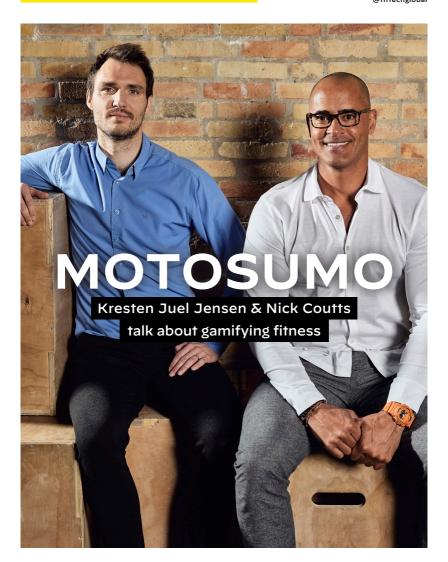
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Embracing digital

We're in the middle of a change so vast we still can't see the shape of it. The only definites are that achieving good health will become a new and urgent priority and technology will be a major driver of this, as the fitness industry embraces digital



it tech has become a tool of hope since the beginning of the coronavirus lockdown, offering health and fitness operators and professionals a fighting chance to save their businesses.

The adrenaline and urgency of the moment have driven the industry to fast track change. We estimate the COVID-19 emergency has accelerated the adoption of technology in the fitness industry by at least a decade in the space of just a few weeks.

fitNdata calculates that 65 per cent of the world's gyms have been closed at some point during the pandemic, locking 230 millions members out of their clubs.

The impact of this displacement on the sector has been nothing less than revolutionary, with people in lockdown pining for their exercise fix and health and fitness operators and exercise professionals turning to technology to connect.

Live streaming and on-demand content have exploded to the point where every major gym operator now has a digital offering – many of them developed and launched within a matter of days, showing the huge resourcefulness and energy of the sector.

Deals have been done between competitors, collaborations have yielded new products and an array of new tech set-ups are being used to stay in touch with customers, monetise services, deliver remote and streaming workouts and keep companies and people in business.

The world has changed. The new future will be based on tech in a way that wouldn't have seemed possible even a few weeks ago.

Now operators and fitpros have tasted the power of tech, there's no going back. We



The COVID-19 emergency has accelerated the adoption of fitness technology by a decade

expect the pivot to digital to continue, for tech to be refined and to bed down to be part of the infrastructure of the industry in a symbiotic relationship with gyms.

The pandemic has drawn the attention of everyone – including governments and corporations – to the fundamental importance of good health, as it emerges this is a major determinant when it comes to COVID-19 survival rates and outcomes.

When the storm has passed and we're able to reflect on what has happened, it will become clear that being fit must be given far higher priority on a lifelong basis and we expect fitness technology to be one of the major drivers of this revolution to come.

Liz Terry, editor, FitTech @elizterry

FIT TECH ISSUE 1 2020









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Tech Talk: What's the future of home fitness?

The coronavirus pandemic has seen the fitness industry pivot to digital. We look at the longerterm implications

Interview: John Foley, Peloton
The founder and CEO talks about his journey







Get connected Sony's Henrik Bengtsson explains the company's

collaboration with Precor on an innovative new product

Interview: Lauren ← Foundos, FORTË This live-streaming platform brings boutique classes into people's homes. We talk

to its founder and CEO

Inventor: Christopher Ruddock, INCUS

With real-time vibration feedback, this new product generates applied analytics and guides training

Get smart

Peloton is a trailblazer for home fitness

A new smart mask from Unlimitech will capture performance data

Influencer: Krissy Cela

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Opinion: Class action Jean-Michel Fournier envisions the future

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Funxtion has created an immersive group exercise concept

Changing the game Vicon's Dr Kim Duffy

> explains how a new generation of motion capture tech will improve performance

Toni Knowlson. **Amazon Web Services**

Amazon Web Services is changing the sports industry with artificial intelligence

New launch: Lover app

A personalised sexual wellness app has been launched with the aim of improving people's sex lives



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FitTech PEOPLE

Like gaming, it's very addictive, but this time in a good way. Imagine shooting space invaders on a squash court or kicking a soccer ball to kill some monsters

Markos Kern founder & CEO, Fun With Balls

What is Fun With Balls?

We're a startup bringing new forms of exercise and sport to the market. Our systems merge real sports with gaming to create completely new experiences - you're playing games while having a proper workout.

Imagine it like shooting space invaders on a squash court or kicking a soccer ball to kill some monsters. Like gaming, it's very addictive, but this time in a good way.

How did you come up with the concept?

We all struggle with the motivation and discipline to be active but it's incredibly easy to get lost in gaming for hours. So we thought we'd create a new mix of these two worlds to make society more active while having loads of fun. Participation is going down in a lot of sports and many locations are used very little, so our solution hits just the right spot.





Tell us more about your products

We started with interactiveSQUASH - we're upgrading more and more squash courts around the globe and the numbers show a drastic improvement in play time and revenues for our operators, with some centres even breaking the 10 hour per day barrier for months.

With our latest product - MultiBall - we now also offer a simpler system



FitTech PEOPLE



"

If you want to change old, rigid structures, you need to have the balls to disrupt from the ground up!



for any kind of wall in schools, gyms and even hotels and offices.

All our products are very simple to use, they offer a multitude of apps and games and are operated by a simple touch of the wall. We use our own patented sensor system, which detects any object in an instant without cameras. The systems are online 24/7 and are built to last even in the toughest school environments to ensure hours of uninterrupted fun.

Why should the fitness industry embrace tech?

We've never lived in a time where things are changing as rapidly as they are now, and technology will only evolve faster in the future. Normal sports participation is declining rapidly because other things are becoming more and more interesting. especially for younger generations.

It's very simple to see, if we don't embrace this change and find ways for exercise and sport to stay relevant in a digital age, then our future as a species looks very grim.

How can tech be used to attract less active people to fitness?

A recent WHO report found that 28 per cent of adults are not meeting the minimum requirements for physical activity each week. In adolescents this is 80 per cent. It's fair to say that we are already in the midst of a real crisis here and the way we consume digital media is largely to blame for that.

But instead of complaining that "kids should go out and play more", we have to understand what this change in preference really means and how it can be used to our advantage. We know people love games and get lost in them. so let them sweat while doing so.

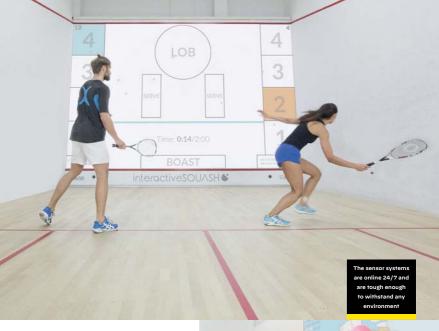
Fun With Balls is a great business name! Would you say fun is the most important aspect of fitness/sport?

Fun definitely is the main aspect and we tend to forget that's why sports started in the first place. With all the competition, federations and rules, it's sometimes good to focus on what's at the core of sports and fitness if you want to attract the masses.

Also, if you're looking at changing these old and rigid structures, you really need to have the balls to disrupt these from the ground up!

What plans do you have for the business?

We're growing rapidly and have big plans. Building our infrastructure more and launching new features is the main mission right now. All signs have been super positive already, but now we have to educate the world on how our systems, especially MultiBall, can be used in so many different ways.



Tech will enable us to create forms of exercise that we can't even imagine today

We're already working with some major brands to create meaningful activation campaigns for sports and we just started on-boarding our first third party developers before launching our App Store, which can then be used on all our systems. We have some more tricks up our sleeves, coming soon.

How do you foresee technology use in the fitness industry progressing over time?

I think technology is still in its very early days in this regard. We have a lot of gimmicks around that don't really

create real change or benefits, and it will be very interesting to see how meaningful tech can change that.

In the end, technology will enable us to create experiences and forms of sports and exercise that most of us can't even imagine today. Meanwhile, the technology itself will become less and less noticeable, compared to the way it's designed and operated today.

Anything else we should know?

What we're building is a completely new category. One of the main elements is education of the existing industry to show the immense potential of this new trend and we very much encourage everybody to be open and look at this change as a great chance to revive and reinvent their business models. •



Our gloves allow users to have digital hands in virtual reality, and to manipulate objects as though they existed in real life

Sri Peruvemba BeBop Sensors: VP of strategy



The gloves can provide feedback on grip and pressure, which could help athletes improve performance

What is the BeBop Sensor technology?

Basically, we connect squishy humans to rigid computers. BeBop Sensor's technology is a super accurate fabric sensor which can measure force. twist, bend, stretch and pressure, as well as provide haptic (touch) feedback in real-time.

With the embedded sensors, our Forte gloves allow users to have digital hands in virtual reality, enabling people to manipulate objects as though they existed in real life. For example, architects can use them to assemble VR models of their buildings and trainee surgeons can use them to perform virtual operations, with the gloves giving feedback on the accuracy of the surgical movements.

Has this technology been used in a health and fitness setting yet?

The good thing with this technology is that it has a lot of applications and the bad thing is also that it has a lot of applications! We've decided to start with a narrow focus - virtual reality and make enough money to explore all the other opportunities in the future

However, we have shipped sensors into a number of medical industry applications, from hospital beds to wheelchairs and sports equipment, such as helmets and shoulder pads.

We see enormous potential for this technology in the sports and health and fitness environment. The fabric is very thin, which means it could be easily incorporated into clothes to



monitor muscles and give feedback on form, which will then improve performance and reduce injury risk.

The gloves can provide feedback on grip and pressure. If you think in terms of high performance athletes, their grip on a bar or free weights can be the difference between a gold medal and nothing. Sensors incorporated into knee pads and clothing could measure form when doing a range of exercises, while shoe in-soles allow smart gait analysis and to work out imbalances which can improve performance and reduce the risk of injury.

Gym equipment manufacturers could also use the technology to give accurate and measureable feedback



What do you predict will happen in the wearables market in the next few years?

According to IDTechEx, the wearable market is predicted to grow rapidly, set to reach \$5bn by 2027. Flexible fabric sensors have emerged as one of the most sought-after sensors in markets which affect consumers every day, including automotive, augmented reality, virtual reality, wearables, health, sports and remote sensing.

The potential for this technology to be used in fitness is huge, says Peruvemba





{ TATTOO BIOMARKERS }

Ali Yetisen

A team at Technical University Munich has come up with technology that can turn tattoos into biomarkers. Lead researcher Ali Yetisen explains his vision of making human skin a diagnostic display...



Ali Vetisen is lead researcher

ith everyone now familiar with wearables, researchers at Technical University Munich (TUM), headed by Ali Yetisen, set up a project to envision how they may look in 20 or 30 years time. The 10-strong team has taken wearables to the next level, by using the skin as a diagnostic display to show real time changes in the body's constitution.

The tattoo uses a dye which changes colour according to changes in the

interstitial fluid, which is a surrogate medium for blood. To date, it works with three elements found in the blood: pH levels, glucose and albumin, a type of protein. This means the tattoo could alert a diabetic patient if they were having a blood sugar spike.

"If the glucose levels are high, the tattoo turns green, and if they are too low it becomes yellow," explains Yetisen. "This could be an effective way of keeping track of health for people with specific health concerns."

The next phase of research will look at electrolytes to show hydration and dehydration levels; this could be applied in the health and fitness industry, particularly for those taking part in endurance sports.

"Minerals such as sodium, potassium and magnesium are critical in monitoring the body's hydration status and this could provide a real time measurement," says Yetisen. "We could also look at lactate and glucose levels and the impact of fructose and caffeine.

"The third phase of our research will look at hormone levels - testosterone, adrenalin, cortisol, all of the stress biomarkers, which can identify fatigue and exhaustion. The opportunities are endless, it is a new concept which no one has really explored."

The tattoos use a dye that changes colour according to changes in levels of three elements found in the blood





If the glucose levels are high, the tattoo turns green; if they're too low it turns yellow

Going forward

One of the challenges of the research was to find the exact viscosity of the dve to prevent diffusion of the tattoo. To do this, the team practised on pig skin, as this is similar to human skin. Long term they plan to develop bioluminescent sensors, which will make the skin glow, to replace the dyes.

It is too early to say whether or not this technology will be embraced by the medical community, as there needs to be more testing on its safety.

"We need to test the cytotoxicity and any reaction, but as the tattoos are based on conventional tattoos I don't think they will be significantly















The research team has been testing the biomarker tattoos on pig skin

different," says Yetisan. "We have received a lot of interest from people who are doing biohacking and those in the quantified self movement."

One other issue is around data protection, since the tattoos could be a very visual measure of a medication condition. One possible way of getting around this is by working in the non-visible infrared range and using a smartphone infrared camera mode to see the tattoo.

It will be interesting to see where this futuristic technology goes. •



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GET ENGAGED

Technogym has launched digital zones and bespoke member service plans. We find out more about how these power the customer experience

arnslev Premier Leisure has rebranded its gyms as Your Space Health and Fitness Clubs, with the new look rolling out at Pontefract, Metrodome and Hoyland leisure centres.

All the gyms now have a fresh fit-out, featuring innovative Technogym equipment, the latest digital experiences and an exciting variety of gym floor classes.

Move to feel good

The Your Space brand has four key values; local, fun, friendly and innovative. These are at the core of both the rebrand and the company's ethos, which is dedicated to creating an inviting and sociable environment where members can enjoy free time.

"Our motto is 'We're a local gym, for local people', with staff always striving to help every member to achieve their personal goals," says Rachel Rinkcavage, brand manager at The small group exercise format of Your Space creates a social, teambased atmosphere.

Tom Galvin, Your Space

Your Space "Our rebrand is a vibrant undate where we've created an inclusive and welcoming experience on the new gym floor, that's both an enjoyable and non-intimidating space."

Creating an atmosphere

To design a sociable atmosphere that is fun, innovative equipment and classes have been introduced, forming new and exciting workout areas. With the help of Technogym solutions, Skillbike and Skillrow gym floor classes



The rebrand is a vibrant update

Metrodome uses the power of digital to create and promote multiple fast classes throughout the week. Trainers proactively encourage members to take part as well as utilising the club signage as promotion.

"We wanted to create a format around two core pieces of equipment that were advanced, innovative and non intimidating. The Skill Line meets this criteria perfectly, as the athletic training capability means our members are being pushed to develop their training skills and technique.

Additionally, the gamification element offers enjoyment and training in an interactive way," comments Tom Galvin, regional manager and head of fitness at Your Space.

