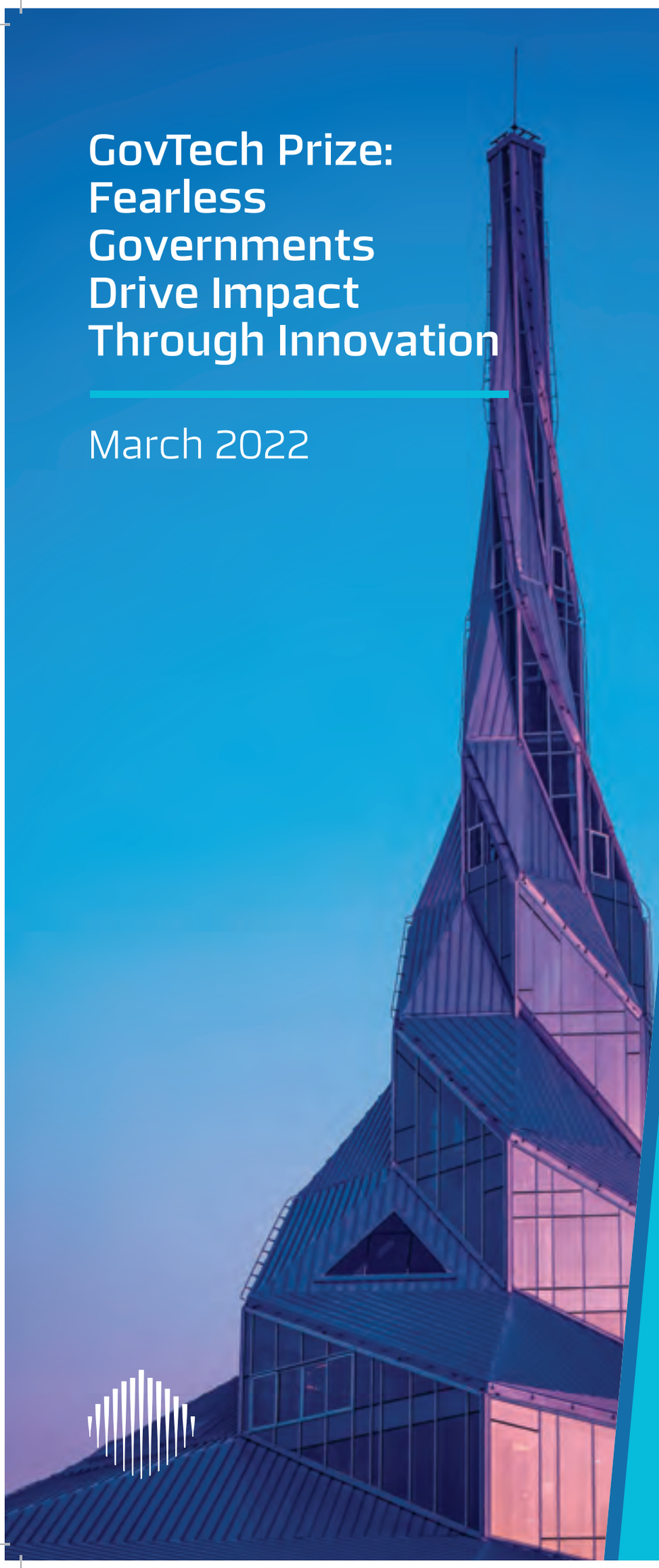


GovTech Prize: Fearless Governments Drive Impact Through Innovation

March 2022

جائزة تكنولوجيا الحكومات
GOVTECH PRIZE

WORLD GOVERNMENT SUMMIT 2022

in collaboration with

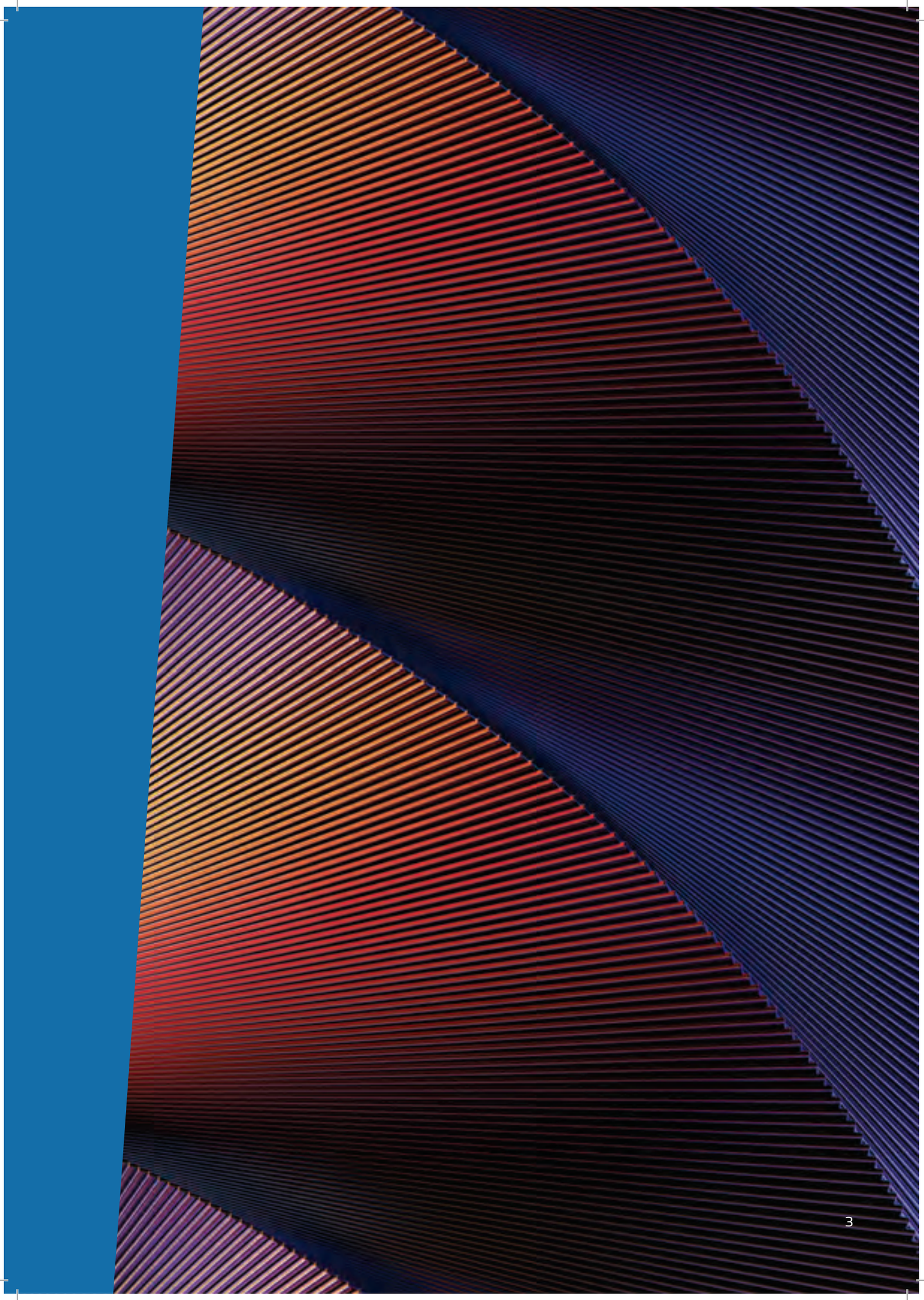
KEARNEY

To Inspire and Enable **The Next Generation of Governments**

The World Government Summit is a global platform dedicated to shaping the future of governments worldwide. Each year, the Summit sets the agenda for the next generation of governments with a focus on how they can harness innovation and technology to solve universal challenges facing humanity.

