

MODERN FITNESS TECHNOLOGY

Its Impact on Consumers and Athletes



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MODERN FITNESS TECHNOLOGY

Its Impact on Consumers and Athletes

Few examples better demonstrate how quickly technology evolves than the role of technology in fitness. Perhaps the quintessential piece of in-home fitness equipment, the treadmill, owes at least part of its popularity to technology. The Washington Post noted how the addition of [music, television, and eventually WiFi](#) to exercise equipment during the 1990s and 2000s was revolutionary. It captured consumers' attention, and since that point, it's hard to imagine a treadmill model without at least some built-in technology for entertainment.

Another major trend in fitness technology, wearable technology, is even newer. The most notable example are products from Fitbit, and the company didn't release its first activity tracker until 2009. That's near the time when Wii Fit was out, and that game, in a similar way, revolutionized its fitness trend, exergaming ("exercise" and "gaming").

Those products are ancient history, relatively speaking, as the technology in fitness products that have been on the market for the past few years far exceed the capabilities of their predecessors. You can look at newer products — treadmills with heart rate monitors and video, activity trackers that document sleep patterns and calories burned, and video games with strength training and balance activities — and see just how far everything has come in approximately 10 years. And an even newer generation of equipment and accessories is arriving soon.

The impact is felt from the most casual audiences all the way up to professional athletes. Modern technology's presence is felt across in-home devices and wearable technology. Take a look at how audiences are taking advantage of technology to meet their fitness and athletic goals.

IN-HOME FITNESS TECHNOLOGY

In-home fitness will never be the same. No longer are Wii gaming and TV-connected treadmills on the cutting edge of fitness technology. Consumers' homes are starting to welcome products that are on a new level of innovative and engaging.

THE RISE OF EXERGAMING

Another huge fitness trend that targets home consumers is exergaming. It combines exercise and gaming, and it has a lot of potential to utilize advanced technology.

Exergaming came into the arena at around the turn of the century. That's when the arcade game, Dance Dance Revolution, became popular. Around 10 years later, the Wii became a hit, and its movement-detecting controller showcased the console's knack for exergaming. Of special note is the Wii Fit game, which features yoga, strength training, aerobics, and balance games. According to Nintendo at the time of publishing this guide, Wii Fit is one of the console's top-selling games at more than [28 million](#) units.

The exergaming market has witnessed a number of popular games and technologies over the years. Consoles like the Wii and Xbox's Kinect-enabled consoles (Kinect is a motion capture system) have helped bring dance titles like Dance Dance Revolution and Just Dance to home users. Developers have also taken advantage of mobile technology to create exergaming titles. For instance, in 2012 the immersive running game Zombies, Run! was released. It features missions with audio narrations and the ability to virtually collect supplies to survive a zombie apocalypse. Players must run faster at certain times to avoid being captured by zombies.

Those examples are quite outdated compared with the fitness technology found in some exergames. Perhaps the most notable trend in cutting-edge technology for exergames is virtual reality (VR). VR offers gamers a truly immersive experience with integrated physical movements to ensure a real workout.

That's certainly the case for first-person boxing games, a popular subsection of VR gaming. Two titles, Knockout League and Thrill of the Fight, offer arcade- and simulation-like experiences to gamers. They support moving and dodging to avoid blows, and realistic punching mechanisms for offensive movements. According to the Virtual Reality Institute of Health and Exercise, an independent [research and ratings](#) organization, both games burn

approximately 8-10 calories per minute, which is the exercise equivalent of rowing. In other words, modern VR exergaming titles aren't your average video games. Technology has upped the ante on what level of physical exercise certain games can provide. No longer is Wii Fit the baseline; gamers and your everyday consumer can get a full workout by playing a game.

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Expect even more things for the future. According to independent news publication Road to VR, a new locomotion accessory named Cybershoes earned more than [\\$240,000](#) worth of funding through its Kickstarter campaign. The device fits onto users' shoes in order to track movement and require physical action. It's a simpler method than another noteworthy example of technology in gaming, VR treadmills. Brands have created VR treadmills that actually require gamers to walk and run to move in the game. Whether that's adopted on any wide scale has yet to be seen, but VR treadmills and other equipment represent just a taste of what the future may have to offer in exergaming.