The new service plan

To further enhance the member experience, Your Space has decided to go a step further and put digital at the forefront of their member's journey at all three sites. mywellness cloud was launched as the core digital platform to offer a bespoke member journey.

Using the mywellness cloud business solutions Profile, Prescribe, Self and Challenge means Your Space members can create an aspiration map, have a prescribed programme or choose their workout from a library and join a club challenge.

"We've been doing a lot of backof-house work launching our own service plan. This creates a bespoke iourney for each member - gone is the 'one size fits all' approach, within the







new journey, the experience starts with each member completing an aspiration map, then being provided with a dedicated service plan, assigned an instructor and educated on the mywellness app," adds Galvin.

Crucial to the success of the bespoke service plan on mywellness cloud is how trainers can view individual members' plans, including personal workout goals, training programmes and visit frequency.

With the power of this new information, trainers can provide relevant encouragement, advice and support to members. The adoption of mywellness cloud has been consistently increasing, with over 4.000 members across Metrodome and Pontefract experiencing the new member journey.

Journey to success

With a full new brand positioning, innovative equipment and class formats, the project required several weeks of planning.

Pontefract was the first of the sites to relaunched, with extensive plans executed around the rebrand, gvm floor layout, class styles and fitness team training

People can perform a great workout on a piece of equipment they feel comfortable on

"We closed on the Friday and re-opened on the Monday as Your Space. Doing the rebrand this way ensured members were welcomed into a new modern gym, generated the maximum impact and the real wow factor," comments Rinkcavage.

"Pontefract is thriving as a site and social hub now more than ever: six months since the launch the site has seen a 30 per cent increase in members and the NPS score has risen from 59 to 80 after the rebrand."

"The future of Your Space is exciting, with clear reinvestment back into these sites. It keeps members loyal when they see their money is being reinvested and keeps us up to date with the digital trends of the industry by creating an environment where fitness thrives and friends collaborate in a fun and friendly atmosphere."

YOUR SPACE

KEY PILLARS OF SUCCESS

- Clear and vivid branding
- Creation of a fun and friendly atmosphere
- New formats and gym floor zones
- Strong member engagement through class-led experiences
- Defined induction journey for members
- Individual and bespoke digital service plan

For more information on Technogym training experiences and digital solutions call +44 (0)1344 300236 or e-mail UK_info@technogym.com



Fit Tech NEWS

Keepland perfectly complements the app, making for a fitness experience with a strong social aspect Alan Lin



Eight Inc's high-tech gym integrates tech to boost training performance

ight Inc. have created a gym in Beijing for digital fitness startup Keep that integrates technology into the space to improve the workout experience and help ontimise training performance

As with many other gyms, Keepland allows users to browse and sign up for classes using a digital app, but its use of technology goes further.

On arrival, visitors sign in at a screen by scanning a QR code and collect a heart-rate monitor.

The facility is split into distinct Workout and Community zones. with the former atmospherically lit with LEDs to provide a motivational workout training environment and the latter a more relaxed communal area.

The use of modular wall panels. fixtures and furniture make it possible to adapt the environment to suit different types of individuals.



Individuals can follow training instructions on screens around the Workout area, with performance tracked and relaved on to screens. as well as later on to screens in the Community zone where friends can discuss it over a refreshment.

It's also possible for gym users to connect and follow each other's performances on the app, further promoting encouragement and competition within the community.

Workshops and meet-ups held in the Community zone help to further strengthen the community offline.

"Keepland perfectly complements the digital app that has made Keep so successful, making for a complete fitness experience with a strong social aspect," said Alan Lin, Eight Inc.'s managing director for China. "In bringing together data, technology, content, brand and the physical environment, it offers Keep's community a seamless way to take their passion to the next level."

MORE: http://lei.sr/6C1E8



On arrival, visitors scan a QR code and collect a heart-rate monitor



AR app shows weight loss look

A new app using augmented reality (AR) aims to motivate people to get more active by showing, in real-time, what they would look like if they lost weight or gained muscle mass.

EnvisionBody uses optical tracking to capture the user's image, then processes it through an AR

EnvisionBody can be used by dieticians and fitness and wellness professionals application, and displays the user's enhanced image on a screen.

there will be various ways of utilising the software - such as an effective exercise motivational tool that interfaces with exercise equipment.

"We see it being used as a display wall-mounted screen for cosmetic surgeons, diet and weight loss specialists or fitness centers," EnvisionBody said in a statement.

"EnvisionBody creates a fun. engaging experience."

MORE: http://lei.sr/a9w2z

The creators of the tech believe

Mindbody-F45 deal

MORE: http://lei.sr/T6E0Q

Fuzzidarium - an immersive room. designed to remind participants of

a purring cat, with fluffy interiors, virtual reality (VR) and vibrations at 50hz to match a cat's purr, as a way of promoting relaxation.

Guests can also experience a vibrating strobe-light

waterbed, sound baths and

perception bending glasses.

In the Fuzzidarium Immersive spa A digital immersive spa experience, created by Luxury Escapism, has opened in Brooklyn, US. Guests can sample over 10 relaxation stations including the

Wellness tech platform Mindbody has signed a five-year partnership deal with fitness franchise F45.

The deal will see Mindbody's integrated software and payments platform used across all of F45's studio operations globally.

"The F45 team are true innovators, and are helping lead the global fitness movement," said Rick Stollmeyer, Mindbody CEO.

"F45 will offer a consistent experience for studio franchisees." MORE: http://lei.sr/q6l1A

Technogym syncs with Samsung

Technogym's connected cardio equipment is now compatible with Samsung Galaxy Watch Active2.

Active2 users can track their exercise by tapping their watch to UNITY - the Technogym connected cardio products interface - which will pair it with treadmills, ellipticals, indoor bikes and stair steppers.

By syncing with the fitness equipment, Active2 users can access, track and manage a wide range of data - including active and total calories, distance, speed, floors climbed, incline and pace - directly from their watch.

After logging their gym work, users can then consolidate the exercise data with their outdoor training data, creating an accurate picture of the user's activity levels.

The connectivity is the latest addition to Technogym's wellness



ecosystem, which is made of connected training equipment, software and contents, compatible with the most popular wearable devices and fitness apps.

MORE: http://lei.sr/s6d0W

Congdon's Openfit

A new all-in-one digital platform will offer certified, trainer-led live group fitness classes, personalised nutrition programming and wellness tracking.

Called Openfit, the new platform is the brainchild of Jon Congdon, one of the co-founders of athome fitness group Beachbody.

Among the services offered is Openfit Live, a group fitness element with more than 350 weekly live trainersupervised workouts broadcast via digital streaming.

MORE: http://lei.sr/Q9K0n

FitTech NEWS

Our 360° video technology will create a lifelike experience thatwill make working out fun



FitRacers app targets Peloton and Fitbit customers

Largo Technology Group (LTG) is launching a gamified fitness application called FitRacers in Q1 2020.

App subscribers will have access to a 360-degree video feed which they view on their own device

The feed uses augmented reality elements to provide virtual cycling and running trails. 4K resolution 'Bee Vision Technology' immerses subscribers in life-like surroundings, while using their own existing exercise equipment.

The patent-pending software is compatible with smart watches, smart TVs, Android and IoS phones, as well as TV boxes and Windows 10 lantons

The FitRacers app also provides an Al coach and racing forum to connect the community of subscribers around the globe via a live racing engine.

Using smart watches, the app is capable of tracking biometric data and has an integrated fitness application for following physiological metrics.

"Anyone can explore using FitRacers. Our 360° video technology will create a lifelike experience that will make working out fun and exciting."

Largo Technology Group claims the launch of FitnessRacers will disrupt the fitness software industry, with its price point of US\$9.95 a month, and is actively targeting Peloton and Fitbit customers in its marketing.

MORE: http://lei.sr/c4Q9k

Sensync's deep brain massage VR spa experience

Immersive wellness company Sensync has partnered with Four Seasons Resort Oahu at Ko Olina, Hawaii, to launch a VR spa experience.

Sensync's Deep Brain Massage treatments are delivered in The Vessel - a VR pod designed to "displace guests from the burdens of their mind and unlock new approaches for relaxation and restoration".



The Deep Brain Massage relies on the push-pull relationship between two competing types of attention

Alex Theory

Sensync founders Alex Theory and Adam Gazzaley said: "The Deep Brain Massage relies on the push-pull relationship between two competing types of attention (bottom-up and top-down) which define all human interactions with the world around us."

The journeys are designed to 'reset' customer's brains to achieve a state of tranquillity. The idea is that guests' focus is pulled away from goal-directed thoughts, allowing a restoration from cognitive fatigue.

In the pod guests see, hear, smell,

feel and experience sensations of nature. These are presented in unison to leverage the power of sensory synchronisation.

This creates immersive nature experiences that are personalised in real-time using recordings of the guest's physiological responses. The pod monitors real-time data such as respiration and heart rates, and electrodermal activity and then adjusts the treatment accordingly.

This personalised data is then shared with guests on a tablet after their treatment in the form of a map of their journey, to show how they react to different stimuli.

The treatment is claimed to be one of the first experiences to deliver stereoscopic visuals, spatial audio, scent, vibroacoustics, breeze effects and temperature control in unison.

The Vessel offers nature-themed iourneys ranging from 20-80 minutes.

MORE: http://lei.sr/c0n0t



Corporate Wellness 2.0 report: wearable fitness among most popular rewards

ising workplace stress among employees has led companies to increase their investment in incentives as rewards - with wearable fitness gadgets among the most popular corporate perks.

The finding comes from a new report by CR Worldwide. Called Corporate Wellness 2.0 - the report is based on data of 120 enterprises and more than 287,000 employees

It shows that overall, corporate spending on rewards and incentives is rising year-on-year, with the Asia Pacific region doubling its investment in rewards programmes.

UK enterprises doubled their average spend on employee rewards over the past three years, while US companies spent an average of US\$292,000 on employee rewards in 2019.

Gadgets such as fitness trackers, wearable tech products and tablets are among the most popular rewards chosen by employees.

"Individuals are choosing corporate rewards that demonstrate an increased awareness of mental health and wellbeing, such as extra leisure time or health-related gadgets," the report says.



Large enterprises across the world are transforming their workplace benefits

David Gould

"Wearable fitness aids, such as

Fitbits, were in the ten most popular corporate rewards across EMEA (including the UK) and the US in 2019." According to David Gould, CEO of CR Worldwide, the increase in companies investing in rewards is due to an evolving employment landscape. "Large enterprises across the

world are transforming their

workplace benefits and brands in response to major changes in workforce demographics that are affecting recruitment, retention and productivity," he said.

"Rising stress, ill-health and skills shortages among a new generation of workers are stunting productivity, growth, wages and living standards.

"Younger workers are also more likely than previous generations to prioritise prospective employers' values and their individual ability to make an impact over salary and status. This is causing big brands to lose out to start-ups in the talent race.

"The evolving profile of the modern employee is driving a parallel transformation in business travel, culture, benefits and workspaces.

"Evidence indicates that young workers are less financially oriented and more likely to distrust big businesses than previous generations. In response, companies are creating millennial-friendly 'employer brands'.

"Also, individuals are choosing more corporate rewards that benefit their personal wellbeing." MORE: http://lei.sr/p0A2W

Real Madrid launches innovation brand and plans to enter e-health sector

Real Madrid has launched a new innovation brand which is designed to position the football club as a "social and economic leader".

Called Real Madrid Next, the initiative will see the club collaborating with start-ups across six industry sectors - e-health, fan engagement, audio-visual content generation. cybersecurity, business performance and technological and social.

The club will offer start-ups access to its resources and expertise, while working together with new companies to develop their products and services, focusing on areas which will benefit the club and the wider economy.



We will look for excellence and the best technological advances possible, which will help create our own, exclusive tools

"We will look for the best technological advances, which will help create our own, exclusive tools " said a club spokesperson.

"We want better results in every area of the business, in particular, digital transformation, the sporting area and globalisation."

MORE: http://lei.sr/1D3H8

US college hosts 'IoT Bootcamp' for smart tech

The Deep Dive Coding programme at Central New Mexico Community College (CNM) in the US is launching a 10-week Internet of Things Bootcamp.

Beginning on 24 February 2020, the college is inviting interested students to enrol in the programme, which will offer tech and entrepreneur-minded youngsters the tools to benefit from the proliferation of smart devices and wearables which constitute the Internet of Things (IoT)

The initiative will teach students the fundamentals of creating and coding smart connected devices built around low power computer chips. Starting with learning the components needed to build a smart lighting controller, students will be exposed to the fundamentals of circuit design, coding, and integration that will accelerate them towards careers in industries that build and/or use IoT devices - such as health and wellness.

It is estimated that there will be 1 trillion connected devices by 2035

- equating to more than 100 smart devices for every person on earth.

"Today, we see the proliferation of the IoT (smart, connected devices) into many facets of society," a spokesperson for the CNM said.

"We are entering the age of advanced manufacturing, what is being referred to as Industry 4.0,

where predictive analytics, generative design, advanced materials, ubiquitous sensors and automation/ robotics is revolutionising industries.

"Our routines outside the home will he revolutionised. From wearables to autonomous automobiles, technology is impacting every aspect of our lives."

MORE: http://lei.sr/y4u3u



Students will be taught the fundamentals of creating smart connected devices



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Jose Teixeira: analysing data is key to understanding club members

ollecting and analysing data is paramount for any health club wanting to improve its service quality and retention. according to José Teixeira, head of customer experience at Portuguese fitness group SC Fitness.

Speaking to HCM, Teixeira explained how SC Fitness - which operates 35 health clubs across three separate brands - has used data to take the guess-work out of customer relationship management (CRM).

"We have a business intelligence department with two business analysts and a psychologist." Teixeira said.

"We no longer have to make assumptions, we can work out the reason and support it with numbers.

"We have a lot of data about members: not only age, gender, height, weight and health, but length of stay, and usage. We track entries and exits of group exercise classes and use sensor cameras to get further usage data. We profile clients, and monitor who is coming and who is leaving."

Teixeira adds that analysing data has allowed the company to dispel



People who use the club more, stay members for longer Jose Teixeira

some previously held assumptions about customer behaviours.

"For example, we have found that overcrowding is much more important than both cleaning and maintenance in terms of its role in causing a member to leave," he added.

"If there isn't space to work out, because there aren't

enough treadmills or room in the class, members will leave.