The World Government Summit is a knowledge exchange center at the intersection of government, futurism, technology, and innovation. It functions as a thought leadership platform and networking hub for policymakers, experts and pioneers in human development.

The Summit is a gateway to the future as it functions as the stage for analysis of future trends, concerns, and opportunities facing humanity. It is also an arena to showcase innovations, best practice, and smart solutions to inspire creativity to tackle these future challenges.



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Topics

Introduction

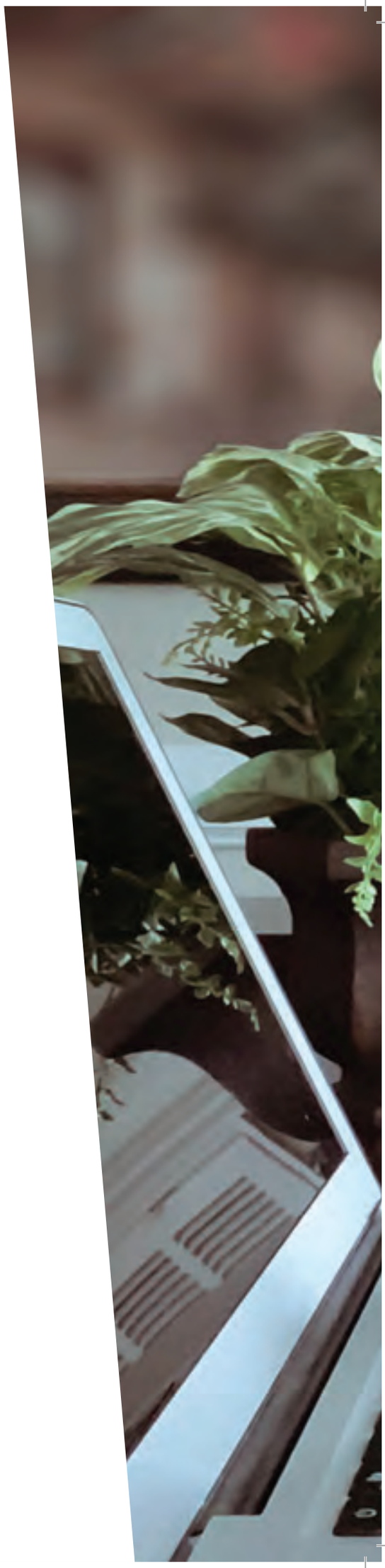
Encourage Governments to be “futuristic” and at the forefront of change

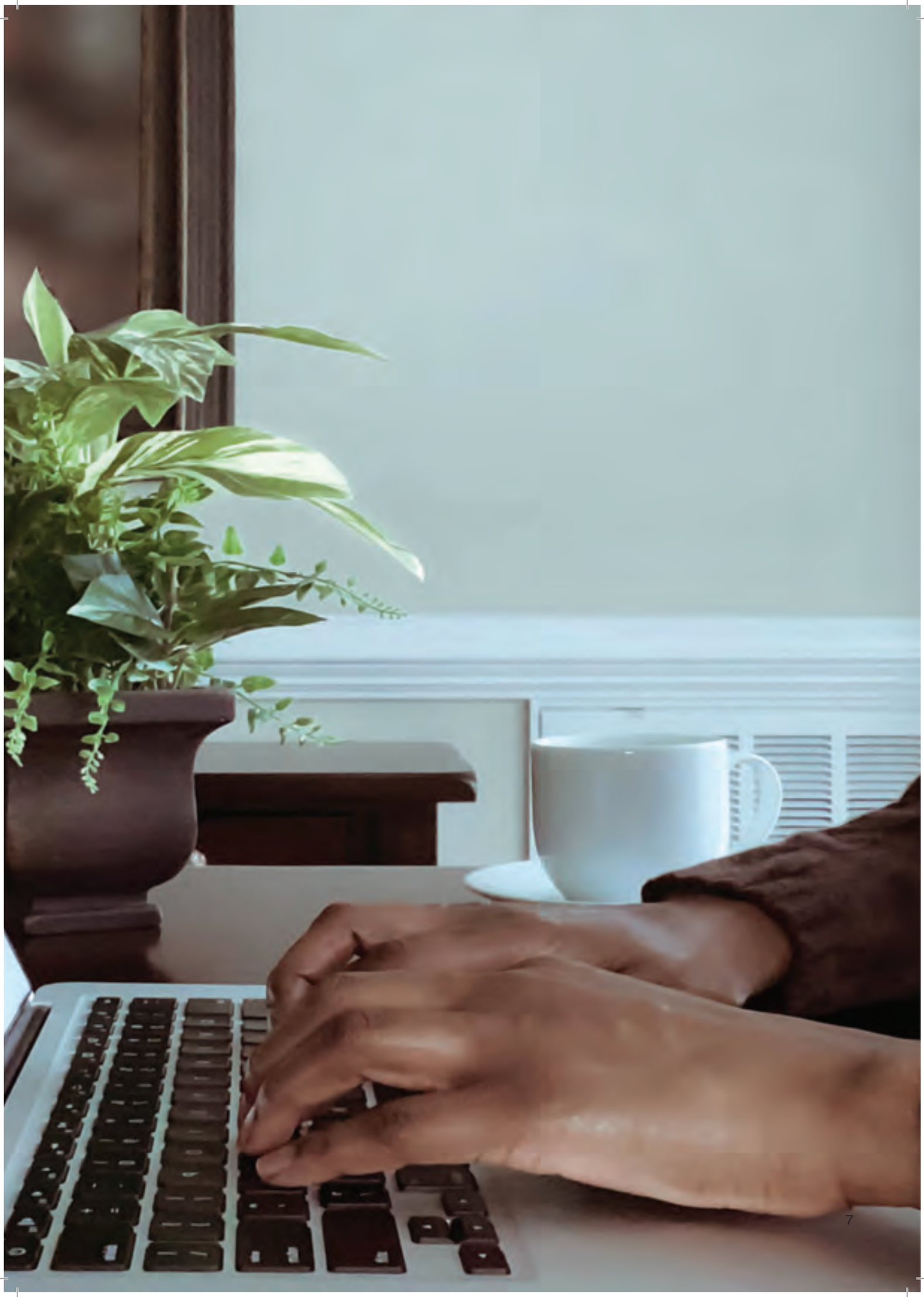
Governments around the world are shifting focus toward embracing innovation as an engine to serve humanity in the best possible way, with the role to unleash potential for business, philanthropy and people to thrive. Governments must be continuously planning for a 20-50 years horizon to address the complex problems of today.

The GovTech Prize recognize those fearless Governments that exhibit boldness in adopting the latest technologies in their aim to tackle some of the toughest challenges.
Through this study, the UAE Prime Minister Office aims to accomplish several key objectives:

- Showcase innovative government-related initiatives that have a strong impact and help address evolving local and global challenges
- Recognize innovative governments that have been at the forefront of innovation and encourage their efforts
- Inform World Government Summit community about the bold innovations that could be replicated globally

While innovation is a continuously evolving journey, it is important to recognize these bold step taken by governments towards major societal impact.





Approach

The journey to finalists' selection

Selecting the best ideas

The 2022 GovTech Prize is structured along several themes:

- **Health and Wellbeing:** address and improve physical, mental, and social wellbeing of individuals
- **Refugees:** support and facilitate refugees' quality of life
- **Climate Change:** contribute to initiatives aimed to protect the environment
- **Remote Learning:** push the learning agenda particularly in the midst of the latest pandemic through innovative solutions
- **AI Powered Government Services:** streamline, expand and improve the government-citizen interaction model through Artificial Intelligence based solutions
- **Unique Breakthroughs:** adopt technology to address issues related to other areas in a unique and distinctive way

In order to establish the finalists and best candidates for each thematic area, a 3-steps approach was followed.