As long as qualified fitness personnel are involved, research on exergaming has revealed potential health benefits, in particular, for adolescents. A study in *Pediatric Obesity* found how previous trials that simply provided children with exergaming didn't alter participants' overweight or physical activity levels. However, when support is provided, participants can have those positive health effects. The intervention in the study integrated social support through a gaming curriculum, a step tracker, and regular video chats with a fitness coach. That group improved their blood pressure, cholesterol, and physical activity levels, and children's ratings of [acceptability and enjoyment](#) were high. A separate study in *Pediatric Obesity* found obese adolescent girls who used dance exergaming for exercise training [reduced their body fat](#) and bone

mineral density. That intervention used “game coaches” who encouraged the girls’ participation and motivated them to exercise at a high level.

Only 27% of adolescents achieve 60 minutes of daily moderate-to-vigorous physical activity as recommended by the Physical Activity Guidelines for Americans. A review of exergaming for children and adolescents in the Journal of Clinical Medicine concluded that it can potentially improve health by increasing physical activity. However, exergaming is [frequently underexploited](#). It noted how further developments, like customized programs, are needed to reap optimal benefits of this relatively new technology.

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PHYSICAL ACTIVITY GUIDELINES FOR AMERICANS BY THE CDC

Aside from promoting exercise, other potential applications exist for exergaming. As an update on the state of exergaming in Today’s Dietician noted, studies [indicate promise](#) for exergaming for the elderly, individuals with physical disabilities, and in clinical applications like poststroke recovery, physical therapy/rehabilitation, pain relief, and depression.

INNOVATIVE FITNESS PRODUCTS

PELOTON’S EXERCISE BIKE AND TREADMILL

Perhaps the most notable example of innovation for in-home fitness technology comes from the fitness brand Peloton. According to CNBC, Peloton was worth more than [\\$4 billion](#) as of February 2019, and has been named the “Apple of fitness.” It’s an appropriate term, given how it has transformed what home users can experience during exercise.

It all started with the brand's indoor exercise bike. The major draw is that the device provides home users with 24-hour access to live and on-demand group workout classes. Classes vary in length, type, and difficulty, and they feature top New York City instructors. Additionally, in the spirit of virtually any piece of modern fitness technology, home users receive live, in-class data metrics that span cadence, resistance, output, and heart rate.

What makes the device so special? One industry analyst told CNBC that Peloton built instructors into their brand, "achieving a sort of cult status." "We've also built a socially engaging platform in the workouts themselves," instructor Robin Arzon, who is also an ultramarathon runner and author, added. "So, whether you're getting a high-five from a fellow rider or you're getting a shout-out on your first run . . . there's an intimacy there that doesn't exist most places, certainly not in a space where you're interacting digitally.

"Instructors are kind of breaking that fourth wall and [are] in people's homes," Arzon said. "That's really powerful stuff." By providing its riders with motivation and accountability, Peloton's users can stay on track with their fitness programs.

Peloton didn't stop there. Building off the success of its interactive exercise bike, it applied innovation to the treadmill. Like the bike, the treadmill features an HD touchscreen and live and on-demand classes from top instructors.

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ROBIN ARZON IN CNBC

OTHER STREAMING FITNESS OPTIONS

Since Peloton introduced live and on-demand fitness classes to home users, similar products and concepts have followed. There are other competitors that sell interactive exercise bikes and treadmills, but what's most notable is how other in-home fitness devices have assumed the same mindset.

Look no further than Mirror. That's the name of the startup and the product, and at first glance, it simply looks like a mirror. However, take a closer look at the Mirror, and you'll see that it has an LCD screen that streams fitness classes. According to Business Insider, customers use an app to enter in their key health details, connect to the machine using a Bluetooth heart rate monitor, and [begin the workout](#).