"An instructor missing a class hurts the club a lot more than some hair in the showers. Cleaning and maintenance in the gym is certainly important, but it is not as important as many would assume.

"We also found that older people stay as members for longer: they have more stable lives, are more stable financially and move less. And people with a contract also stay longer.

"People often assume that those who pay more stay longer, but we don't see this. What we see is that if you have PT sessions then you stay longer because you use more, not because you pay more."

He revealed that, for SC Fitness, the most important factor for improving member retention was increasing individual usage.

"People who use the club more, stay as a member for longer," Teixeira said.

"For each incremental visit per month, people will stay 1.26 months longer as members.

MORE: http://lei.sr/A2I6b



US fitness operator enters crowded on-demand fitness market

A local fitness operator with 11 clubs in Chicago, US, is looking to enter the crowded on-demand, at-home fitness market by launching its own offer.

Fitness Formula Clubs (FFC) was founded in 1984 and has eight clubs within the Chicago city limits and three in the near Chicagoland suburbs.

It has now set up the FFC On Demand mobile and website app in partnership with its technology partner Virtual Health Partners

Priced at US\$14.95 a month, the app features group fitness content with a wide range of classes - from and voga - recorded at FFC studios.

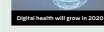
It also offers nutritional advice, content on behavior modification. mindfulness and overall wellness: and monitoring tools on food intake, diet adherence and weight loss.

It also integrates with Myzone and other popular fitness trackers.

Gale Landers, FFC founder and CEO says: "Our commitment is to meet the health, fitness and wellness needs of Chicago and the surrounding communities."

MORE: http://lei.sr/w2f0X

HIIT and strength classes to dance



CTA prediction

The increasing popularity of streaming services and wireless earbuds - plus the introduction of 5G connectivity and AI-enabled devices - are set to drive revenues in the US consumer tech industry to a record \$422bn during 2020.

According to the Consumer Technology Association (CTA), retail revenues in the tech sector are expected to grow by nearly 4 per cent over the next 12 months.

The CTA expects the digital health category to reach a record 64 million devices sold.

MORE: http://lei.sr/i7d0a

Brain optimisation

New York's Blum Center for Health has started offering a personalised, non-invasive, neuroenhancement programme.

Provided by Field, the FDAapproved neuro-technology company, the programme has the potential to optimise clients' brain function and performance, which could stimulate symptom resolution for stress and anxiety, depression, PTSD, ADHD, and postconcussive trauma

MORE: http://lei.sr/H3m8R

Legend gets Social

Legend Club Management Systems has announced it's working with Netherlands-based Social Leisure for everything from bookings and CRM to reporting, access control and payments.

The operator runs indoor and outdoor pools, sports halls and gyms and is using Legend's One System, One Solution'.

Legend has integrations with Technogym's mywellness, Fitbit, iPrescribe, Boditrax and Google Fit, as well as things such as TRP, Mandrill and Mailchimp.

MORE: www.legendware.co.uk

Life Fitness adds on-demand workout classes to CV equipment

Equipment supplier Life Fitness has created on-demand digital programming for use on its commercial CV equipment.

Called Life Fitness On Demand, the new service will see digital classes being made available exclusively on the touchscreens of Life Fitness



premium cardio products - including treadmills, ellipticals, climbers, cross-trainers, and exercise bikes.

Classes are designed to reach exercisers of all fitness levels, range between 10 and 40 minutes and offer a wide variety of difficulty levels, coaching styles, and music genres.

Life Fitness has partnered with New York-based studio NEOU to produce and film the classes.

According to Dan Wille, Life Fitness' global VP of marketing and product development, the move will allow fitness facilities to benefit from the virtual fitness trend.

"With the introduction of Life Fitness On Demand, exercisers can have an engaging cardio experience on a variety of equipment," he said.

MORE: http://lei.sr/F7t3s

FitTech NEWS

Recent studies confirm that using trackers with online community-based support promotes motivation in users



Fitness trackers 'make gym sessions more enjoyable'

Those who use fitness trackers are twice as likely to enjoy their gym workout (61 per cent), when compared to those who don't (30 per cent).

The figure comes from a study by UK leisure centre operator Better, which surveyed 2,000 gymgoers to find out how wearing gadgets might affect exercise habits and motivation.

According to the study, more than half (55 per cent) of gym members who wear a tracker during exercise experienced increased motivation, while 53 per cent noted that they are exercising more frequently and consistently since having a tracker.

Wearing tech can also help in real terms - 48 per cent of those using trackers during gym sessions credited the tech with helping them reach their personal fitness goals.

The most frequent users of the tech were men between 45 and 54 years. When asked about the main reason for monitoring fitness activity. respondents identified the tracking of progress as the most important reason (71 per cent), while 62 per cent do so for increased motivation to reach fitness goals. Just under half (46 per cent) track their activity to understand their body better.

According to Dr Haider Raad, wearable tech expert and professor at Xavier University in Ohio, US, wearable trackers are becoming an integral part of the gym experience.

"A number of trackers allow users to compete with friends and share their accomplishments via social media, which could be a great way to get support and stay motivated," Raad said.

"In fact, recent studies confirm that using trackers with online communitybased support promotes motivation and is highly effective at increasing engagement and adherence."

MORE: http://lei.sr/v8T9r

InBody sets up nationwide network of testing

Biomedical tech specialist InBody USA is launching a network of body composition analysis testing sites across the US.

InBody has developed the network with partners across different industries - including fitness, medicine and nutrition - and plans to have a presence in every US state.

Each site will offer the InBody Test - an analysis of body composition aimed at giving members of the public a unique insight into their health.

The 45-second tests measure and track metrics such as muscle mass, fat mass and water distribution. The company is also introducing a new flagship device - the InBody 970.

Revealed at the recent Consumer Electronics Show (CES), the device

features in-depth abdominal obesity analysis and medical-grade body water analysis. It will be released in 2020.

"We are committed to helping people to constantly improve their health through education," said Harry Yun, CEO, InBody USA



InBody tests take just 45 seconds

"We collaborated with our network of industry experts that use InBody devices to launch a locator map that will help people gain access to body composition testing and expert consultation that will help them reach their health goals."

Fitness partners that InBody is working with include franchised boutique brand Orangefitness.

All Orangetheory franchisees are being offered the opportunity to include InBody services at their studios.

"Orangetheory Fitness boasts an impressive list of workout technology for members, and adding the InBody Test will complement the heart rate and performance data to give members a complete picture," said Yun.

MORE: http://lei.sr/7b5Q1

Hyatt announces collaboration with mindfulness app provider Headspace



Hyatt Hotels has announced a collaboration with mindfulness app Headspace, set to roll out in coming months at Hyatt-branded hotels.

The partnership will provide mindfulness exercises, guided meditations and sleep content to Hyatt employees, corporate customers and guests.

Founded by former monk Andy Puddicombe and Rich Pierson. Headspace is a healthcare company specialising in meditation, offering mindfulness advice and guidance via an app. The app has nearly 60 million users in 190 countries

Puddicombe said: "Our mission is to improve the health and happiness of the world, and we're thrilled to

collaborate with Hyatt to make mindfulness more accessible to people wherever their travels may take them."

The collaboration has been designed to ensure better care for Hyatt's employees' and guests' wellbeing, with a variety of mindfulness experiences.

Guests will receive access to in-room content, including short meditations and soothing sounds to encourage restful sleep.

Employees will be offered a complimentary Headspace subscription, while corporate customers will have the opportunity to incorporate Headspace content and experiences into meetings packages.

MORE: http://lei.sr/N0y8p



Our mission is to improve the health and happiness of the world

Andy Puddicombe

New Apple Watch programme rewards gym goers

Tech giant Apple is venturing further into wellness by launching a new Apple Watch Connected programme. to reward gym members for wearing the watch during exercise sessions.



Launched in January 2020, the service is built around an incentive programme, allowing users to receive rewards by being active.

Apple has initially partnered with four major fitness chains in the US - Orangetheory, Basecamp Fitness, YMCA and Crunch Fitness - with plans to connect with many more.

Gym operators hoping to be part of the programme must offer iPhone and Watch apps which allow the tracking of stats, while also providing class timetables directly through the app.

They must also accept Apple Pay, so members can use their Apple Watches to make payments at the club.

Each individual operator is free to decide the type of reward they want to offer to members through the "Earn with Watch" programme.

Basecamp is offering users the opportunity to earn back the cost of an Apple Watch Series 5 GPS, while Orangetheory is offering redeemable Apple and Nike gift cards

Members at Crunch can earn weekly credits (believed to be between US\$3 and US\$4) if they meet their exercise goals - and the credits will then be applied and deducted from the cost of their monthly membership.

YMCA has pledged to create a system where YMCA will donate to "community initiatives."

Crunch Signature CEO Keith Worts said: "This will help member retention".

MORE: http://lei.sr/D5T0j



Al tech predicts seniors' falls and ailments

new product aimed at the ageing population is combining wearable fitness tech with artificial intelligence to create a device designed to help predict potentially harmful ailments. US-based AI specialist CarePredict

has launched the Tempo Series 3 wearable tracker, designed to detect small changes in the daily activity patterns of seniors. Theses changes in patterns can often precede falls, malnutrition, depression, and Urinary Tract Infections (UTIs).

The tech is able to autonomously observe and chart the activities of

daily living (ADLs) - such as eating, cooking, walking, sleeping, bathing, and bathroom use patterns. The system uses sensors, indoor

location data, machine learning and At to learn the senior's "normal" activity pattern and alerts family and friends when there is a deviation from this normal pattern.

These insights allow families of seniors to know when they are skipping meals, aren't sleeping well, are less active or if anything is different from their usual daily patterns.

Using a linked CarePredict @Home app, family can receive alerts and see how the user is doing on a daily basis.

"The data from conventional fitness trackers and smartwatches are not sufficient in assessing the continued wellness of a senior," said CarePredict CEO and founder Satish Movva.

"Tempo has been developed exclusively for the care of seniors with their unique needs in mind.

"For instance, falls can occur during the night when conventional wearables are being recharged.



CFO and founder Satish Movva

"So, we designed the Tempo with a swappable battery to ensure it never needs to be taken off for charging.

"Some wearables come with a button to alert for help, but Tempo goes beyond that to provide twoway communication that allows seniors to speak directly with family members for immediate reassurance.

The Tempo 3 was launched at this month's Consumer Electronics Show (CES) - where it received an "Innovation Awards Honoree" gong.

MORE: http://lei.sr/e1G1b



Tempo can predict falls and UTIs

Some wearables have an alert button, but Tempo provides two-way communication

Partnering with Fitbit helps incentivise our members living with diabetes manage their condition



Fitbit signs tech deal to help manage diabetes

WellCare of Georgia has signed a partnership deal with Fitbit, which will see the fitness trackers being used to help manage the conditions of those living with diabetes.

The deal will see Fitbit devices being delivered to any WellCare Medicaid members who are taking positive steps to manage their diahetes - such as completing their annual diabetic eye exams.

It is estimated that more than 10 per cent of adults in the state of Georgia currently live with Type 2 diabetes, a condition that, if not properly managed, can severley impact many areas of the body.

From 1 January 2020, WellCare is offering a Fitbit Inspire to all Georgia Medicaid members who are age 18 years and older with a diabetes diagnosis, and are enrolled in the Fitbit Diabetes Programme.

Fitbit Inspire offers activity tracking. sleep tracking and reminders for the user to regularly move.

WellCare's Fitbit Diabetes Programme is the first time Fitbit will he included in a Medicaid program

The company hopes that the devices will encourage those with diabetes to increase their physical activity levels. Studies show exercise is a key component to managing diabetes.

According to a study in the World Journal of Diabetes, walking for at least 30 minutes per day was shown to reduce the risk of Type 2 diabetes by approximately 50 per cent and was associated with a reduction in mortality.

"We're excited to partner with Fitbit as we work to educate, motivate and support our members around the benefits of physical activity," said Dr. Clarence Davis, WellCare's senior medical director for Georgia.

"Fitbit's fitness tracker complements WellCare's existing resources and will provide yet another resource to help our members manage their condition." MORE: http://lei.sr/v4V7l

Fitness franchise StretchLab invests in movement

US fitness franchise StretchLab has revealed new plans to add machines that identify movement inefficiencies into its programming.

The assisted stretching franchise - owned by Xponential Fitness will begin rolling out TRX MAPS Technology across its 50-plus studios The TRX technology identifies movement inefficiencies across four categories



The TRX technology identifies movement inefficiencies across four categories - mobility, activation, posture and symmetry (MAPS).

It uses 3D technology to perform a total body movement assessment scan in under 30 seconds, as users perform three body-weight squats.

Results are delivered on-screen and via email, which will allow Stretchl ab's trainers to create a customised movement plan and offer a measurable way to see progress in flexibility.

"With technology-driven and trackable workouts continually on the rise in the fitness industry. StretchLab is excited to bring this trend to the recovery space," said Lou DeFrancisco, president of StretchLab.

"While the benefits of stretching are undeniable, the integration of this technology will prove just how advanced our programming is."

MORE: http://lei.sr/x8b5e



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mindbody







The team behind Motosumo consists of engineers and astrophysicists, who are also elite-level athletes in their spare time

What is Motosumo?

Kresten: It's a fitness tracking system using the motion sensors in a smartphone. We believe we're the only tech company in the world that can track how you ride a bike without putting a sensor on it and without a heart rate monitor.

Nick: A major advantage of Motosumo is that it's agnostic. Clubs don't have to buy a new range of software, hardware or any equipment. It works with all equipment and just involves downloading an app, so it is really easy to install.

How did it come about?

Kresten: It originated from a very nerdy group of people, out for a pizza one night in 2012, who





Clubs no longer have to change all their hardware and software in order to introduce new technology

got talking about how we would like to design a powerful system for tracking and analysing fitness data, with just one small sensor.

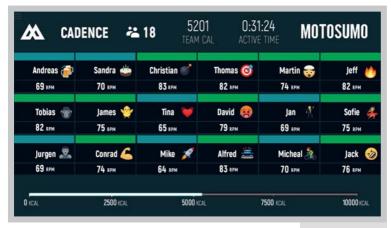
We successfully went on to do this, but then became ambitious about making it more universal, and capable of taking on the bigger players in fitness. So, with the former Endomondo investors on board, we set about designing a way to measure the same metrics that normally require a \$1,000 USD gadget but instead using only a smartphone.