Approach

The journey to finalists' selection

A. A research process was kicked off, aiming to explore innovative solutions adopted or supported by Government entities across the defined thematic areas. The research covered innovation reports, Government entities publications and other material with the purpose to identify relevant case studies. The outcome yielded a long list of 250+ cases for the selected themes across more than 60 countries worldwide.

B. The long list of case studies was analyzed and evaluated across five main dimensions:

- **Level of innovation:** measuring the adoption of novel approaches and techniques leveraging technology to provide solutions in a streamlined and more efficient manner
- **Impact:** describing the ability for the solution to solve sticky problems affecting a large part of the population, providing tangible benefits
- **Maturity:** evaluating the readiness and robustness of the solution and its level of adoption
- **Scalability and replicability:** assessing the possible extension and adoption of the solution to broader audiences/geographies and/or other contexts
- **Sustainability:** considering both the cost-effectiveness and financial viability of the solution, as well as its ecological impact and footprint

This approach narrowed-down the long list of case studies to 90+ across all themes. It is noteworthy to mention that a flexible appraisal methodology was adopted to also consider, for example, case studies with high level of innovation, but where impact has not been yet measured at scale, with a promising potential to create strong disruption. This flexibility helped to keep in sight solutions that otherwise could have been discarded despite the existence of unique and distinctive traits.

C. As a result, an independent panel of experts selected and studied in detail 42 cases to recognize in this report and to be nominated for the GovTech Prize 2022.An independent jury will select the winners for each theme of the Prize.

Approach

The journey to finalists' selection

Figure 1
Approach to select finalists and winners

A

IDENTIFY RELEVANT CASE STUDIES ACROSS THE SELECTED THEMATIC AREAS

— Research across innovation reports, Government entities publications and other material
— 250+ case studies identified

B

EVALUATE ACROSS A SET OF GIVEN CRITERIA

— Refinement of identified cases based on level of innovation, impact, solution maturity, scalability and replicability, sustainability
— 90+ case studies identified

C

FINALISTS AND WINNERS THROUGH A PANEL OF EXPERTS

— 7 case studies shortlisted for each thematic area, 42 cases in total
— Winners selected by an independent Jury

Health and Wellbeing

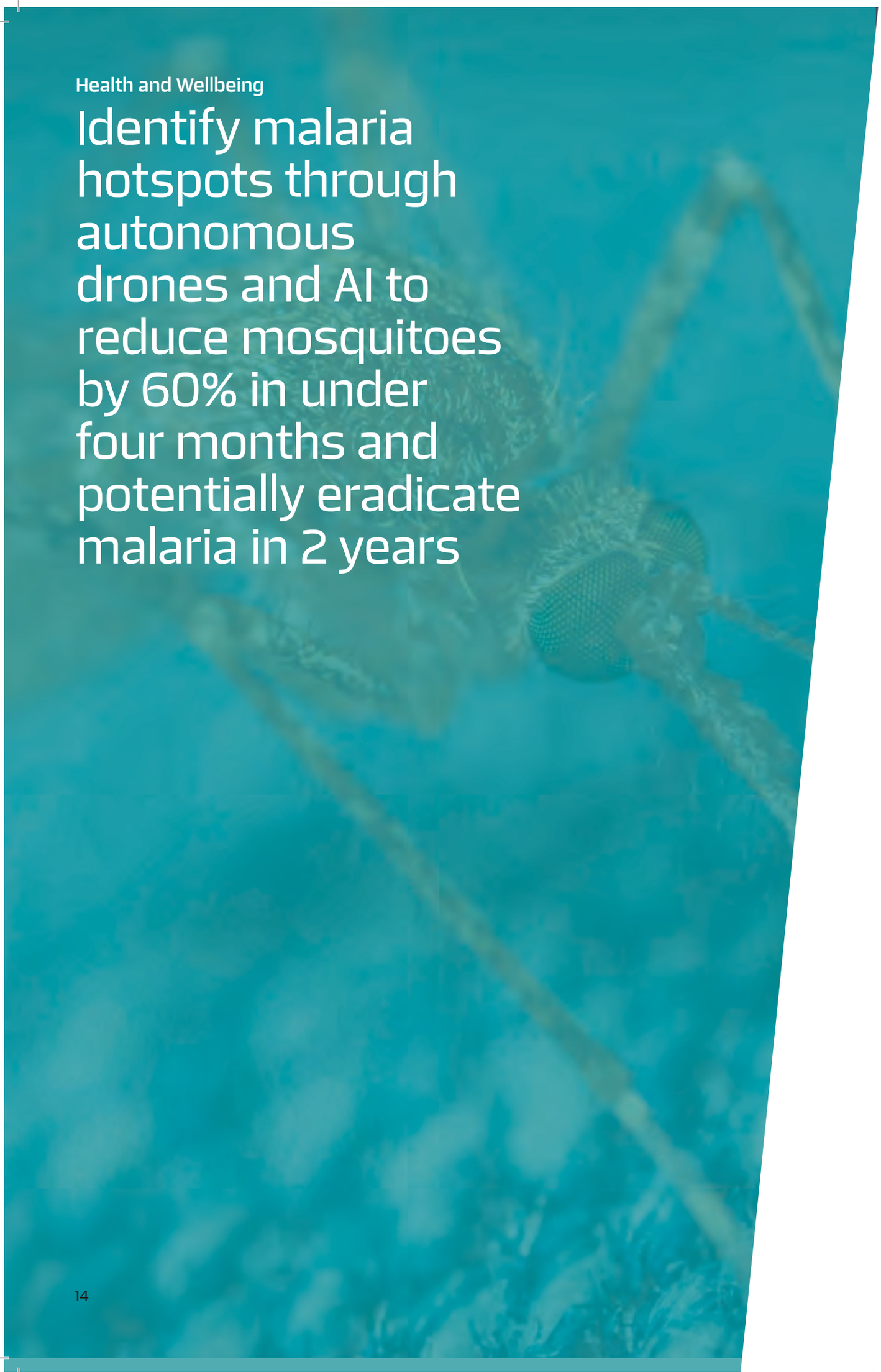
How fearless Governments anticipate citizens' health and wellbeing needs

Mastering technology to offer innovative health services

Science and innovative technologies are essential factors to the development and improvement of the healthcare system. COVID-19 recently pressed public entities to fully embrace new solutions to assist citizens and provide remote services.

To offer better services to the population. Innovative solutions based on AI, 3D printing, robotics, etc., are available to citizens, enhancing quality of provided services and increasing impact across population.

This trend is growing and the report is showing how in certain domains Government entities are pioneering research and are at the forefront of innovation.



Health and Wellbeing

Identify malaria hotspots through autonomous drones and AI to reduce mosquitoes by 60% in under four months and potentially eradicate malaria in 2 years

Health and Wellbeing

Malaria Eradication Project

Malaria is widespread in the tropical and subtropical regions existing in a broad band around the equator, where over 400,000 people die every year due to a preventable and treatable disease. Malaria is commonly associated with poverty and has a significant negative effect on economic development.

The Malaria Eradication Project is based on Zzapp and Airobotics solutions that, by analyzing satellite images and topographical maps, identify malaria transmission hotspots and optimize elimination strategies for each area with the ability to reduce mosquitoes by 60% in under four months in controlled areas.

Description

Malaria is a preventable disease spread by the anopheles mosquito. According to the World Health Organization, there are over 220 million cases of malaria every year, causing over 400,000 deaths – 67 percent of which are children under five. Nearly half of the world's population is at risk of Malaria, with the WHO African region accounting for almost 95 percent of world malaria cases and deaths.

Zzapp Malaria has developed an AI platform which designs, operates, and monitors large-scale operations to eradicate malaria by mass treatment of mosquito breeding grounds.