The Mirror represents a sleek piece of household furniture and a cutting-edge piece of fitness technology all in one. When it's turned off, the item functions like a mirror. When it's on, the Mirror has a slight reflective quality so users can monitor their form while working out. The instructor is also viewable, of course, on the screen, and the product has a built-in sound system. Everything is controlled via the app.

As you might expect, the draw for Mirror is similar to what Peloton accomplished for indoor cycling. "Studio classes are great for high-quality, hands-on training but are often draining on time and budget," Brynn Putnam, who founded Mirror and was once a professional dancer for the New York City Ballet, told Business Insider. "We're creating a personalized experience with the best trainers and classes around the world, so anyone can enjoy the benefits of a workout, whenever and wherever they want."

The "Peloton approach" to fitness extends to virtually any other area of fitness. Other companies are offering subscriptions for consumers to work out. Some offer general fitness classes, others specialize in niches like high-intensity interval training, yoga, strength training, and martial arts. There are even companies that focus on providing a workout for the mind, so to speak, with meditation studios offering live group meditation classes. As TechCrunch described of one company, it's "[Peloton for meditation](#)."

WEARABLE TECHNOLOGY: TARGETING CONSUMERS AND ATHLETES

Another major trend in fitness technology is wearable technology. In fact, it's the top fitness trend for 2019, according to [a survey](#) from the American College of Sports Medicine (ACSM).

The “why” behind it all is rather straightforward. “Technology is a must-have in our daily lives, and wearable tech can be an invaluable tool for those looking to get and stay physically active,” the survey’s lead author said. “We can easily monitor heart rate, count steps, track calories, and create plans. The data collected by wearable technology can be used to inform the user and their health care team about important daily health metrics like physical activity, and it encourages healthier lifestyle choices.”

How wearable technology impacts consumers and athletes is quite different, however. The following sections examine some important features of each market.

WEARABLES AND CONSUMERS

Wearable technology impacted the fitness world in the 21st century. Wearables existed prior to that time, but not in any modern understanding of the term, and it wasn't often used in fitness. For instance, helmet-mounted camcorders existed in the 1980s and '90s to give audiences a first-person perspective when watching VHS videos.

The major breakthroughs came in 2006 and 2009, when Nike and Fitbit released fitness tracking devices. The Nike+iPod kit came first, and allowed consumers to place a sensor in their shoe that communicated with the Apple iPod. Information such as distance traveled, pace, calories burned, and elapsed time of the workout could be tracked. Fitbit's device worked in a similar manner, but attached to the user's belt. It used an accelerometer to measure steps taken.

What Fitbit did with wearable activity trackers revolutionized the industry. They've developed innovative products that have defined the market. For instance, by 2013, the company made the critical step to consumers' wrists, with their Flex and Force products.

Most fitness trackers today are smartwatches. One popular example is the Apple Watch, which can differentiate between movement and actual exercise. The device uses that technology to encourage users to stand more throughout the day. On the watch's main display, users can easily see how

much they've moved, exercised, and stood, as this data is provided in a graphical form of three rings. Scrolling down in the app offers an hour-by-hour breakdown of activity.

The ability to distinguish between movement and actual exercise is just one of many innovative features found in fitness trackers. Products can use recorded metrics to estimate how much energy users have left for certain exercises, integrate GPS capabilities for running and cycling sessions, and include advanced sleep monitoring statistics.

The overall impact to consumers is often regarded as positive. Thanks to wearable devices, everyday people have access to data that can help them visualize and interact with their fitness regimens. That information can be especially helpful for fitness coaches and instructors who are helping people reach their fitness goals. Another benefit to wearables is that there are gamification elements that encourage people to stay active and connect to their friends and family.

Some research has found that wearables can potentially change physical activity and sedentary behavior. In *Cancer*, a journal from the American Cancer Society, authors of a study remarked that “given their low cost and wide reach, wearables are [ideal tools](#) for scalable health promotion programs.” The study demonstrated how wearables can specifically benefit cancer survivors, facilitating more active lifestyles.