Nick: Kresten is being a bit self deprecating when he says they are just a group of nerds! It's true that they have degrees in engineering, astrophysics and modelling human physiology, but they are also elite athletes who have spent time sweating in the saddle and understand the technical aspects of training. They have a good understanding of what data is interesting and valuable, which is evident in the product.

Why did you decide to focus on group fitness?

Kresten: Everyone is on their smartphones, so we saw this as a massive opportunity to develop a gamification aspect that would drive up engagement in group fitness classes, using the mobile network to create a community.

The gaming can work on many levels - trying to beat previous records or goals, or being in teams to reach your goal together. Or it can be for charity:



we just had an event where people all over the world were burning calories to donate trees.

The system lets group fitness users compete against one another

Who is the target market?

Kresten: We want to appeal to the average punter, not the elite guys, but the 80 or 90 per cent of club users who aren't super competitive.

We have a full range of clubs using Motosumo, but our main target market is the non-elite, although several boutiques have taken us on. Currently, 25 per cent are in Europe, 25 per cent in the US, 25 per cent in Latin America and 25 per cent in the rest of the world.

What have been the main challenges with getting Motosumo up and running?

Kresten: An initial challenge was to gain a foothold, as the industry can be slow to adopt new technology and initially no one wanted to buy into a subscription - which was interesting for an industry built on subscriptions! But that has changed now that wearables and services like Spotify are on everyone's radar.

Nick: One reason the industry may have taken a while to adopt technology was that the first generation consisted of closed proprietary systems, where nothing was integrated, making it complicated to choose a system. Now we're seeing a new generation of open platforms, so clubs no longer have to change all hardware and software in order to introduce new technology.







Gamification features help drive member engagement



What's involved if a club wants to sign up?

Kresten: It's just a case of downloading an app. We run a 45 minute webinar for instructors and then the clubs promote it to members via their usual channels. It's up to gyms to decide how pro-active they are, most just activate with the webinar and a Facebook announcement.

How long does it take to engage members?

Kresten: People tend to get on board very quickly - we recently launched gyms in Columbia, which had more than 200 users in the first week and we keep them engaged with bi-weekly updates.

Nick: The short training period means it's unlikely anyone will get lost in the complexities of it, which I think is why it works so well in the initial phase of getting members on board.

Do you have any figures to show how Motosumo can benefit operators?

Across all of our users, we have figures to show that from late 2017 to late 2019, the engage per gym, using Motosumo, increased by 150 per cent.

It's just a case of downloading an app. It's up to gyms to decide how proactively they promote it

Another benefit we can give to operators is the data we have about their group fitness classes. We can see exactly what happens in every class. If it's a HIIT class, did everyone go to the red zone at the same time? Do ratings go up or down when you launch a new concept? Useful information when doing talent and concept management.

Pandemic prompts home market launch

Motosumo has launched HomeTeam, a new service

that enables gym operators to deliver HIIT group workouts and indoor cycling classes to their members' living rooms.

Designed as a low-cost feature for operators

HomeTeam can be set up in five minutes and is capable of delivering a connected at-home fitness experience.

Users can tune in to a live video stream and join in with a smartphone and a heart rate monitor - or, if they have one, a stationary bike. Participants are then connected through the

app, which offers a range of fitness data as well as games, races, countdowns, music, emoiis and more.

According to Kresten Juel Jensen, CEO of Motosumo, HomeTeam was created in response to the challenges fitness clubs and gyms are facing during the coronavirus pandemic, as they are forced

HomeTeam is offered on a monthly subscription to gym operators at US\$124 (€115, £106) per gym or \$208 (€192, £177) for indoor cycling, with no binding contract

to keep their doors closed.

Nick - having come on board in December, what will your role be?

Even though I've only worked at two companies - Holmes Place and Fitness Hut - something I like to do is spend time looking at other companies and clubs, and so I have an informed perspective on the industry and I can see how Motosumo could integrate into different clubs. I can bring my 25 years' of operating experience to the company and help nuance the app for the non-elite user.

What are your future ambitions?

Our ambition is to become the gold standard for group fitness experiences. Fifty per cent of members go there and the potential for retaining them for longer is huge. We want to deliver it in a form which is for the masses. Since we already have a platform for home training, I also see this taking off within the next year.

Members from 1,000 gyms used Motosumo in 2019 and our revenues tripled. We'll do that in 2020 too, at least. We aim to make group fitness in your gym something users will come back to for 10 straight years, not for a few months. •

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WHAT'S THE **FUTURE OF HOME FITNESS?**

The days of a home workout being a video in the living room are long gone. The coronavirus pandemic is driving a massive pivot to digital, which is transforming the sector. Kath Hudson reports

he coronavirus pandemic has seen the home workout sector experiencing exponential growth in every direction, with some on-demand providers reporting 800 per cent increases in take-up.

This comes off the back of a record year for at-home digital in 2019, which saw an explosion of new and repackaged entrants to the space, including Echelon, MYXfitness, iFit via NordicTrack, Tonal, Mirror and Openfit via Beachbody co-founder John Congdon.

According to 2019 research from L.E.K. Insights, digital fitness content market growth in the US alone was expected to

translate to 14 million new subscribers and a US\$3.3 billion market opportunity this year - and that was before the pandemic. Research also shows that 85 per cent of club members also exercise outside clubs.

The pandemic has prompted the majority of operators to launch a digital offering some in partnership with existing fit tech companies, some creating customised solutions, and some simply jumping on Zoom. Whatever follows, 2020 will be remembered as the point where fitness went digital, but will this ultimately create competition for clubs or will it grow the market? We ask the experts





Rasmus Ingerslev

Director of REPEAT, Barry's Nordic, Lenus, Wexer and Playbook

or those who want to get fit, but don't join a gym, the same three reasons are consistently given: intimidation of the gvm environment, price sensitivity and lack of time. Working out at home addresses all of these points: no one is watching, it is typically cheaper and there is no commuting time. Plus home workout apps are very good at building habits and holding people accountable - often much better than operators.

In gyms we cater best to those with a mid- to high-level of gym confidence. Those with less confidence are best catered for at home, so if gyms offered a digital extension to their physical offering they could expand the reach of their appeal.

Gym memberships tend to be made up of 20 per cent of people who are going to leave regardless of what you do, 20 per cent that you couldn't force to leave and 60 per cent who could swing either way. For those in the middle 60 per cent, a digital offering could continue to engage them and make the gym value proposition more sticky and valuable.

I think it would be crazy for the industry not to include digital in their member journeys and pure digital memberships in their offering. There is significantly more growth in the digital space and the industry is well placed to make use of this opportunity because of the huge database of members and lapsed members.

A major brand tracking why members were leaving found a double digit response for those going for digital services. We could support members much better by incorporating digital fitness services to help them reach their goals. There has been a significant change in consumer behaviour and we need to change accordingly. This could be a way to reduce churn. When a member leaves it's not because they've achieved their goals, it's because they've lost motivation and stopped working out.

"

If you fear that home fitness offerings may disrupt your business, you need to get into it and disrupt yourself

Nigel Bland

Deloitte: corporate finance advisory leisure team lead

irtually every form of physical activity has grown in the past 15 years and, even though the rate of growth is slowing, the industry is still growing. There doesn't appear to be any slowdown in people becoming more health conscious, so the untapped market still offers great potential. The more product offered, the more revenue it can capture.

Therefore, although the home fitness market could present a challenge to the bricks and mortar side of the sector, I think it is more likely to be

additive than disruptive. There is evidence that fitness is important to an increasing number of people and they are prepared to fragment their spend: for example with a budget gym membership, as well as paying for boutique classes. Real enthusiasts might be prepared to buy an expensive piece of kit to use at home and still pay for classes or to use a gym.

However, if you fear that it may disrupt your business, then you need to get into it and disrupt yourself. Digital fitness is a less capitally intensive business than physical clubs and if you get the product right then you can have unlimited people doing a class. Digital interaction with your membership represents another way of keeping engagement levels up, so that attrition levels stay manageable.

There will be some people who would never join a gym, but would do online training and there will be people who switch between digital options and club membership, in both directions, but more products will engage more people and make the pie bigger.





seen a boom in the ome fitness market. The Peloton buzz, in particular, has driven some traction for the consumer market, and heightened demand for other home products, particularly with the zero per cent finance and flexibility of purchasing which is available for these products.

Currently growth is focused on the premium end of the market - time poor urbanites - who would otherwise have trouble fitting a workout into their busy lives and want to get the maximum benefit in the shortest possible time. But while time and

convenience is high on the list for home exercisers, there are a number of people who just prefer to work out at home: they might be intimidated by the gym environment, or just prefer to be alone and choose their own music. One down side of home exercise is that the infrastructure is more limited than in a commercial environment. so as products and solutions change it can be harder to stay on trend. Without expert help to hand, people can also get into a comfort zone, just doing the same and not seeing any progression. On the up side, this could then encourage them to join a gym.

Digitisation offers the opportunity to create home exercise communities. It also has the opportunity to engage new audiences, particularly tech-savvy people who might be drawn by the digital element.

Gyms are going to have to adapt to this trend and understand that the member journey is not just what happens inside their club. If members are offered the chance to do an instructor-led workout at home. it adds value to the membership and a full circle experience.

Since the COVID-19 outbreak started, we've seen an 806 per cent increase in sign-ups to Les Mills on Demand, as we've worked with our club partners

Jean-Michel Fournier Les Mills Media: CEO

he two largest generations of fitness users – millennials and gen Z – make up 80 per cent of the fitness market and are carnivorous consumers of 24/7 digital streaming, including exercise content.

Despite this demand for streaming and downloadable fitness content, it had only been adopted by 5 per cent of operators prior to the pandemic.

According to the Club Intel 2019 International Fitness Industry Trend Report, European club operators were clear leaders, with an adoption level of 14 per cent. Levels in other regions of the world ranged from 4 to 7 per cent.

Mobile apps – which are used by more than 80 per cent of people to

connect with businesses – had only been adopted by 20 per cent of the fitness industry. So it's clear there's a lot of untapped upside in the digital home fitness space, particularly with much of the world currently in lockdown.

Les Mills on Demand (LMOD), which allows users to stream Les Mills programmes from any digital device, has seen significant growth in recent years, but since the COVID-19 outbreak, we've seen an 806 per cent increase in sign-ups as we've worked with club partners to help them support members through the use of LMOD.

Clubs offering a co-branded LMOD subscription to members are able to boost member loyalty and keep them



in the exercise habit at times like this, when they can't make it to the gym.

As fitness moves from bricks and mortar to digital, operators who pursue tech assertively will be the ones who thrive in the next chapter of the industry.





We were creating an entirely new category

JOHN FOLEY

Founder and CEO, Peloton

Ever since its state-of-the-art bikes entered living rooms in 2014, Peloton has been transforming home fitness, giving members access to live boutique cycling classes. Fit Tech speaks to founder and CEO John Foley about the brand's journey...





What was your background before founding Peloton?

I began my career working in manufacturing at Mars Inc. I went on to work for various consumer technology brands, including Pronto.com, where I served as CEO and was also a co-founder of both Evite.com and Citysearch.com.

Prior to Peloton, I was president of Barnes & Noble. This background in manufacturing and technology, combined with my own passion for boutique fitness, led me to start Peloton.

How did you come up with the concept for Peloton?

My wife, Jill, and I have always been pretty serious about staying fit and we enjoyed going to boutique studio fitness classes. But, with an increasingly busy work schedule and two young children, we found that we were struggling to work out as much as we wanted. I felt that there had to be a better way, a way where you could digitise and scale the experience, and so the idea of Peloton was born.

Why did you decide to create your own bike, rather than simply creating a streaming platform?

Peloton sits at the nexus of fitness, technology and media, but that concept evolved over time. In the early years, we knew we wanted to be a software company, so we looked at the hardware options already out there and considered adding our software to someone else's hike. However there hadn't been much innovation or capital in the category so we decided to build our own bike.

How did you turn your concept into reality?

At first, my co-founders and I were incredibly focused on technology and getting the product right. We launched a Kickstarter campaign for the bike and did a small amount of marketing on Facebook, In late 2013, we found a retail space in the Short Hills shopping mall in New Jersey. This would become our first showroom; we now have over 80 across the US, UK, Canada and Germany.

The next area of focus was logistics - we knew we wanted to deliver the bikes ourselves and be able to tell our new members about the product. So, we hired a van and tested deliveries in a few zip codes in New Jersey. Today, we still deliver 70 per cent of our bikes and treads.

When designing the bike, what features did it need to have?

We put a ton of thought and engineering into the design and technology of the bike, which we believe is the best out there. As the bike is designed for home use, there were certain features it absolutely had to have.

For example, the near silent belt drive, which enables our members to ride without noise or disruption, and the magnetic resistance - there



is no contact between the moving wheel and the brake, leading to a much smoother feel and more consistent braking force on the bike.

How did investors take to the concept?

For investors in the early days, Peloton felt capital intensive with a high operational risk, so they didn't initially see that it was a good idea. We were also doing something completely new, so for some potential investors the vision felt too far-fetched, that we were trying to be too much. However, my co-founders and I could see what needed to be done not only to fill a gap in the marketplace, but also to create an entirely new category and so we kept going.

Who is Peloton's main target market?

We have a very diverse member community across everything from geography to socioeconomic level. They are often time-poor so really appreciate the ability to fit an amazing workout into their busy schedules.

Overall, we created a product that allows people to connect with a community that shares their passion, without having to leave the comfort and convenience of their own home.

We've introduced German instructors and a localised bike UI for our German members

Tell us more about your journey growing the Peloton brand?

In the early days, we had the challenge of convincing investors of our vision, but Peloton has grown rapidly and is now the category leader for connected fitness. We have a highly engaged audience of 1.6 million members worldwide.

In 2018, we began our expansion, starting with the UK and Canada. This year we launched in Germany, our first non-English-speaking market. We've introduced German instructors and a fully localised bike UI for our German members.

In terms of people, we've grown from a team of four to over 2,000 employees globally.

Tell us about Peloton digital

The Peloton app launched in 2018. It's complimentary for all bike and tread owners and provides access to all of our content







Peloton started off with a bike, but we never set out to be just a bike company...



anytime, anywhere. You can also purchase our digital membership as a standalone product.