Entity

The Ministry of Health of São Tomé and Príncipe

Region and location

Africa – São Tome and Principe

Core technology

Mobile app supported by Autonomous Drones and Artificial Intelligence

Health and Wellbeing

Malaria Eradication Project

The company's solution combines an AI platform and a GPS-based cellular app suited to field conditions in Africa (minimal power usage and independence of cellular signal).

Their partnership with Airobotics sees the latter using autonomous drones to provide fast, detailed mapping of standing water bodies in the capital, São Tomé. Autonomous drone solution enables video, mapping and survey real time and post mission data analysis as well as emergency delivery and other capabilities.

The cost of the operation is estimated in a mere $0.2 per person protected, compared to $5 for house spraying.

Since São Tomé and Príncipe is an island country, with a limited amount of travel from other malaria endemic countries, it is a great candidate for elimination. The project is also a good chance to test the proposed technology in a variety of environments, including mountains, beaches, urban centers and remote villages. By demonstrating the capabilities of the system on a large scale, the program hopes to obtain the evidence required to encourage adoption of the technology by additional countries, paving the way for malaria elimination throughout the continent.

Link 1 – Drones News Africa
Link 2 – Zzapp Web Site

Heart 3D modelling solution, fueled by Artificial Intelligence, to diagnose life-threating coronary heart diseases in just twenty minutes

Health and Wellbeing

HeartFlow

Coronary Heart Disease (CAD) affects millions of people around the world and is the leading cause of death in the UK. It occurs when coronary arteries struggle to supply the heart with enough blood, oxygen and nutrients. Today's methods to diagnose CAD rely on traditional methods such as ECG, exercise stress test, CT scans, and provide moderate support pre-operation.

HeartFlow Analysis AI provides a cutting-edge solution to patients and doctors creating a personalized 3D model of the heart to understand where the blockage is. To date it has been used to aid more than 75,000 patients.

Description

Coronary Heart Disease is characterized by the narrowing or complete blockage of the coronary artery – the blood vessel leading to the heart – increasing the risk of heart attack.

The HeartFlow Analysis streamlines the diagnostic experience for patients – often eliminating invasive diagnostic procedures for those who do not need them. It also helps ensure those who do need invasive procedures are swiftly and accurately diagnosed.

Entity

National Health Service England (NHSE) and NHS Improvement

Region and location

Europe – United Kingdom

Core technology

3D modelling through Artificial Intelligence

HeartFlow

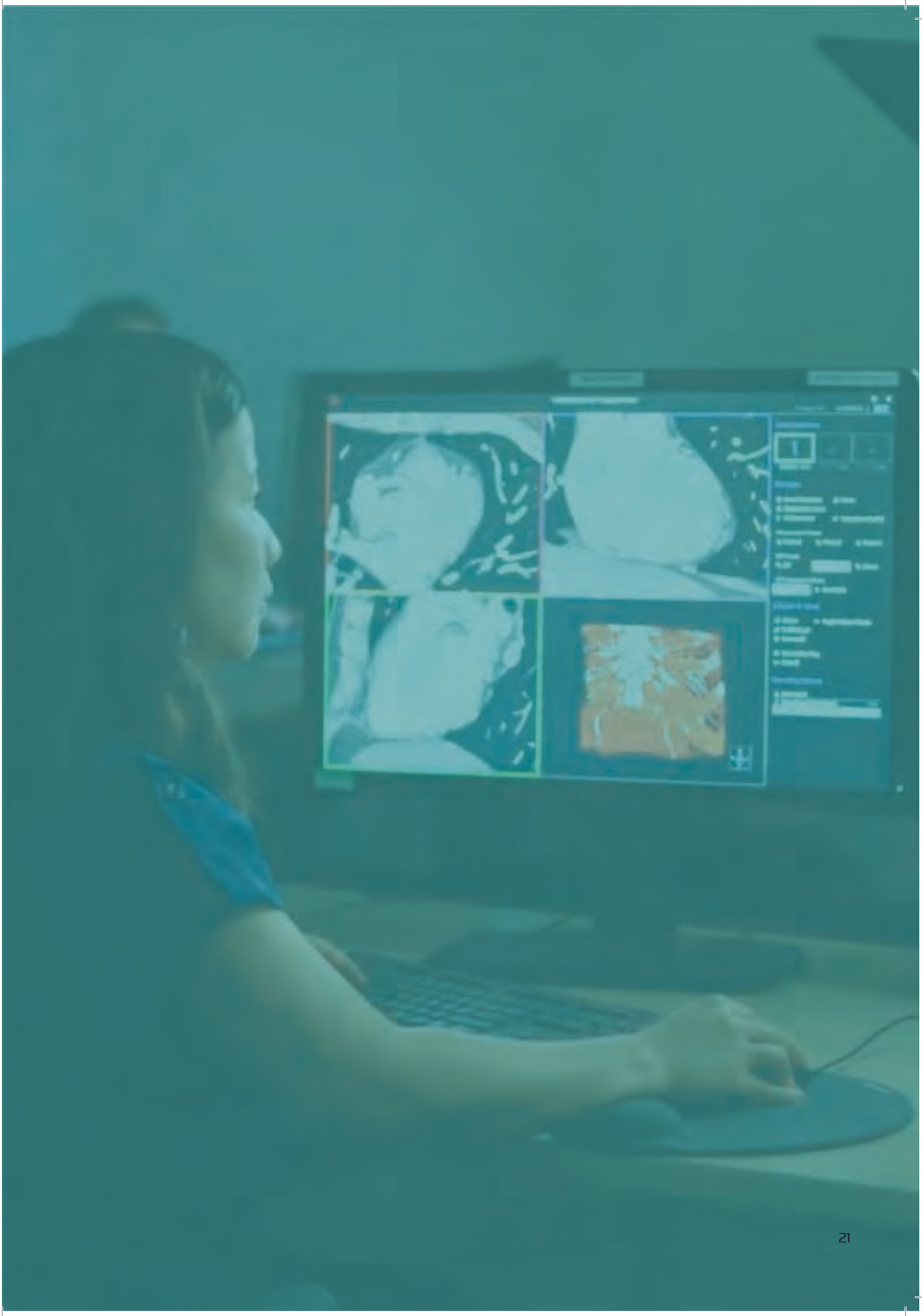
The technology limits redundant non-invasive diagnostic testing, reduces patient time in hospital and face-to-face clinical contact, and helps ensure that hospital visits are streamlined, which is particularly crucial during the Covid-19 pandemic.

The HeartFlow Analysis is a non-invasive, cardiac test for stable symptomatic patients with CAD, the leading cause of death worldwide. Starting with a standard coronary CTA, the HeartFlow Analysis leverages deep learning and highly trained analysts to create a digital, personalized 3D model of the heart. The HeartFlow Analysis then uses powerful computer algorithms to solve millions of complex equations to simulate blood flow and provides FFRCT values along the coronary arteries. This information helps physicians evaluate the impact a blockage may be having on blood flow and determine the optimal course of treatment for each patient.

The impact is very significant to both patients and doctors: 4 out of 5 patients who have a HeartFlow Analysis avoid the need for further invasive testing. This enables to treat patients more quickly, leading to an improved patient experience and has had a positive impact on waiting times for other non-invasive stress tests.

