research on the love and sex doll

community notes the masculine contours of this transgressive online subculture. The majority of love and sex dolls sold today are anatomically female, and the vast majority of doll owners are men. By my estimate, more than 70% of doll owners are heterosexual men. As such, the doll community is as much a space for people to talk about dolls and sex as it is a forum where men bond with one another over masculine interests via homosocial interactions. But just as the adult industry's focus on heterosexual men's desires has been challenged, so too are the doll community's social dynamics changing. Women and queer doll owners are trying to break into this space because they, too desire a life of solitude.

Blake, who is trans, non-binary, and asexual, decided that purchasing a doll would be easier than trying to find a partner in their thin market. They said, "When I broke up with my last girlfriend, it wasn't good. It's like, one more hit to the heart that was just not good. And I looked at the potential of ever really dating again, and I was like, I don't think I want to do this anymore. I know that having someone around is beneficial, but dating in that capacity, it's really difficult to say to someone, 'Look, I just want to hold hands and hang out, I don't want to have children with you, don't want to get married. But let's be long-term.' Most women are not down for that." Rather than trying to find a partner compatible with their needs Blake hoped a doll could be a companion without risking another "hit to the heart." The emotional comfort dolls provide is frequently cited as one of their many benefits, especially by women and queer doll owners. Shelly, another non-binary doll owner, said, "I call them my synthetic partners, and, well, I have mental illnesses, so they've made me a happier and more well-adjusted person. It sounds strange, but it works for me." AS, a woman who owns multiple anatomically male dolls, also acknowledged the emotional aspect of doll ownership while commenting upon how outsiders view the practice. She said, "I don't see anything wrong with having a doll, but I know it's not viewed as something normal, having an emotional attachment to an inanimate object." The sense that owning a doll is "not normal" is pervasive, which is why doll owners turn to each other with questions about cleaning, repairing, and living with dolls. Fearing friends, family members, and coworkers would judge their decision to forgo human partnerships in favor of synthetic ones, many doll owners are secretive about this aspect of their life. Finding community is essential so that people can recognize and acknowledge each other's needs and life experiences. If sex tech is liberatory, it will need to actively provide solutions that meet diverse needs. But due to the volume of heterosexual men in the doll community, many women and queer doll owners find themselves on the outskirts.

People working at sex tech companies acknowledge that customer demographics affect manufacturing priorities even though they want their products to meet diverse needs. Anthony, a sales rep at a leading sex tech manufacturer, spoke of their dolls and said, "When it comes to dolls, the majority [of customers] is probably people in their 40s to 70s, cis white men ... and,

you know what, there's probably more female customers buying female dolls than female customers buying male dolls. And I don't think that's necessarily a sexuality-based thing, either. I think that's more based on our selection. Because a lot of customers, when it comes to our male dolls, have this complaint that the male dolls basically look the same. But we have a male AI head coming out, so once that is launched, that might have something of an effect on our sales ratios." For now, major sex tech companies such as the one Anthony works for are bound by profit. So while feminist movers and shakers in the sex tech industry want to push the adult industry beyond its historical focus on men, competing with an already profitable business model is difficult.

Culturally, our response to technology is usually one of fear. Like other aspects of our lives, sexuality has and will continue to be, shaped by technological developments. Some people resist the inroads technology has made in sex because of its potential misuse. In contrast, others are hopeful that sex tech will challenge assumptions about our bodies, gender, sexuality, companionship, and pleasure. How the industry moves forward will be influenced by competing visions among feminists, capitalists, and academics. For now, the focus on heterosexual men's desires is still one of the most profitable models in the sex tech industry. But history has shown us how effective feminist organizing can be in challenging ideas about pleasure. As more of our social world goes online, we are primed for a reimagining of sexuality; perhaps the connections people make based on shared interests will become the driving social force behind sexuality in the digital age.

### recommended resources

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