Over time, we've introduced more and more features on our app. For example, this year we added GPS metrics for our outdoor content and Apple Watch integration for members working out with the Peloton app on their iPhone. This means more and better metrics and improved control access. In addition, we've just launched on Amazon Fire TV so you can take one of our classes - anything from strength to yoga - in front of the largest screen in your home.

Digital is an exciting opportunity, as we can provide even more people with access to our content. For example, people who already own a non-Peloton stationary bike or treadmill can now transform their workout experience.

Do you supply Peloton bikes and treadmills to many businesses?

Our focus will always be B2C. However, since we delivered our first bikes in 2014, we've heard from our community that they want to continue working out with Peloton while they travel. Today, there are hundreds of hotels that have purchased Peloton bikes for their guests to enjoy.

For our members, the availability of bikes at hotels means they can continue their Peloton experience and stay connected to their fitness routines even while away from home. It also

We're combining the best software, hardware, content and experience in one place

enables us to bring our brand to an entirely new audience, who we're sure will fall in love with the Peloton experience as well.

Last year, we launched an interactive Hotel Finder map so that Peloton members can not only search for properties that have Peloton bikes, but they can also search and book hotels directly through the site.

We also work with a select number of corporate partners to provide the Peloton experience to their employees.

Do you see Peloton as competing solely with other at-home fitness products, or is it also competing with studios like SoulCycle?

No one is doing what we're doing, anywhere in the world - combining the best software, hardware, content and experience in one place. We created the category and we're confident about the quality and uniqueness of the Peloton experience, so we spend a lot more time thinking about how we can continue to innovate and deliver the best possible experience to our members globally than focusing on competition.



Speaking of focusing on your members, how do you use their data?

We provide data for all of our members to track their own workouts and progress over time. One of my favourite pieces of work we do is our annual year in review. Each member receives an overview of their workouts from that given year, the instructor they took the most classes with and some fun, comparative stats.

We also use data to inform content choices, such as the length and type of classes we're producing, which ultimately improves the experience for our members.

How do you manage music licencing? Would you say it's essential to your business to be able to use popular music, despite the high costs and legal issues?

Music is a hugely important part of our business and, in many ways, we are a music discovery platform. We have agreements with major publishers, record labels and performing rights organisations, as well as many independent publishers and labels. These agreements



Music is a hugely important part of our business and, in many ways, we're a music discovery platform



provide licenses to a broad catalogue of music that our instructors can choose from to help them programme great class content.

In 2018, we began working with a few artists, who we know our members and instructors love to ride to, for the launch of a series celebrating their music in artist-dedicated classes. This has been a great success, and we've worked with some incredible artists, such as Lizzo, JLo, Paul McCartney, Madonna and Pink.

Last year, we also launched a Track Love feature, which allows members using our hardware to save songs from our classes to a playlist in their Apple Music or Spotify accounts for later listening and sharing.

Do you have plans to release any new products or features?

Our research and development team is always working on ideas and this past year we've introduced lots of new features, including an improved home screen on the bike, which brings personalised class recommendations to front and centre. Many of these have been launched based on member feedback. Ultimately, our true north star is ensuring that members have the best experience possible - whatever innovations we may have on the horizon.

This year, we'll launch stateof-the-art studios in London's Covent Garden and in NYC

What do you predict home fitness will look like in 5 or 10 years?

Technology will continue to play a huge role. For Peloton, technology underlies everything we do and it's a big differentiator for us. Also, I think there will be more focus on the breadth of content. At Peloton, we produce broadcast quality content from state-of-the-art studios and we're continually introducing new formats.

What aspect of Peloton and its journey are you most proud of?

Peloton started off with a bike, but we never set out to be just a bike company and I'm most proud of how the company has grown and evolved. Since launch, we've introduced new hardware (the Peloton Tread), yoga and many other content formats. We've expanded internationally and grown our community to 1.6 million members worldwide. This year, we'll launch state-of-the-art studios in London's Covent Garden and NYC's Midtown West. •

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GET CONNECTED

s with all the best tech innovations, Advagym by Sony started life as a pipe dream – a project to create a piece of kit that would use the human body as a 'conductor cable' to connect two pieces of tech.

Even its creator, Henrik Bengtsson, now head of business for Advagym, admits that while the premise for the technology was revolutionary, no one quite knew what to use it for

Sony and Precor are collaborating.

Henrik Bengtsson, head of business at
Advagym, tells Wendy Golledge about
Sony's latest foray into fitness

"Back in 2015, the project was to develop a chip set, which could communicate using the body as a cable – it was called body area network technology," he explains. "One usage example was to enable someone to wear a wrist band on one arm, which would unlock their mobile phone held in the other hand. Then Apple created fingerprint ID and the idea became redundant."

It's a long way from Advagym's sleek sensor pucks, which log and save any strength workout, in real time, to a mobile app that also stores custom programmes, offering a complete tracking journey for exercisers.

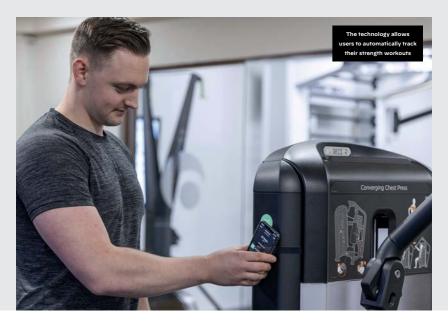
In the app, members can also log favourite workouts and preferred machine settings, add freeweight workouts, set up training plans and view workout history.

"We decided to research using this technology in the gym. Personally, I hated having my fitness programme on a piece of paper, and having to carry it around with me and fill it in after each exercise. It led me to wonder, could we use body area network technology to create a tech solution for this frustration?"

Bengtsson and his Swedish team wanted to allow consumers to wear a wrist band, which would talk through their body to a sensor on a piece of strength equipment and count reps, etc.



Bengtsson has been developing Advagym since 2015



"Our first incarnation came third in Sony's Mobile Innovation Forum competition in 2015. But in truth, the tech didn't work faultlessly and we knew it needed to in order to succeed." admits Bengtsson. "We started to really study the fitness industry, its issues, its wants, its needs and went in a completely different direction."

Trial and error

Bengtsson's background is in mobile tech. He worked for a prestigious list of telecommunications giants including Ericsson, Telia and Orange before returning to Ericsson - by then Sony Ericsson - where he headed the Sony Ericsson Research Centre.

It's perhaps unsurprising then that his research into the fitness sphere eventually led him to focus his attention on the mobile phone.

"RFID bands were out there and making some noise, but we knew the percentage of users bringing their phone into the gym space was constantly increasing. We wanted



We wanted to create a seamless solution for exercisers to use their phone to log their workout

to create a seamless solution for exercisers to use their phone to access programmes, log their workout and get instant feedback," explains Bengtsson. "Our project name was Connected Gym. After countless experiments, on 27 June 2016 I did the first Sony Connected Gym workout. There were thousands of bugs but nevertheless, it was a first. Advagym evolved from there."

A year later, in November 2017, Bengtsson met with Precor.

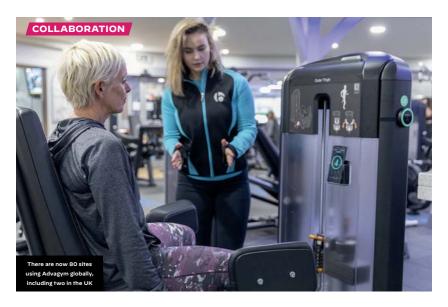
The right direction

"We knew we wanted to work closely with a top-five equipment vendor. Precor had the same mindset as us from the start," says Bengtsson. "As a company they'd already envisaged a similar solution. They understood it

must work on all machines; the ability to retrofit onto older equipment was essential and it needed a battery that lasted for several years - no gym would remodel just so our tech could have AC power, Crucially, we knew that mobile must be the interface. Our ways of working aligned with each other, right from the first meeting."

Advagym, by Sony - a new name that was trademarked in June 2018 after rigorous evaluation of more than 500 options - signed a pilot agreement with Precor at FIBO 2019, an occurrence Bengtsson describes as a "game changer".

"It was a confirmation that the efforts spent, the patent applications filed and the thousands of small and large decisions made had all been in the right direction," he says.



There are now 80 sites using Advagym globally - two in the UK so far - and the brand is fast gathering pace. To date, 350 million reps have been performed worldwide across 15 countries. Bengtsson predicts Advagym will reach a billion reps before the end of the year and he across 25 countries

"We do work with other vendors, but Precor is absolutely the one we are spending our energy with," says Bengtsson. Advagym's current functionality works seamlessly with Precor's PREVA Networked Fitness, allowing customers to log both strength and cardio workouts. Members' PREVA data is all pulled across into the Advagym app, so they can see their entire workout journey at a glance. "We are aligning our road map and will continue to further integrate Preva and Advagym," he says

In the very near future - Bengtsson hopes towards the end of Q1 - users will be able to sign into Advagym using their Precor Preva account, without having to create a separate Advagym

Members' PREVA data is all pulled across into the Advagym app, so they can see their entire journey

one. "We want an absolutely seamless interface and are working closely with Precor US," says Bengtsson.

The sensor pucks also blend seamlessly with Precor's new



'Zone pucks' play informational videos

strength line - Resolute - which Precor is planning to launch in the UK during Q2 of 2020.

New evolutions

At Precor's request, Advagym recently launched 'zone pucks' - information hubs for customers. Operators can customise these pucks to play any information video when a user

touches their phone to it, whether that's an introduction to the different PTs at the gym, guidance on the machine areas for beginners or suggested workouts for Precor's functional training rig, Queenax. Other new developments set for

early 2020 include the launch of Advagym Groups, to enable PTs or fitness instructors to contact a group of clients and send information or programming in one go, for example for bootcamp sessions. "Advagym



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We constantly update everything to ensure Advagym is always adapting to the needs of the market

runs five-week development sprints and we constantly update the apps, the web tool, and even the cloud service," Bengtsson explains. "It ensures that Advagym is always adapting to the needs of the market."

Alongside this, Advagym is working with Precor's input to develop a premium offering, to enable operators to better monetise the use of Advagym, "Currently anyone with the app can login and use Advagym and the pucks," explains Bengtsson. "Our Premium offer will enable sites to upsell it as an optional extra membership benefit, at a fee."

Finally, Advagym and Precor are working on a customisable rest timer. "Rest is an important part of strength training, but how long you should rest varies for every individual. We are developing a functionality so fitness instructors will be able to customise rest timers," says Bengtsson.

The winning formula

For operators, what are the benefits to digitising the whole gym floor?

"Advagym brings three values to the table," says Bengtsson. "At the simplest level it's just a good app which logs workouts, provides inspiration, insights and statistics. The Advagym pucks enhance members' training experience. Furthermore, Advagym is a digital platform for gyms and personal trainers to distribute workouts to their clients, to follow their results and give feedback. And every piece of research on retention says that connection is key. A US research study of 10,000 gym goers in 2014 showed that making progress, and meaningful interactions with their gym result in members staying longer. We have based Advagym on these principles from day one.

"The third pillar is that operators can monitor kit. Gyms think they know



how strength equipment is used but with Advagym operators get valuable insights about machine usage and user preferences. It could be that bicep curl machines are rarely used, for example, but cable machines are used a lot. When it is time to update the gvm that is invaluable information."

Bengtsson concludes: "Everyone carries a mobile with them nowadays. I believe Advagym is just the beginning in terms of technology's potential to help us lead healthier lives." His eventual aim? A totally seamless automated gym where every metric is logged automatically. "There's no reason why Advagym shouldn't be everywhere. What it's being used for right now is quite modest compared to its full potential." •

CASE STUDY



ne of the first clubs to install Advagym is Aberdeen Sports Village, who opted to install it on Precor's Discovery and Icarian Range as part of a £500,000 refurbishment. Health & Fitness Development Manager, Kris McIntosh, says: "Advagym sensors on our strength machines record reps and sets, with members tracking their workout in real-time and stats automatically uploaded to the app on their mobile. I've been incredibly impressed so far. To be in partnership with global brands like Sony and Precor really puts us on the map in terms of our digital offering.

"Our PTs and gym staff use the app to increase interaction with members and create bespoke training programmes. The PT Client function means my team can interact via messaging, track use and completed workouts so customers achieve their goals faster. We all know users who see progress towards their target are more likely to stay members.

"I use the system to monitor machine utilisation so I know what kit is being used, how often and when.

Our PTs and gym staff use the app to increase interaction with members

The insights into user preferences are unreal. I can run reports on every single bit of kit and make much more informed decisions. To give

vou an idea, we had over 1.8 million repetitions across the fixed weight machines throughout September these are astonishing statistics."

The highest number of reps was on the cable machine, with 147,366 reps in the first month after opening. The centre's Net Promoter Score the percentage of people who would recommend Aberdeen Sports Village to a friend or colleague - has risen to 49 per cent, which is categorised as 'great' says Kris McIntosh.





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INTERVIEW

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Lauren Foundos

The founder of FORTË - the live streaming platform taking fitness classes into people's homes - talks to Steph Eaves about how she built the business. FORTË has launched 'From our Home to Yours' to be pandemic-compliant

ith the explosion of boutique fitness during the last decade, new technology is making boutique classes more accessible and affordable by bringing them into people's homes. One platform leading the way is FORTE, which claims to be "revolutionising the fitness industry". Its founder and CEO, Lauren Foundos, is brimming with passion and energy when she tells me exactly how she developed a platform that would allow studios to extend their reach far beyond their walls. FORTË is continuing to trade through the pandemic.

"We've developed the industry's only costeffective, live-streaming technology platform optimised for the challenging fitness class environment," explains Foundos. "We install hardware and software into boutique studios, and instructors' homes, which enables their classes to be streamed live to FORTE's platform, where it can reach an unlimited number of people."

> Subscribers to FORTE receive access to a "fully-immersive, interactive, real-time fitness

> > experience with daily content covering a broad range of exercise disciplines", Classes can be accessed live or on demand.

Foundos launched her company in 2015 As I began to build friendships within the fitness industry. I realised that what seemed so obvious wasn't being done

A revolutionary idea

Foundos was working on Wall Street and struggling to fit in her workouts when she came up with the concept for FORTE, and the idea would turn out to be the perfect way for Foundos to combine her business expertise and her passion for fitness.

"I spent a decade working on Wall Street, with the last five years in finance on the trading floor as an Institutional US Government Bond Broker at Whitaker Securities," she tells.