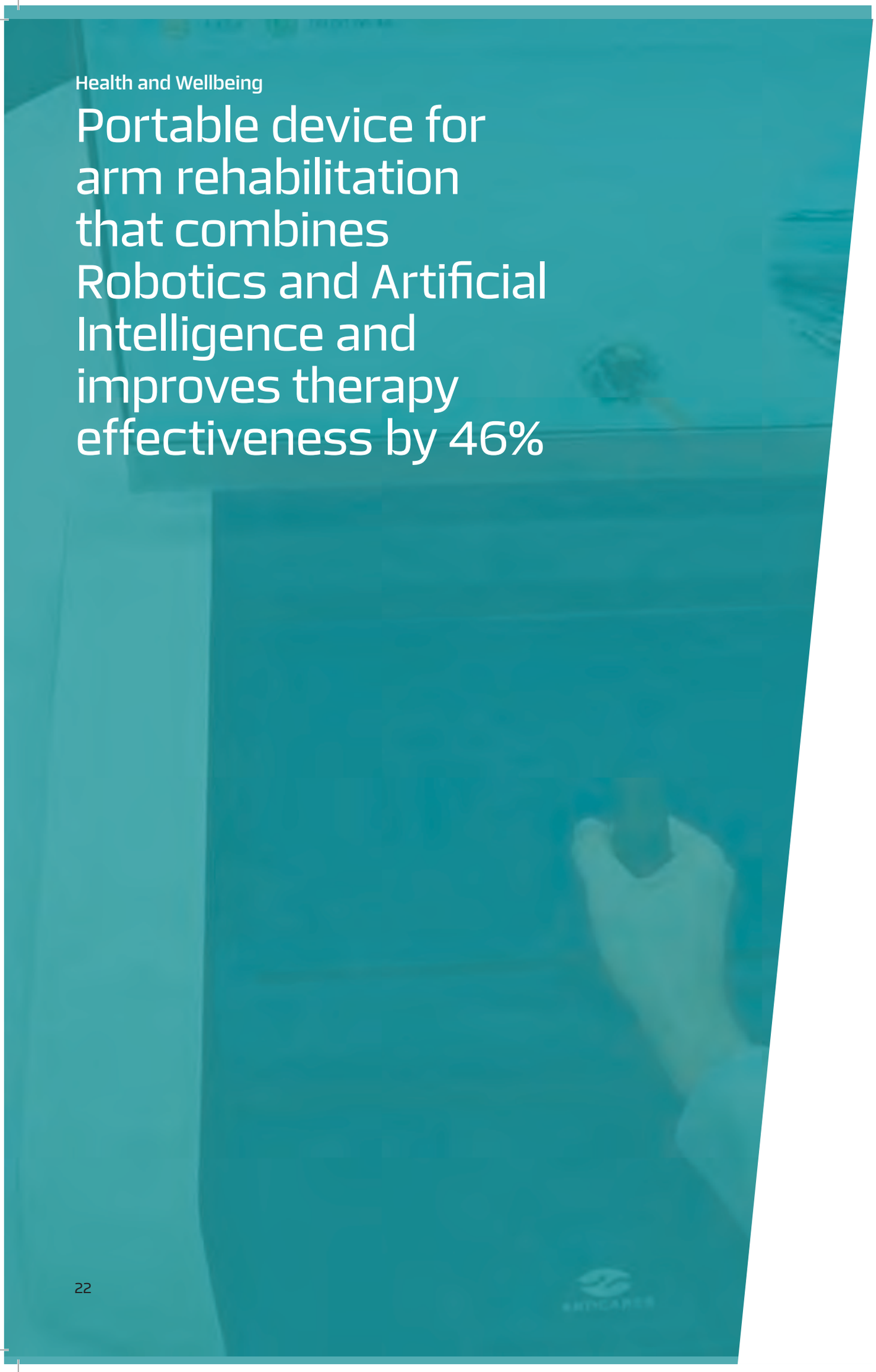
Around 100,000 people are eligible to use HeartFlow over the next three years, with more than 35,000 people set to benefit each year.

Video – YouTube
Link 1 – AIthority



Health and Wellbeing

Portable device for arm rehabilitation that combines Robotics and Artificial Intelligence and improves therapy effectiveness by 46%



Health and Wellbeing

H-Man

Telerehabilitation refers to the virtual delivery of rehabilitation services into the patient's home. Patient demand for alternative means of care has skyrocketed during the pandemic. At the height of the pandemic there was a reluctance to access many health services in person unless it was for a serious illness.

Today H-Man provides a solution to this problem. H-MAN is the first truly portable, clinically validated arm rehabilitation device; With H-MAN, users can experience quality and independent training at the comfort of their home. This portable arm rehabilitation robot can improve therapy effectiveness by 46%.

Description

COVID-19 has widely affected delivery of health care. Social distancing measures, vaccines, and other restrictions have made it difficult for patients to reach hospital or private practices to undergo treatment.

Medicine has adapted to this paradigm shift and, in response, telerehabilitation (TR) has emerged as a valid and alternative care model.

However, TR does not come without its own set of challenges

- Reluctance to accept TR as a valid form of rehabilitation
- Complicated technology – not easily understood /used by the patient

Entity

National Healthcare Group

Region and location

Asia – Singapore

Core technology

Robotic platform supported by Artificial Intelligence

H-Man

- Outdated technology – usually heavy, old-looking equipment not easily transportable;
- Complicated governance for companies providing the service

National Healthcare Group in Singapore together with the help of Articares have a solution to this problem by providing H-Man, a personalized arm rehabilitation robot for ageing populations suffering from neurological injuries such as stroke. This project is innovative because it is a foray into robotics-assisted telehealth rehabilitation. It combines AI and robotics to remotely assist patients and allowing them to perform intensive exercises without visiting hospitals or clinics.

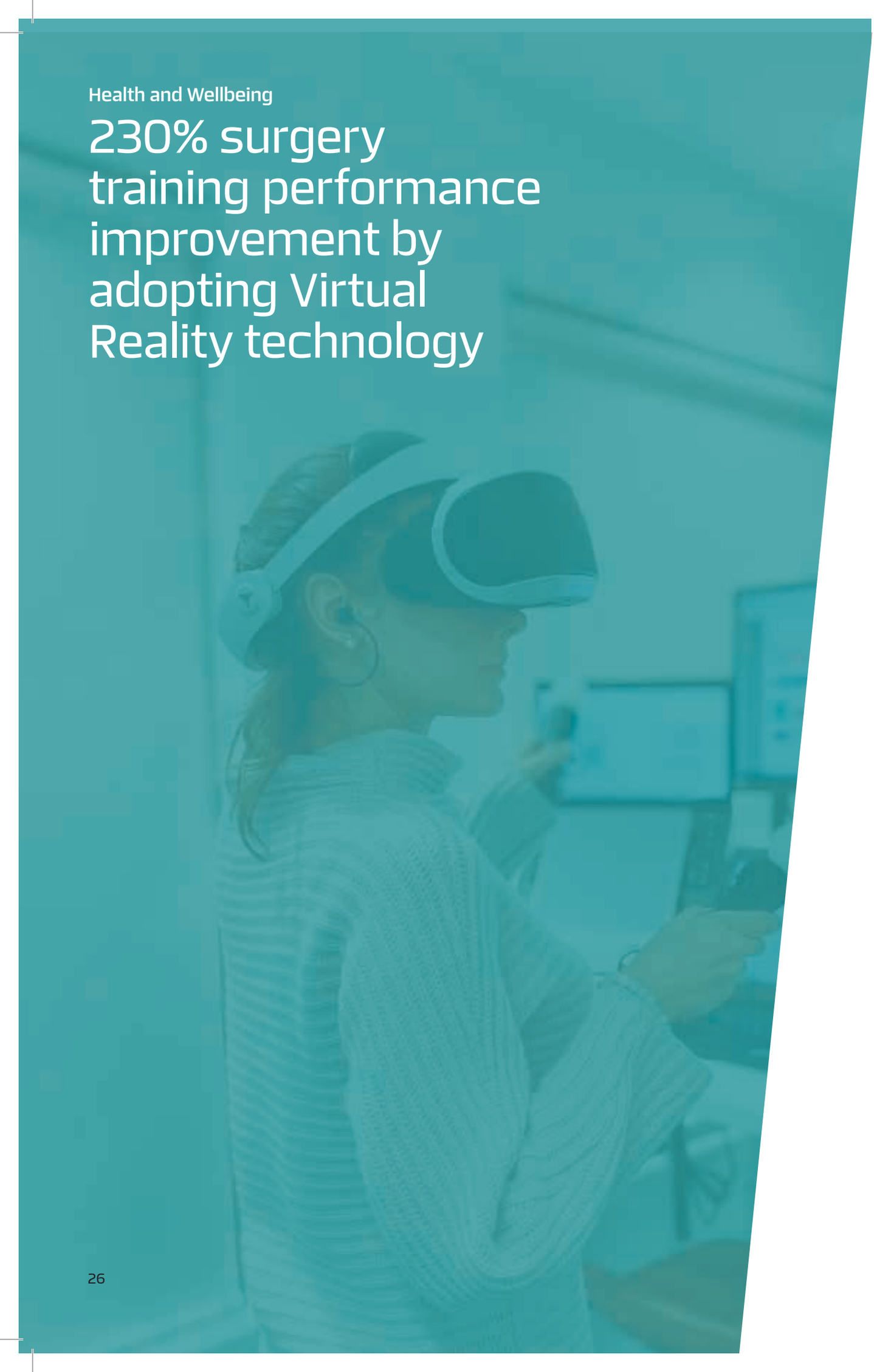
The robot is used by patients at Tan-Tock-Seng Hospital in Singapore and was developed by Articare. It is compact and lightweight (14kg compared to traditional 70+kg equipment). It also modular and can be catered to various applications and patients.