Note that research on wearables is in its infancy. There may be drawbacks to wearables in fitness, as an editorial in *Popular Science* [outlined](#). Consumers who may not have the assistance of a professional can develop perceived health complaints due to an abundance of health data without the proper awareness of its application or significance. Another potential issue may be that the fixation on wearable data can cause anxiety or, due to getting off-track on one's workout goals, undermine motivation for exercise.

WEARABLES AND ATHLETES

Like wearables for consumers, athletes benefit by receiving a wealth of data about their performance. However, as you can imagine, the application is taken up several notches. As a result, fitness technology is transforming amateur, collegiate, and professional athletics.

Companies in this market are providing coaches with valuable data. One company, StatSport, uses a vest to capture data that is sent to software to analyze training and game-day information. For a sport like football, metrics include number of collisions, total distance covered, and distance at high

speed. Performance is a prime objective of the technology for sports teams, but injury is important as well, as Eric Waters, current head athletic trainer for the Utah Jazz, [said](#) on StatSports' website.

With StatSports Viper we are able to see so much information during practices that help us understand just what kinds of physical demands our players are under. In so many cases, we see that their demands are too high and we have seen a definite reduction in stress and fatigue type injury when we can alter their time on the floor. Additionally, we can see who may need extra work based on who looks fatigued, objectively, with the data we collect.

Technology has actually paid off in terms of fewer injuries. In 2013-14, the Toronto Raptors became the National Basketball Association's (NBA) least injured team, one year after introducing a device from Catapult Sports. Fast Company detailed how the Raptors [received data](#) from the device's gyroscope and accelerometer about how its players move, such as accelerations, decelerations, elevations, and jumping ranges. The team could detect if players were, for instance, using one leg when jumping, which might stem from an old injury. Using that data could then be used to build individualized training plans to account for physiological imbalances.

According to Alex McKechnie, director of sports science and an assistant coach for the Raptors, simple shooting drills revealed insights using the technology. "A guy jacking up shot after shot after shot – once you start to look at the jump patterns and the loads, we find that most of that workout is at the medium intensity level because of the deceleration patterns from the jumping," he said. "Translation: What was supposed to be a low-stress workout turned out to have an unnecessarily heavy impact," according to Fast Company. "So the team adjusted."

A more recent example from the NBA comes from Kinexon, a company that claims to have [played a role](#) in the Philadelphia 76ers' rebuilding process. The team's director of performance research and development, David Martin, has used wearables to capture data that helps with player development. For instance, performance tools enable the team to manage stress and strain throughout the season, and player profiles can be used for reference for future rehabilitation situations. Related decisions can be made in-game, by monitoring minutes played by the team's star players. Martin presented at the 2018 MIT Sloan Sports Analytics Conference, offering some insight into how wearables can impact the NBA. Roughly [half](#) of NBA teams use Kinexon's technology, according to the company.

PREPARING FOR THE FUTURE OF FITNESS

The future of fitness may already be here for in-home equipment like Peloton devices, the Mirror and, thanks to VR technology, exergaming. Fitness trackers, perhaps the least advanced of all technology segments outlined in this guide, may have plenty of room for innovation. As the website Wareable speculated, wearable technology [could incorporate](#) flexible technology with thinner screens that can bend with users' bodies. Other features in the future might include a way to tackle sleep apnea and monitor glucose, blood pressure, and hydration.

An important key is that even the most cutting-edge fitness technology requires guidance from qualified professionals to reap optimum benefits. You can learn how to impact others' fitness goals in the general population or in competitive environments with an online [MS in Exercise Science](#), which emphasizes hands-on application and provides a strong foundation in exercise physiology, sports nutrition, and sports psychology. Aurora University's program offers two specializations in sports performance and clinical exercise, and through additional coursework and an internship or capstone experience, you'll be prepared for either of the following industry-leading certification exams:

- The American College of Sports Medicine's (ACSM) Clinical Exercise Physiologist (CEP) exam
- The National Strength and Conditioning Association's (NSCA) Certified Strength and Conditioning Specialist (CSCS) exam.

All courses in the degree feature expert instructors with extensive experience in their fields.



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