"Working out has always been instrumental in helping me stay focused and grounded. During my university years. I was a two-time all-American field hockey player, I played in the Junior Olympics, and played in Division 1 at the University of Maryland, the nation's top ranked programme.

"However, once I began working on Wall Street, I had to be at work very early. Working out in the morning before work became increasingly difficult, so I started taking my clients to work out with me prior to our evening events. That was the catalyst for the FORTE concept."

Foundos explains that she has always been self motivated when it came to working out, steering clear of studios. But once she began dabbling. she was immediately hooked by the energy and unspoken camaraderie within the room.

INTERVIEW



"As I began to build friendships within the fitness industry, I started to realise that what seemed so obvious wasn't being done. Studios and instructors wanted to stream their content and have a digital platform, but that's costly, and streaming wasn't their strength - it's an entirely different business."

Foundos was sure that technology could bridge that gap between the boutique studios and high level instructors and those people who either don't live in close proximity to top studios or don't have the time or resources to attend or hire PTs. She set out to find a way to make it easy and affordable for them to stream their classes.

"If you want to livestream, you can build a TV studio, which is very expensive, or use Facebook Live, which costs nothing but sacrifices quality and the interactive user experience. I was adamant we could develop a platform that mirrored the high quality of content produced in a TV studio, but for a fraction of the cost.

"We spent two years developing our proprietary system, which we hard-wire into partner's facilities, enabling them to livestream through our fully-automated system."

Taking a leap

While Foundos had the idea and the business know-how, she admits she needed help with the technology side of things.

"I decided to build a tech company with very little technical experience, so the learning curve



The system switches between multiple camera angles and mixes the sound, without any human operators

was extremely steep at the start. I went on my LinkedIn and started typing in 'tech' to see who I knew in the industry. I was fortunate to find one of my brother's best friends who was heavily immersed in it, and he was instrumental in helping me to get FORTË off the ground.

"I also found an incredible women's group called Dreamers & Doers, where female founders support one another and share information. This group was pivotal as I incorporated, found payroll options, engineers, press, etc."

Foundos explains that the key to FORTE's success is that the system is fully automated. producing TV-studio quality with no human direction, and no hassle for the provider.

"The first few years of the company were dedicated to building our proprietary hardware and software. We developed it, iterated, and, after deploying it into many locations and a wide variety of different situations, we iterated again and again. After watching thousands of classes, we cracked the code and were able to successfully automate our product, so that during a livestream, it switches between multiple camera angles and mixes the trainers mic and the music, all without any human operators.







pandemic-compliant

An unknown concept

Since launching in 2015, FORTË has grown, with both studios, instructors and consumers now subscribing. In the beginning, however, people took some convincing, says Foundos.

"When I first started pitching, people were very uneasy about the idea of streaming their classes. They thought other studios or instructors would copy what they do, and that it would cannibalise their business. Fortunately today that mentality has totally evolved, and people are excited about the prospect of having a digital offering.

"It gives studios the ability to reach far beyond the confines of their walls and instructors to reach new clients. The amount of money that may be lost from one or two members switching to just streaming is heavily outweighed by the amount that streaming can bring in. Nothing replaces an in-studio experience; and when you stream, it actually drives people to your studio and builds brand awareness."

Consumers, on the other hand, have been an easy sell, tells Foundos.

"Consumers totally get it. Right now our customers are primarily people that live in and around major cities, so they are either regular

attendees at these types of studios, or have been at one time before moving out to the suburbs. As we start to market beyond this group, we may have to change our messaging and adapt.

"So far, we've spent zero dollars to acquire customers, and thankfully the product has successfully grown via word of mouth. It helps that the people who attend the classes in-studio appear in the videos - this creates virality.

A win-win model

FORTË partners with top studios and instructors across the USA, from all workout disciplines. The model requires the studios to cover the costs of hardware installation and software, then revenue is split 50/50 between FORTE and the content creator, based on minutes watched.



Foundos says that while FORTE's contract is mainly with the studio, they strongly urge them to properly compensate instructors.

"We give the studio a monthly data report that shows the most popular instructors, classes, etc., so those trainers can get credit for driving users."

Putting studios in control

As the popularity of the concept has grown, the brand has been inundated with requests from studios to appear on the platform. In response, Foundos made the decision to launch a new offering for these studios.

"We limit the amount of studios that we allow on our marketplace as we don't want to overwhelm the user," explains Foundos. "That said, we have over 1,000 gyms that have reached out to us about streaming their classes. This has led to our second business offering, a white-labeled SaaS product which allows gyms to stream their own classes both live and ondemand directly to their own website or app.

"This enables studios to leverage our automated streaming hardware and software, so they can stream their own classes and market the product as they see fit."

We give data reports showing the most popular instructors, so they can get credit for driving users

In this model, the studio pays for the infrastructure, but acquire the users themselves and collect payment directly from them - a set-up which is pandemic-compliant.

Taking fitness streaming to the world

In today's technology market, there's no time to stand still, says Foundos.

"We just completed the integration of all wearables on the market - Apple Watch, FitBit, Garmin, Polar, etc, etc," she tells. "You'll be able to track your progress in real time, and compete on our live leaderboards. Our goal is to make the product as interactive and fun as possible."

The goals for FORTË don't stop there. Foundos says plans for worldwide expansion are underway.

"Our plan is now to close our current funding round and to grow. We currently operate in the United States from coast-to-coast, and plan to also start expanding beyond the US." .



Christopher Ruddock

With real-time vibration feedback, INCUS | NOVA is a new wearable system which generates applied analytics and guides

training. Steph Eaves talks to the inventor



What's your background?

I graduated from Loughborough University with a first class degree in product design engineering. I'd consider myself a design engineer by training - this essentially means I'm a mechanical/ manufacturing engineer, but I bring this together with skills in visual and user-centric design to create products that not only work on a technical level, but look and feel great for a user.

Before INCUS, I was involved in sports engineering. I designed high performance bicycle frames and equipment for UK Sport, predominantly for British Cycling. This began while I was a student, and I took a year out as part of my degree to work full time on it.

I worked in a team of two - my boss at the time and I - in a small office overlooking a high street in Nottingham. Here we developed cutting edge cycling frames and equipment for those competing at the Olympic Games, Paralympics, and in pro teams across the world.

I was involved in designs for vellow- iersev winning bikes at the Tour de France, and

developed a new carbon tandem bicycle that has since contributed to multiple Paralympic and World Championship race wins. I also did some design work at Dyson's headquarters between studies which was useful in understanding how a larger company operates.

Where did the idea for INCUS come from?

In 2009, when I was 16 years old, I was a club level swimmer, as well as a swimming coach and I was competing in speed-lifesaving.

After a bad ear infection, I lost the hearing in my left ear, which made me acutely aware of the importance of communication when training for and participating in sport. This was what planted the seed for INCUS - a system that could improve communication in training through numbers rather than through verbal feedback.

As an engineer, I turned to technology. I considered a product that could measure useful information in swimming and improve athlete/ coach communication using data. I sat on the idea for a number of years, and it wasn't until I

The NOVA is the first ever triathlon wearable worn on the upper spine

INVENTOR

I quickly got hooked on how data could improve people's enjoyment of sport, and having demonstrated a basic prototype, I entered a competition to go to America to develop the concept as a business

was designing the bikes in 2013 that I thought again about exploring the idea further.

How did you go about developing this idea?

I took the chance to spend more time on the development by including it as an individual project through my degree and began to experiment with sensors in my bedroom, strapping homemade electronics to my back with gaffer-tape and going for a swim.

Although it was a rudimentary approach, it proved the concept that now underpins the technology we have here at INCUS.

I quickly got hooked on how data could improve people's enjoyment and engagement in sport and, having demonstrated a basic working prototype, I entered a competition to go to America to develop the concept as a business.

After a rigorous application process in the spring of 2015. I was invited to Massachusetts Institute of Technology (MIT), in Boston, USA as part of a Summer Exchange Scholarship. The trip was a pivotal step; I experienced the MIT approach to innovation and began to build the underlying business case for INCUS Performance based on their principles.

I attended MIT classes, with the core elements of the business plan tested and critiqued by MIT professors, athletes, spin out companies and entrepreneurs. It was an incredible experience.

I picked up the project again in the final year of my masters, giving me further time to refine my understanding of the problem I was trying to solve,



and the system I was building to solve it. The devices became iteratively faster, smaller, smarter and the business plan began to take shape.

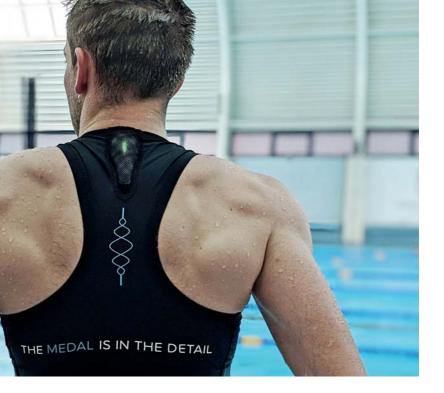
After graduating, I moved into the Advanced Technology Innovation Centre (ATIC) based on the University Science Park, and steadily built a team that has since brought the system to life.

We're still based here, continuing to develop and test pioneering triathlon technologies alongside the upcoming launch of our flagship system: the INCUS | NOVA.

What exactly does INCUS do?

It's easy to collect data nowadays, but collecting the right data, and knowing what to do with it is still a challenge for most people.

Typically, wearables will provide lots of numbers and then rely on other platforms, like Strava or similar, to process and share it. This limits the experience provided by existing



wearables and introduces a lot of complexity when trying to use data to improve.

INCUS combines better measurement with more powerful analysis under a single seamless platform to help people to collect better training data, and to use it effectively.

Our flagship product, INCUS | NOVA, is a small device you wear while you train, and it collects new, unique information about your technique to explore during or after your session. Our mobile app, INCUS | CLOUD, then shows the results in a clear, beautiful way that can be understood by technical and non-technical audiences.

Essentially, the NOVA combines a stopwatch, tempo trainer, angle measurements, power meter, and a professional note taker all in one seamless device, to provide rich performance information within seconds via your smartphone.

It's simple to use, and allows you to quickly feed back information such as body The NOVA collects important details about technique

roll/ pitch, stroke strength, split times and distances in a session, without having to deal with lots of cumbersome equipment.

How is it different from other swimming-focused wearables?

In swimming, typical wrist-based trackers will give you information such as your lap count, perhaps your stroke rate and that's about it. This information can be useful for basic tracking, but these provide little insight as to how to use the data to help you reach your goal.

The NOVA is the first ever triathlon wearable worn on the upper spine. This allows unique measurement of your left and right sides independently, rather than a smartwatch that will measure one side of your body and assumes the other side is doing the same.

This unlocks new understanding of body balance and the effect of technique, which has



never been available before. It also allows us to provide world-first swim measurements such as body angles and Velocity Gain - a measure of stroke strength on left and right sides

What we have now is the cutting edge of performance monitoring in swimming. We have already used it to provide world-first analytics in turns, technique and pacing strategy for selected athletes in Loughborough, as well as supporting prominent events such as Marathon Swims and the London Triathlon.

With the quality of the data produced by NOVA, we are able to move towards predictive analytics that proactively guide you to reach your goal. This includes our insights which, instead of simply giving you numbers, provide a clear written statement explaining what the numbers mean. This makes it quicker and easier to get the value of the numbers out, rather than suffering from what we call 'paralysis by analysis'.

Did you get any assistance to bring the product to market?

I won a student enterprise competition in my final year that gave me a small, but significant boost ahead of graduation.

I used the prize money to pay my living costs for a couple of months while I built the business case and wrote an application to Innovate UK to develop things towards a sellable product.

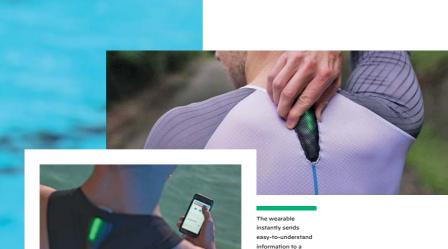
Our mission has always been to make quality analytics accessible to both amateur and elite athletes. We have a truly world-class system in our hands that we look forward to sharing

> Innovate UK is a government -backed grant scheme which is aimed at providing assistance to early stage, high technology-led projects that would otherwise find it tricky get funded.

I won the Open competition draw which provided finance and support for an 18-month project to build the system towards a commercially viable solution.

Within the 18-month term of the project, we created eleven jobs, miniaturised and improved the electronics, developed new specialised garments and automated analytics for swimming, and we developed the first mobile app, which showed the results.

We successfully delivered the Innovate project and quickly closed a private funding round



that has taken us to the point of generating initial sales and launching the product. We're now exploring options for further investment for the next phase of INCUS, which includes scaling internationally with a focus on sales.

What challenges did you face?

With a product like INCUS | NOVA, there's an awful lot that's working in the background to deliver a simple, quick and seamless experience for the user. This includes not only the device that collects the data, but the garments, the way the data is handled, sent, analysed and displayed to the user. Each of these steps brings its own challenges, and knitting all of these things together elegantly is not an easy task.

With my mechanical engineering hat on, the more challenging aspects I've come across have been involved with reliable waterproofing, while maintaining a product that still looks and feels sleek and is easy to make.

Every swim wearable struggles with this - that's why there aren't many good ones - but over the years we've learned a lot and now combine a number of techniques that deliver robust sealing and an attractive experience for our users.

That's just one of the many cogs spinning within the INCUS infrastructure, but thankfully I have an exceptional team that continue to keep things running smoothly!

Are you working on any new features?

mobile ann

Although we're just launching the NOVA publicly now, we have a range of exciting new updates coming soon that will expand the functionality of the device without needing to buy anything new.

We purposefully built in a lot of power to the NOVA hardware that we will be making use of, including things like multi-sport analytics for running and eventually cycling, links to smartwatches, heart rate monitors and other features such as our ActiveAssistance™, which provides real-time vibration feedback to athletes to assist with training on-the-fly.

We've also got some fantastic new category products and partnerships in the works, but I can't say much on that yet I'm afraid.

What kind of feedback have you had from swimmers using the product?

The feedback so far has been quite remarkable. There has been overwhelming support from athletes, press and industry experts to date, with strong reviews appearing in some of the leading triathlon magazines.

To be told by end users that the NOVA already surpasses their experience of current market leaders is excellent. It's been great to see such continued enthusiasm from those who are now using the system after having watched it grow over the last number of years.



We look forward to welcoming new people to the INCUS experience in the coming months.