Developed over years of research, H-Man has embedded intelligent algorithms which automatically adapts to the patients' performance levels, allowing safe and independent training anytime, anywhere.

Video - YouTube
Link 1 – The Straits Time

Health and Wellbeing

230% surgery training performance improvement by adopting Virtual Reality technology



Health and Wellbeing

VR Surgeon

Current practices and methods of training and assessing surgeons have lagged behind innovation, leaving some doctors unprepared to perform complex surgeries and putting patients at risk.

Advancements in medical devices and surgical techniques hold promise for saving and improving lives. Using virtual reality technology in training may play an important role in addressing these deficiencies and improving skills.

Description

A recent report from the Association of American Medical Colleges (AAMC) estimates that the United States will face a shortage of between 54,100 and 139,000 physicians by 2033. The challenges of COVID-19 travel restrictions is further accelerating this supply shortage with huge impact on rural areas.

Furthermore, shortfalls in training and assessment are creating increasing levels of risk, with serious consequences for patients and the surgeons that care for them.

Recent studies have found that:

- 30% of surgeons couldn't operate independently after residency

Entity

Various public university teaching hospitals and medical schools (led by OSSO VR)

Region and location

North America – United States of America

Core technology

Virtual Reality

VR Surgeon

- Lower-skilled bariatric surgeons had mortality rates five times higher than their high-skilled counterparts
- An estimated 7 million patients around the world experience surgical complications each year

The Marshall University Joan C. Edwards School of Medicine, has adopted a virtual reality (VR) training & assessment platform, Osso VR, to help streamline surgical education. Since 2018, medical students and residents at Marshall University have used Osso VR to repeatedly practice, learn and track progress in a wide variety of procedures in VR.

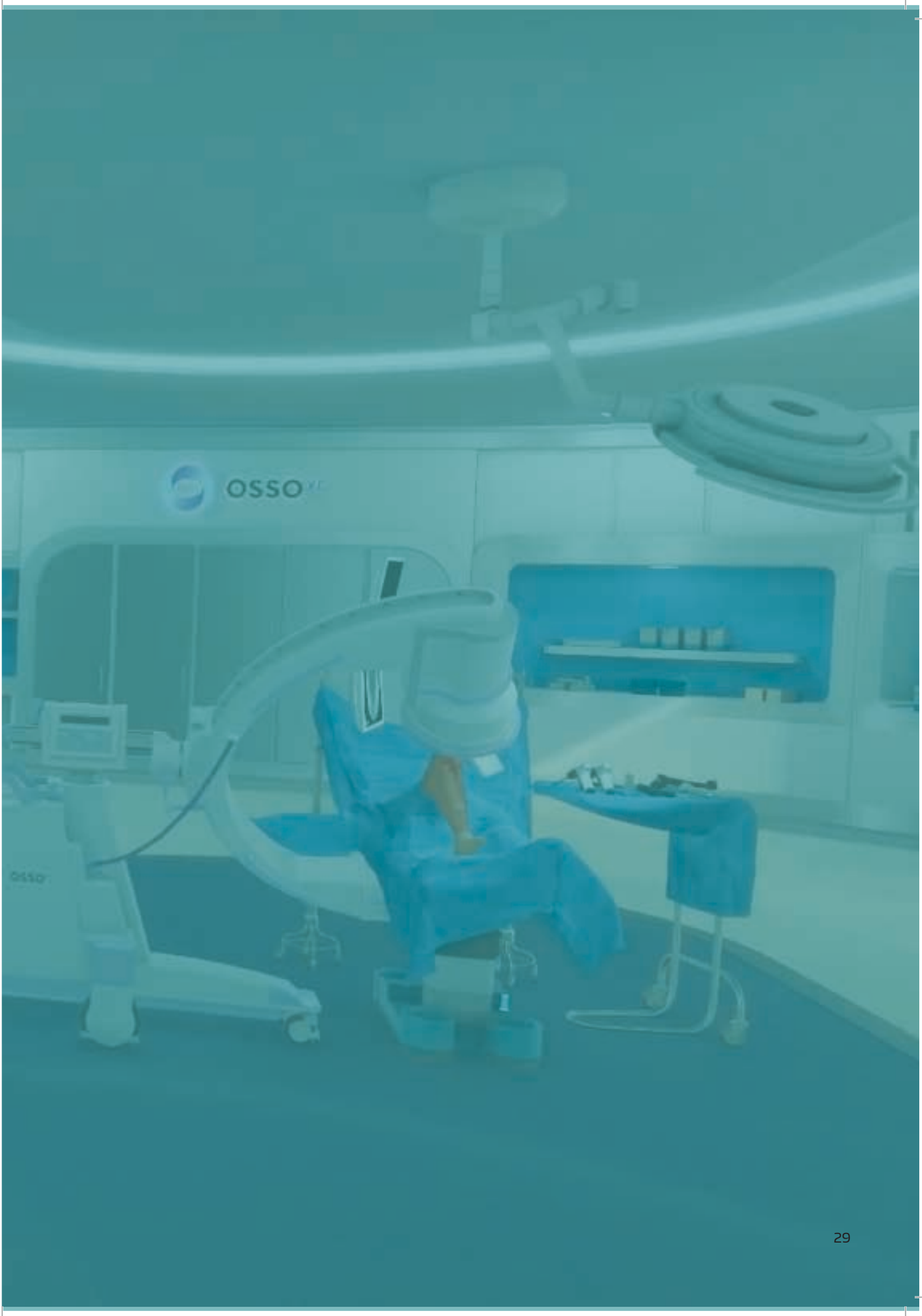
Osso VR's surgical training technology provides on-demand, educational experiences that are effective, repeatable, and measurable. The platform has been included in surgical training programs worldwide and is currently used by 20+ leading teaching hospitals and 14 top medical device companies in 20 countries.

According to a study by UCLA, VR training has significant advantages over traditional training methods. Participants in the VR group scored significantly higher in all categories compared to the traditionally-trained group, with an overall improvement of 230% in the total score.

VR-trained participants completed the procedure an average of 20% faster than the traditionally-trained group and completed 38% more steps correctly in the procedure-specific checklist.

Osso VR's ultimate goal is to make training more effective, efficient and trackable and to streamline the 14-16 years it takes to become a surgeon.