What is it about INCUS that you are most proud of?

The way I've seen the people involved with INCUS develop alongside the product. We've been able to use the technology as a vehicle to provide experiences and education, not only to the INCUS team, but to students through projects and internships, and to athletes/coaches directly.

Our users are now discovering new ways of enjoying and improving their sport through what we have created, with some world-first analyses produced in swimming and many more to come. Combining STEM with sport creates tremendous opportunities to inspire, engage and connect people - I've watched as individuals have grown through challenges, both technical and personal, and it's very rewarding to have played a part in it.

Will this product change the sports of swimming and triathlon?

It sounds like a bit of a stereotype, but the NOVA literally represents a step change in swimming and triathlon technology when compared to the products currently available.

We're able to explore areas of training and technique that have never been measured before in a swimming environment, and are unlocking new opportunities, not only with the results the

Duddock says the NOVA will unlock new opportunities for swimmers and triathletes

> NOVA produces, but in the way people interact with and integrate data into their training.

Our mission has always been to make quality analytics accessible to both amateur and elite athletes and this begins with NOVA. We have a truly world-class system in our hands now, and we look forward now to sharing it with the world.

What does INCUS mean?

The name comes from three bones in the middle ear - the Incus, Malleus and Stapes - that conduct sound from our eardrum into our inner ear.

These essential bones are some of the smallest in the body, and the hearing loss I have is a result of the ear infection damaging my Incus bone.

INCUS Performance symbolises the missing piece to this puzzle, and reflects our ethos that details matter, from the details in our engineering development, to the marginal gains in training that can influence medal-winning performances. •



A new, smart exercise mask will analyse breath for a wide range of performance-related indicators, as Tom Walker explains

nlimitech, a tech startup linked to the University of Cambridge, UK, is looking to bring to market a face mask capable of recording and tracking the user's exercise data.

Unlimitech is currently waiting to secure a patent.

The wearable technology, called Smartmask, can precisely measure key aerobic and metabolic efficiency metrics, allowing the user to effectively optimise their performance.

The mask is able to measure a number of performance-related indicators – from VO2 and VO2 max to resting metabolic rate, respiratory rate and carbon dioxide production (VCO2).

It also measures air quality, respiratory quotient, respiratory rate and VT (tidal volume).

Unlimitech is headed by CEO Daniel Morales Valdivia and the team includes cycling journalist and writer Michael Hutchinson.

"The Smartmask's precision comes from tracking breath flow and composition in real-time, instead of proxies like heart-rate that 'guesstimate' metrics," said Morales Valdivia.

"The Smartmask's mobile and easy-to-breathe design make it perfect for use anywhere, and anytime.

"It has a compact, lightweight, and comfortable design that maximizes comfort and ease-of-breathe, so people don't need to worry about long training sessions in the middle of summer."

The company is supported by the Entrepreneurship Centre at the Cambridge Judge Business School – the business school of the University of Cambridge.



KRISSY CELA

O 1.8m followers

Social media is now a hugely popular way for people to access fitness inspiration, workouts and nutrition tips. Krissy Cela discovered this early on, and has expanded her instagram profile into a personal brand, with the launch of her app. Steph Eaves talks to Cela about her journey

How did you get into fitness?

I had gone through a really bad break up and was left feeling lethargic and generally unhappy. I wanted to do something for me, something that would help me to feel mentally and physically strong again, so I decided to join a gym. That was about five years ago now!

How did this lead to where you are now?

Honestly, in the beginning I was just filming my workouts in order to check my form. I was doing glute kickbacks at the gym one day and I just knew I was doing it wrong, so I asked my friend to record me so I could figure it out. From there I figured if I posted my workouts it

would keep me accountable and I could track my form and progress, but I had such a great response from it all - it was so unexpected.

My community kept growing; I had so many women reaching out for advice, so I put together my first PDF guide. I knew I could do more to help these women and my dreams were much bigger than a PDF, and that was where the idea for my Tone & Sculpt app began.

When did you fully realise the power of social media? Did you have a strategy?

I think I realised how powerful social media could be very early on my journey. My page grew quite quickly, with women across the world







looking for advice, so I knew I had a certain level of responsibility. There was no real strategy, my priority was to provide useful information that would genuinely help make positive changes to women's lives. This still remains my priority today, which I think is why my community is so strong and continues to grow.

Tell us about your new Tone & Sculpt app

It was completely inspired by my community, for every single woman who felt alone in their fitness journey, or who had been led to believe they couldn't be a part of a fitness community unless they looked a certain way.

Everyone's fitness journey is completely different, and not everyone has access to a gym or has an hour a day to work out, so we wanted to create a positive environment that everyone could be part of and benefit from. I wanted to bring real women together as a team.

What's on the app?

The app is divided into phases - these are designed to help you from the very beginning of your journey. We use the progressive overload

I've never tried to cover up my imperfections, I've been as authentic as I can be throughout

my influencer journey

method, which basically means you increase your weights over time, allowing muscle growth, to ensure that you are always developing. We have also included a weight tracking feature so you can easily monitor your progress each week.

There is such a variety, from challenges to specific body part workouts to 15 minute full body sessions for when you're in a hurry. The app offers different guides that can be done in the gym or at home. The app covers nutrition too, with over 1,000 meals that are filled with wholesome, nutritious foods. There's even a water tracking feature to make sure you keep hydrated throughout the day. Everything you need to maximise results is covered.

Have you collaborated with any gyms or fitness brands?

I've been fortunate enough to work with Women's Best - a premium supplements company - for the past two years, and it's been quite a journey. To me they are more than just a brand, like Tone & Sculpt they are all about empowering women of all different cultures.

What do you think has been the key to your success as a fitness influencer?

Just being my true self, honest and open about my journey I think has helped me the most. I've never tried to cover up my imperfections, I've been as authentic as I can be throughout my journey. I post the good times, of course, but I also share my struggles. Everybody goes through ups and downs in fitness, and in life in general. I believe that because I am transparent with this, women can genuinely relate. My community supports and motivates me as much as I do them; we really are a family.





So many people miss out on fitness because they feel too intimidated to go to the gym

How important do you think influencers are in inspiring people to get fit?

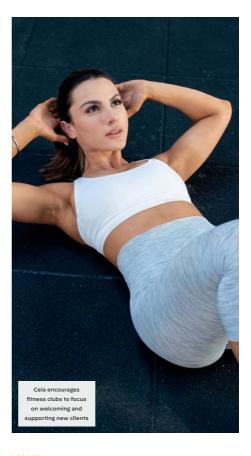
I think it's great to see so many influencers helping others to get into fitness. Having a healthy body and healthy mind is so important! However I'm a firm believer that you should be your own biggest inspiration. As much as others can guide and support you, you are the one who has to put the work in for each of your gym sessions, or make the decision to eat healthy. Becoming the best version of yourself isn't always easy so you should be proud of yourself for every step you take in the right direction.

Instagrammers are often accused of not showing the reality of how their images are created. What would you say to that?

There was definitely a time when it was popular to retouch images and strive for perfection on social media, but I think it has come a long way since then. I love seeing so many women unafraid to be their authentic selves. I totally understand that we all want to share the happy and positive moments in our lives, but not all moments are picture perfect and there is definitely a lot more awareness surrounding this now.

What advice would you give to gyms about how to inspire its members or build a community of followers?

My best advice would be to make everyone feel included. Fitness is for everybody, regardless of body type or abilities. It makes me so sad to think that so many people miss out on their own fitness journey because they feel too intimidated to go to the gym. We all start somewhere - in the beginning I went to the gym and didn't return for almost three months! That first session can be scary, even going to sign up can be scary. Make your clients feel welcome, excited, supported and empowered by each workout.



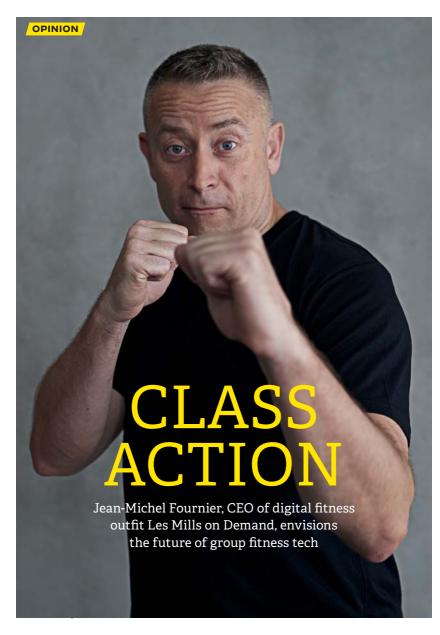
Let them know that although they are doing this for themselves, they are never alone in their journey. That's how you build a real community.

What are your future plans for your brand?

At Tone & Sculpt we always strive for the best for our clients, so the app is continuously developing. We have some exciting and innovative features coming soon. Our aim is to provide long term solutions for every body type, every lifestyle and every woman that wants to feel her best. We want to be known as an inclusive brand, so meeting the community is a big part of that. In 2020, we have many exciting events planned! •







A recent demonstration of Microsoft's HoloLens 2 showed how the device can generate high-def holograms of people and can translate speech instantly into any language. This means our fitness instructors could one day lead classes anywhere, in whatever language we require

s we start a new decade. businesses offering virtual reality (VR) and augmented reality (AR) systems are aiming to make an impact in the fitness industry.

Researcher International Data Corp forecasts spending on augmented and virtual reality will jump 79 per cent to US\$18.8 billion worldwide in 2020 and is expected to rise at a compound annual growth rate of 77 per cent through 2023.

This article will explore which technology - AR or VR - may be the long-term winner

in the fitness world - in our opinion. While the terms 'virtual' and 'augmented reality' get thrown around a lot these days, there's actually a lot of confusion surrounding these specific technologies.

VR headsets create fully immersive experiences where users leave the real-world environment behind to enter a fully digital environment.

The headsets are completely opaque. A big drawback of VR use in a gym environment is that being disconnected from your surroundings can create potential safety issues.

SUPERIMPOSED

In AR, virtual objects are superimposed onto the real-world environment via smartphones with AR apps, tablets, heads-up displays, and games like Pokémon Go! which use your phone's camera to track your surroundings and overlay additional information on top of it, via the screen.

While VR replaces your vision, AR reality adds to it. This can be as simple as a data overlay that shows the time, or as complicated as holograms floating in the middle of a room.

AUGMENTED FUTURE

We believe that in the longer-term the fitness industry will utilise advances in augmented reality and holographic telepresence, rather than VR.



Augmented reality layers virtual images onto the physical environments

AR gives users digital imagery that is experienced in the physical world. It allows people to work out smarter by adding to the real environment with computer-generated sensors.

Although there are a few effective applications for the use of VR in fitness on a one-to-one basis, we believe VR is generally too restrictive and cumbersome a technology for practical use for the masses within a fitness environment.

A number of tech heavyweights agree with our preference for AR over VR.

The key message to come out of the last Google I/O developer conference was that the company has largely abandoned its plans to push forward with the development of headsets and content for VR, effectively retiring the Daydream project and focusing instead on AR features for the Google Lens.



integration of

its workouts

technology into

Tim Cook, CEO of Apple agrees with our current view as well. Tim says "I'm excited about augmented reality because unlike virtual reality. which closes the world out. AR allows individuals to be present in the world but hopefully allows an improvement on what's happening presently."

At Les Mills we are always striving to stay ahead of the curve. This is mandatory when it comes to appealing to the two largest generation of fitness users, Millennials and Gen Z, who now make up 80 per cent of the fitness market.

Generation Active has different tastes from its predecessors - favoring working out in groups, a broader range of options and smart integration of technology - so it's vital to innovate and necessary to adapt both club and fitness offerings to win their business.

and the digital. We call it the 'consumerisation of clubs'. It means virtually expanding the four-walls of the traditional fitness facility and enabling members to exercise where and when they want. AR technology has the potential to allow for this to be done in a more seamless and inexpensive manner for the end user.

Fitness is a very human-centric industry people want to enjoy their fitness. Our internal research shows members of Generation Active prefer group exercise as a means of socialising. Therefore, the future of live class experiences could be a fusion of amazing instructors, tactile audio technology and augmented video to create immersive virtual environments.

Digital technology can boost live class users' multimedia fitness experiences through the effective use of immersive haptic audio to create tactile augmented reality.

This is achieved by layering tactile music that users can feel, on top of an immersive visual experience through the use of augmented high-resolution video that is projected for users in a wide viewing format.



A recent demonstration from Microsoft of its HoloLens 2 showed how the device can generate high-definition holograms of people and can translate speech instantly into any language, anywhere in the world. This unlocks the possibility that our favorite fitness instructors could one day appear anywhere with augmented reality headsets, in whatever language we require.

Our video streaming platform, Les Mills On Demand (LMOD), has seen significant growth in recent years and we think this kind of ondemand technology will have a huge impact on fitness as AR technology emerges and matures.

In the short-term, expect the immersive experiences pioneered by group cycling class Les Mills The Trip to expand into other class formats - both virtual and live - with highquality video enhancing the class experience.

Imagine a dance workout set against the backdrop of a cheering crowd in a sold-out stadium, or a yoga class surrounded by screens showing an alpine vista in spring. Expect to see these experiences very soon!

Augmented Reality is creating exciting possibilities for the future of fitness

79 per cent Growth in spending on AR/ VR forecast for 2020 Source: International Data Corp US\$ 18.8 billion Expected worldwide value of the AR/VR market in 2020 Source: International Data Corp 77 per cent Expected compound annual growth rate for AR/VR to 2023

UNLOCK AND ENRICH

YOUR DIGITAL POTENTIONAL WITH FUNXTION





Tesqua upgrades its in-club experience



Tesqua Health and Sports Centre, Netherlands, has partnered with FunXtion, experts in digital fitness, to create an immersive, instructordriven, group exercise boutique concept within its existing facility

e didn't just want to follow the crowd," Stuivenberg, founder at Tesqua. "We wanted to implement the very latest in digital technology so we called on the expertise of FunXtion and the end result has been incredible."

Tesqua Health & Sport Centre, in the Dutch city of Ede, has been operating since 2003. Facilities include 15 tennis courts, a 500m2 open plan workout space with a 1000m² gym with equipment, three exercise studios, a lounge and restaurant, a wellbeing suite and a creche.

"We were the first club to offer an interactive gym floor utilising the FunXtion Experience Station, which we installed in 2014. We wanted technology to be at the heart of our boutique offer, delivering an unrivalled participant and instructor experience that people will want to repeat time and time again," says Stuivenberg.

In consultation with FunXtion Tesqua has dedicated a third of its workout space to a fully immersive. group exercise 'box'. Whilst no physical walls define the area, the look and feel is very different to the rest of the workout space.

The new group exercise space launched in October 2019 and is centred around a Queenax rig, with six FunXtion multiscreen solutions positioned at each exercise station. The 48" screens deliver individual exercise instruction, creating a personal digital coach at each station,

and are linked to the audio and lighting circuits, ensuring all external stimuli create a totally immersive experience.

"The whole experience is geared towards delivering a memorable, fun and effective workout to everyone," continues Stuivenberg. "The screens add a new element to our digital provision, complementing the incumbent provision delivered via the FunXtion app and the gym floor-based Experience Station."

Mendel Witzenhausen, founder and MD at FunXtion adds: "Tesqua is a forward-thinking operator, keen to pioneer new solutions. At the Tesqua Health and Sport Centre we have created a connected digital ecosystem to provide members with easy access to fitness content both inside and outside the facility."

For more information about Tesqua visit tesqua.nl or to find out more about FunXtion visit funxtion.com •

We wanted technology at the heart of our boutique offer, delivering an unrivalled participant and instructor experience people will want to repeat time and time again



CHANGING THE GAM

Dr Kim Duffy, life sciences product manager at Vicon, says combining optical and inertial technologies will unleash a new generation of motion capture technology designed to improve performance

otion capture is well-established as an essential tool, not only for biomechanics research, but also for injury rehabilitation and training at all levels. Its importance has been reinforced by the growing numbers of sports bodies seeking to standardise and classify the various technologies available to players, coaches and teams.

For example, earlier this year FIFA, one of the world's most powerful governing bodies in sport, announced a new global standard for Electronic Performance and Tracking Systems (EPTS). As part of its Quality Programme, the new FIFA standard not only sets the highest bar possible for technology vendors, it also helps club and national teams navigate the market, giving guidance to users on best practice in data capture, output and analysis.

This is a major milestone. For such a high profile body to take this step truly underlines the value of technology to maximising athletes' performance and minimising risk of injury.

The science doesn't stand still however The question is very much what comes next.

THE RISE OF INERTIAL DATA

Although FIFA has taken a lead on this issue, the fact is the need to understand performance and improve tailored care for athletes is a major priority for every sport. It's why we're seeing motion capture used more and more widely - from football to swimming, tennis to golf, athletics to basketball, as well as baseball, cricket, long jump, and weightlifting.

This increasing adoption also comes at a time when the research and development of motion capture technology is accelerating. Traditionally, motion capture has meant 'optical' camera-based systems - with markers used on the body to track the position and motion of joints and limbs.

But now, with the enhanced specification and miniaturisation of sensors, plus lower costs, we are seeing the rise of lightweight, easy-to-use, flexible and reliable wearable 'inertial' systems. These use a combination of accelerometers and gyroscopes to capture more data on joint impacts,





Traditional camera-based motion capture uses markers on the body

limb movement and limb loads, enabling access to new insights and into athlete performance.

The capabilities of some of the latest devices are remarkable. Of particular interest is the breakthrough in exceeding previous accelerometer threshold limits - enabling fieldbased inertial measurement of impacts and loads up to 200g. By capturing the highest speed and highest impact sporting movements, researchers and coaches are able to quantify and gain a better understanding of key movements such as cutting, deceleration, landing and sprinting.

THE POWER OF INTEGRATION

Reducing guesswork and risk, the availability of more data is enabling the sector to set clearer goals and to create uniquely personalised training regimes for athletes.

However, while optical and inertial capture technologies can be used as standalone systems for focused applications, the future lies in how combined inertial and optical motion capture will help deepen our understanding of the performance assessment and rehabilitation of athletes.



By fusing optical and inertial technologies, it is possible to make the whole greater than the sum of its parts and reap huge analytic benefits. While optical technology has traditionally been limited to the lab, inertial technology takes motion capture technology out to the field. While inertial data can be analysed in real-time during a training session, bringing the most accurate, real-life data from outside into the lab for further study will bring a new depth to biomechanics research.

Alternatively, it is also possible to capture both inertial and optical data simultaneously in the lab. This gives analysts and coaches the most comprehensive picture. However, the real prize will be combining optical and inertial technologies in the field - and this is where we are seeing some of the most exciting research today.

Already it is possible to see real-time inertial data feeds alongside live video outputs from camera systems. But there is so much more potential. That might be in the form of different data visualisations - increasing the ability of coaches and athletes to have rapid access to clearly understandable and actionable tracking results - or it might be in the form of more

Real-time feedback must become the new normal as tech evolves

automated audio or visual cues delivered via apps that will give prompts to coaches when a certain joint range has been achieved, for example.

These developments will be the key to tailoring training sessions and honing techniques on the fly. It is particularly the case in high-performance rehabilitation settings. Being able to relate data to real world performance and symptoms, thereby allowing confirmation or modification of subsequent load, will give coaches far more control to optimise every training session.

Real time feedback must become the new normal as human-sensor technology continues to evolve. As such, the combination of optical and inertial technologies will contribute to the improvement of athletes and increase their availability for games - ultimately improving teams' sporting and commercial performance.

"

We cannot lose sight of the most important people in this equation – the athletes. We must ensure this data and technology delivers benefits to them



Although we are still in the early days of understanding of how these two motion capture technologies will work together, progress is likely to be rapid. There is an increasing demand on athletes to push the limits of performance and remain injury free and, as such, there is a huge incentive to have better data with which to make assessments and plan training regimens.

However, for all the technological development, we cannot lose sight of the most important people in this equation – the athletes. While researchers are looking for more and more data to deepen their understanding of human movement, we must ensure that this data and the technology delivers benefits to the athletes.

The athletes themselves – who, after all, are doing all the hard work – must have confidence that they are making progress and that their sessions and drills are being performed at the right rate to aid a good recovery, or further improve their performance. It is crucial that we get buy-in from the players themselves, their coach, and physiotherapist. It truly is a collaborative effort. •



TONI KNOWLSON

The digital innovation lead at Amazon Web Services, Australia and New Zealand, talks to Steph Eaves about smart balls, Formula 1 and fan engagement

How is Amazon Web Services changing the sports industry?

Amazon Web Services is working closely with local and global sporting organisations that are using AWS cloud, Artificial Intelligence (AI), and Machine Learning (ML) technologies to reimagine the sporting experience, deepen fan engagement, and achieve meaningful data insights to help athletes perform better.

In Australia, there are already promising examples of young local companies using AWS to innovate. Working from his garage, the owner of Queensland-based Sportcor, Ben Tattersfield, used AWS cloud to create a smart ball concept that can be used for cricket, golf and athletics and which displays useful details, including its spin and speed during play.

Tattersfield's company is also planning to roll out its technology for other ball sports such as netball and rugby, as well as integrating it into equipment, such as helmets.

AWS also powers the data-driven sport of Formula 1 racing, During each race, 120 sensors on each car generate 3GB of data, and 1,500 data points are generated each second. Using our ML technology, Amazon SageMaker, Formula 1's data scientists are able to train deep-learning models, which learn from 65 years of historical race data, to extract critical race performance statistics, make race predictions, and give fans

These insights give fans access to the inner workings of their favourite teams



Toni Knowlson is digital innovation lead at AWS in Australia and New Zealand

an insight into the split-second decisions and strategies adopted by all the teams and drivers.

By streaming real-time race data to AWS using Amazon Kinesis, Formula 1 is able to capture and process key performance data for each car during every twist and turn of the race circuits. Then, by deploying advanced machine learning via Amazon SageMaker, Formula 1 can pinpoint exactly how a driver is performing and whether or not any drivers have pushed themselves over the limit. By sharing these insights through television broadcasts and digital platforms, Formula 1 is giving fans access to the inner workings of their favourite teams and drivers.



Is AWS working on any exciting new projects?

We're working with Swimming Australia to identify innovation opportunities by leveraging big data technologies to collect, analyse, and share data, that can then be used to drive new projects that will bring swimmers, fans, and the community closer to the race action.

With AWS, Swimming Australia aims to optimise athlete performance at critical junctures of the race, create new swimming meet formats, connect the national tribe of swimmers to better identify talent, and provide more meaningful fan experiences.

How is tech changing the experience of sport - both for athletes and fans?

The emergence of cloud technology has helped drive faster adoption and real-world use of AI and ML technologies. Data analytics is definitely changing the way fans are consuming the sporting experience. Customers can integrate AWS AI and ML technologies into their applications now without having to purchase expensive, high performance technology hardware, and can get started in minutes, with no long-term commitments, and only pay for what they use.

For example, the NFL is working with AWS to power its player tracking programme, which is called Next Gen Stats (NGS). It uses sophisticated tracking technology collected via RFID devices in the shoulder pads of every



Sportcor's Smart Ball can measure spin and speed

player and embedded at each of its stadiums. These devices capture data about which players are on the field at a given moment, their location to within inches, and the speed and direction in which they move. This treasure trove of data represents a tremendous resource for the league's 32 teams, multiple media partners and approximately 180 million fans worldwide.

Powered by Amazon SageMaker, the NGS platform allows the NFL to quickly and easily



Using AWS, Formula 1 can capture key performance data for each car

The results help fans understand why some passing plays are more difficult than others

create and deploy ML models capable of interpreting gameplay. One example is NGS's Completion Probability metric, which integrates more than 10 in-play measurements, ranging from the length and velocity of a specific pass to the distance between the receiver and the closest defenders - as well as the quarterback and nearest pass rushers.

Using Amazon SageMaker to build, train and run these predictive models helped reduce the time it takes to get to results by as much as 12 hours down to 30 minutes. The results help fans understand why some passing plays are more difficult than others and provide a more meaningful understanding of the game itself. These insights can quickly be used by the NFL and its media partners to enhance broadcasts and online content, or even to educate and excite fans inside the stadium.

Additionally, the NFL can then take these insights and apply them to different parts of the

The NFL collects data from RFID devices in players' shoulder pads



plans and finding ways to improve player safety.

Tell us about your work with Kayo

Kayo is offering new kinds of viewing experiences, such as personalised live streaming and video catch-up functionality, using AWS services - including AWS Elemental Live encoding and Amazon CloudFront. For example, Kayo SplitView offers up to

four events or camera angles on one screen



enabler in ensuring sporting organisations remain relevant

Kavo is a new way for Aussies to experience sport

they want to be the first to be in on the action. follow their favourite teams, and consume sports from anywhere and on any device.

Cloud technologies provide the scalability to stream events live or host heavy data workloads and draw actionable insights through analytics.

on selected devices, while Kayo Key Moments captures highlights from matches, so sports fans can get straight to the action they want to watch.

Kayo provides a new way for Australians to experience sport, offering over 30,000 hours of content and game-changing features. with more than 50 sports events steamed instantly from Australia and other countries for viewing on iOS and Android mobile devices, laptops and PCs, and on TVs with Telstra TV, Apple TV and Chromecast Ultra apps.

The Kayo network is powered by Fox Sports Australia, ESPN, and beIN Sports.

What will sport look like in the future?

The future of sports will increasingly be more data-driven and powered by cloud technologies. With fans becoming more digitally connected,

Where can this technology take us?

We see this technology as an enabler in improving customer outcomes and ensuring sporting organisations remain relevant.

We're entering a golden age of AI and ML and believe AI will revolutionise almost all aspects of technology - making it easier to do things that currently take considerable time and effort, such as deriving data insights to increase fan engagement and enhancing athlete performance.

It can also power everything from personalisation, language understanding, and computer vision, to big ideas like self-driving cars.

The cloud has spurred researchers and developers to experiment with new algorithms in deep learning and we'll see advances in reinforcement learning and the auto-tuning of models across a wide variety of domains. even beyond the sporting arena.

NEW LAUNCH





Sexual wellness enters the mainstream with the launch of new Lover app

personalised Sexual wellness app has been launched with the aim of improving people's sex lives. Called Lover, the San Franciscobased start-up is aiming to take the taboo out of sexual wellness and stand out from rivals by providing practical, science-based strategies customised to each user's sexual type.

"We want to do for sexual health what apps like Calm and Headspace have done for mental health - empower users, start a new conversation and move the subject into the mainstream," says Jas Bagnieswki, co-founder and CEO.

In addition to Bagnieswki, Lover's other two founders are CMO Nick Pendle, the entrepreneur who founded Eve Sleep plc, and Stanford psychologist Dr Britney Blair, who works as chief science officer. Blair is board-certified in sexual medicine and the founder of Northern California's largest independent sexual health clinic.

Lover provides guidance in the form of video and audio content, plus exercises,

games and a sexual profiling tool developed by Blair with a team of sexual medicine experts. This identifies users as one of 12 common sexual types to customise advice.

"People are hungry for better guidance on their sex lives and we want to deliver this, using knowledge based on the latest scientific research," says Blair,

The start-up has announced a US\$5m seed round led by Lerer Hippeau, Additional investors include Sean Rad, co-founder of Tinder; Manta Ray Ventures; Global Founders Capital; Fabrice Grinda and Jose Marin.

"As other areas of wellbeing, like mental health, shake off their stigma and enter the mainstream, we believe that sexual wellness is a natural extension of the conversation," says Ben Lerer, managing partner of Lerer Hippeau.

Lover has a basic version free to download, a premium monthly subscription costing US\$59.99 (£48, €54) per year, or a standard subscription for US\$9.99 (€9, £8) per month. The app is available on iOS, with Android to follow.

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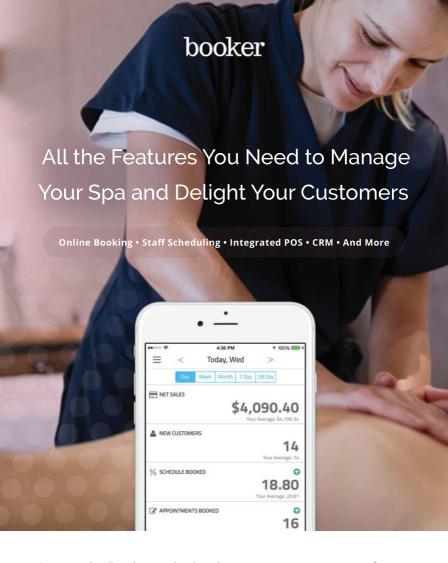
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