Video - YouTube
Link 1 - Harvard Business Review


OSSO

Health and Wellbeing

Providing citizens with 15% better sleep and reduced anxiety through a personalized digital solution

Health and Wellbeing

Anxiety and Insomnia

Insomnia and anxiety disorders are increasingly common. The growing pace of change (economic, social and political) is manifesting itself in anxiety causing sleep deprivation which in turn worsens anxiety, spurring a vicious cycle of insomnia and anxiety disorders.

Scotland is the first country to implement a fully digital solutions to provide help for anxiety (Daylight app) and insomnia (Sleepio app) at no cost to its citizens. To date, 70% of users gained an average of seven additional hours of sleep per week.

Description

Anxiety is frequently connected to sleeping problems. Excess worry and fear make it harder to fall asleep and stay asleep throughout the night.

Anxiety disorders are the most common mental health problem across the globe, and insufficient sleep is known to have swept negative implications on overall health. As a result, understanding and addressing the links between anxiety and sleep can be fundamental to physical and emotional wellness.

Entity

National Health System

Region and location

Europe – Scotland

Core technology

Mobile apps using Artificial Intelligence

Anxiety and Insomnia

Scotland is the first country in the world to implement fully digital solutions to address its citizens' anxiety and insomnia at no cost to the user. The offering builds on the government's Computerized CBT (cCBT) and Digital Mental Health program, effectively scaling access to digital modules of care.

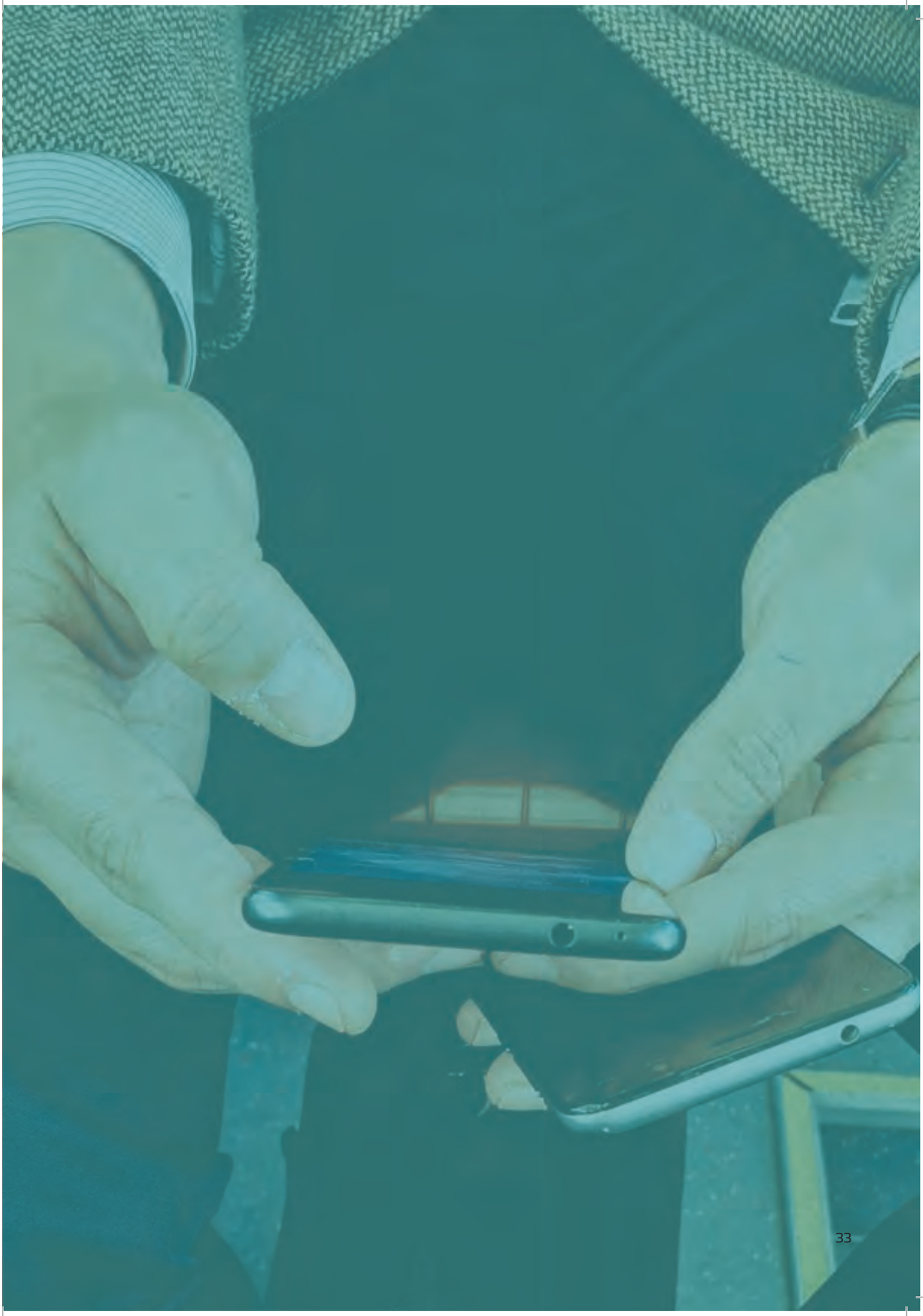
Online Cognitive Behavioral Therapy (otherwise known as CBT) has proven to be very effective in the treatment of many mental health concerns such as depression, anxiety, and stress. It targets destructive behaviors and thought patterns common in individuals experiencing these symptoms.

Daylight is the app design to combat worry and anxiety. It allows citizens to access CBT in their own time and at their own pace, listening and guiding them through learning and practicing proven strategies to reduce stress and anxiety in their life. Daylight uses science backed cognitive behavioral techniques to guide users through practical personalized exercises aiming to reduce their stress and fears- centered around giving users the feeling of control.

Sleepio is a fully automated sleep improvement app based on CBT. Over the course of six sessions, a virtual sleep expert -- The Prof -- will teach users evidence-based cognitive and behavioral skills to tackle even the most stubborn of sleep problems.

Each session is fully automated, yet the content is personalized to the individual's problems based on their answers to the onboarding questions completed prior to starting the program. The program also adapts based on the individual's weekly progress in improving your sleep and the choices you make during the sessions. Although suggestions are made throughout the program, the user is ultimately in control of what techniques to adopt and put to practice. The tool leans towards gamification of your sleep improvement journey.

Link 1 – Digital Health
Link 2 – Fierce Healthcare



Revolutionary blood test to detect more than 50 types of cancer before symptoms appear using advance regression and software analysis

Health and Wellbeing

Galleri Trial

The NHS-Galleri trial, the first of its kind, checks for the earliest signs of cancer in the blood and aims to recruit 140,000 volunteers in eight areas of UK to see how well the test works in the NHS.

The Galleri test can detect multiple types of cancer through a single blood draw by looking for signals of cancer that may be present. If a signal that may be cancer is detected, Galleri can identify the location of the cancer signal in the body, for example, the pancreas or the liver, with high accuracy. This information is intended to help healthcare providers determine the appropriate test(s) to confirm whether cancer is present.

Description

Anxiety is frequently connected to sleeping The NHS-Galleri study is a Randomized Control Trial (RCT) – meaning that half the participants will have their blood sample screened with the Galleri test right away and the other half will have their sample stored and may be tested in the future. This will allow scientists to compare the stage at which cancer is detected between the two groups.

People will only know they're in the test group if they are among the small minority whose test detects potential signals of cancer in their blood. These people will be contacted by the trial nurse by phone and referred to an NHS hospital for further tests.

Entity

National Health System

Region and location

Europe – United Kingdom

Core technology

Advanced DNA test and computer analysis

Galleri Trial

It works by finding chemical changes in fragments of genetic code-cell-free DNA (cfDNA) that leak from tumors into the bloodstream.

The test consists a simple blood exam that research has shown is particularly effective at finding cancers that are typically difficult to identify early – such as head and neck, bowel, lung, pancreatic, and throat cancers.

Initial results of the study are expected by 2023 and, if successful, the NHS in England plans to extend the rollout to a further one million people in 2024 and 2025.

Link 1 – NHS Web Site
Link 2 – Genomics Education Program

First-ever person healed from HIV infection through stem cells transplant

Health and Wellbeing

IMPAACT P1107

A 64-year-old woman with leukemia is the first person ever to be cured of H.I.V. using a new transplant method involving umbilical cord blood. She was part of a study that began in 2015 designed to monitor outcomes of 25 people with HIV in the U.S. who underwent a transplant. Patients in the study first receive treatment to destroy cancerous cells. Doctors then transplant stem cells from individuals with a genetic mutation which makes them resistant to HIV.

The treatment can currently only be adopted for patients with leukemia, and it is the first involving umbilical cord blood.

Description

HIV (Human immunodeficiency virus), a disease that emerged in the 1980s, has already claimed over 36 million lives worldwide.

Until recently, the only medications licensed and approved by the FDA for HIV prevention or pre-exposure prophylaxis, most commonly known as PrEP, were daily pills, which slow the progression of an HIV infection in the body.

This revolutionary approach is using genetically-matched umbilical cord blood with HIV-resistant mutation and opens the door to more diverse populations and studies.

Entity

National Institute of Allergy and Infectious Diseases (NIAID)

Region and location

North America – United States of America

Core technology

Stem cells

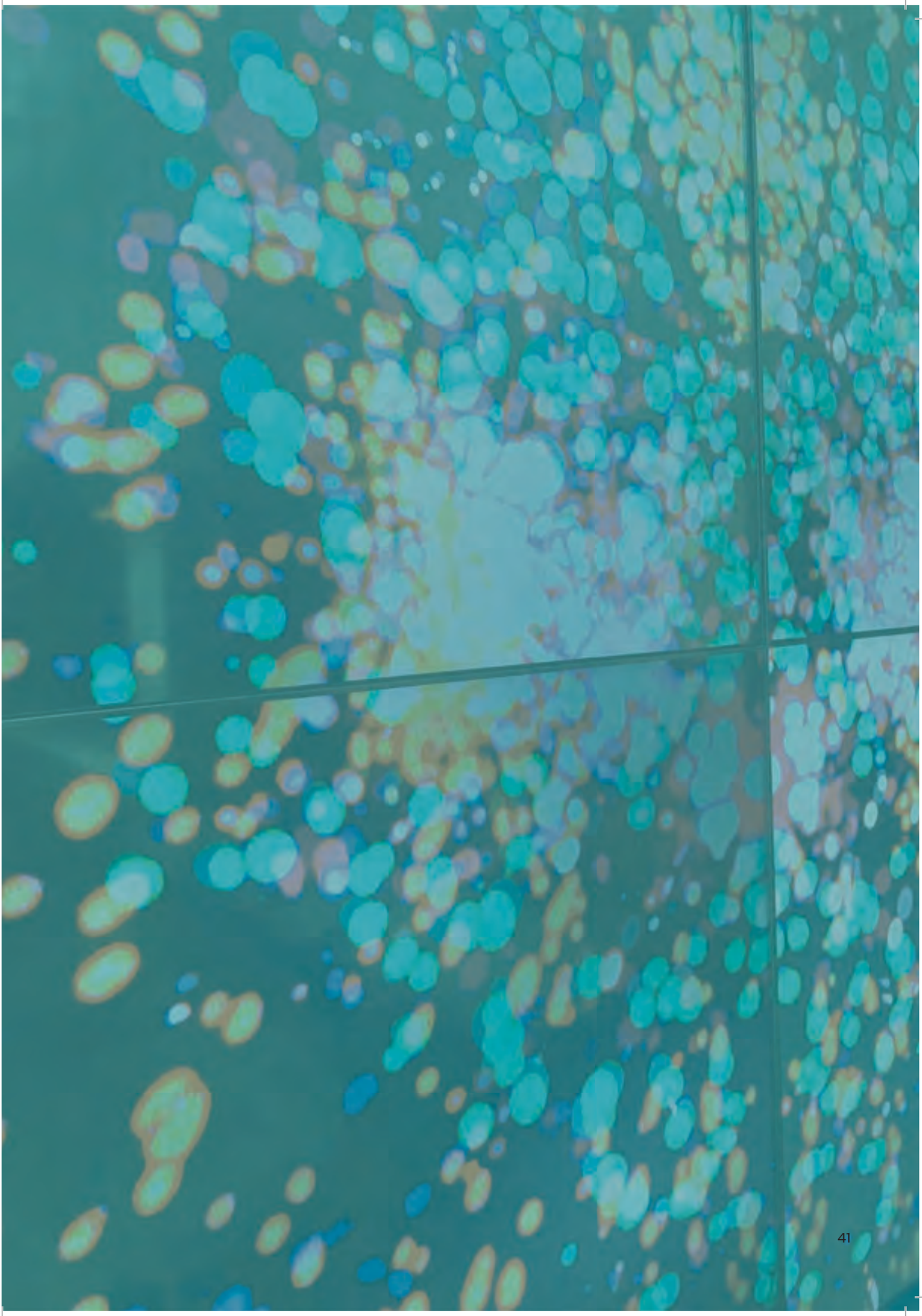
IMPAACT P1107

The results show great promise in facilitating more accessible HIV treatments, especially for those who are already suffering from cancer.

Cord blood is much more widely available than adult stem cells that are used in bone marrow transplants.

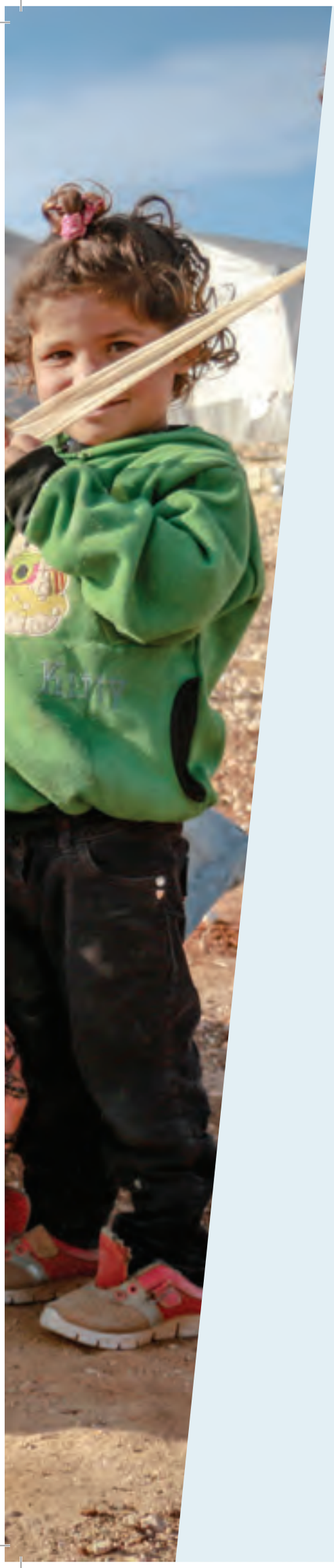
Previously, only two men have been cured of HIV using a bone marrow or stem cell transplant. And while this is the third known case of HIV remission in an individual who received a stem cell transplant of any kind, experts in the field caution that this method is not ideal for curing the many millions of HIV-positive people around the globe today.

Link 1 – NIAID Web Site



Refugees

How fearless Governments improve living conditions and unleash new opportunities



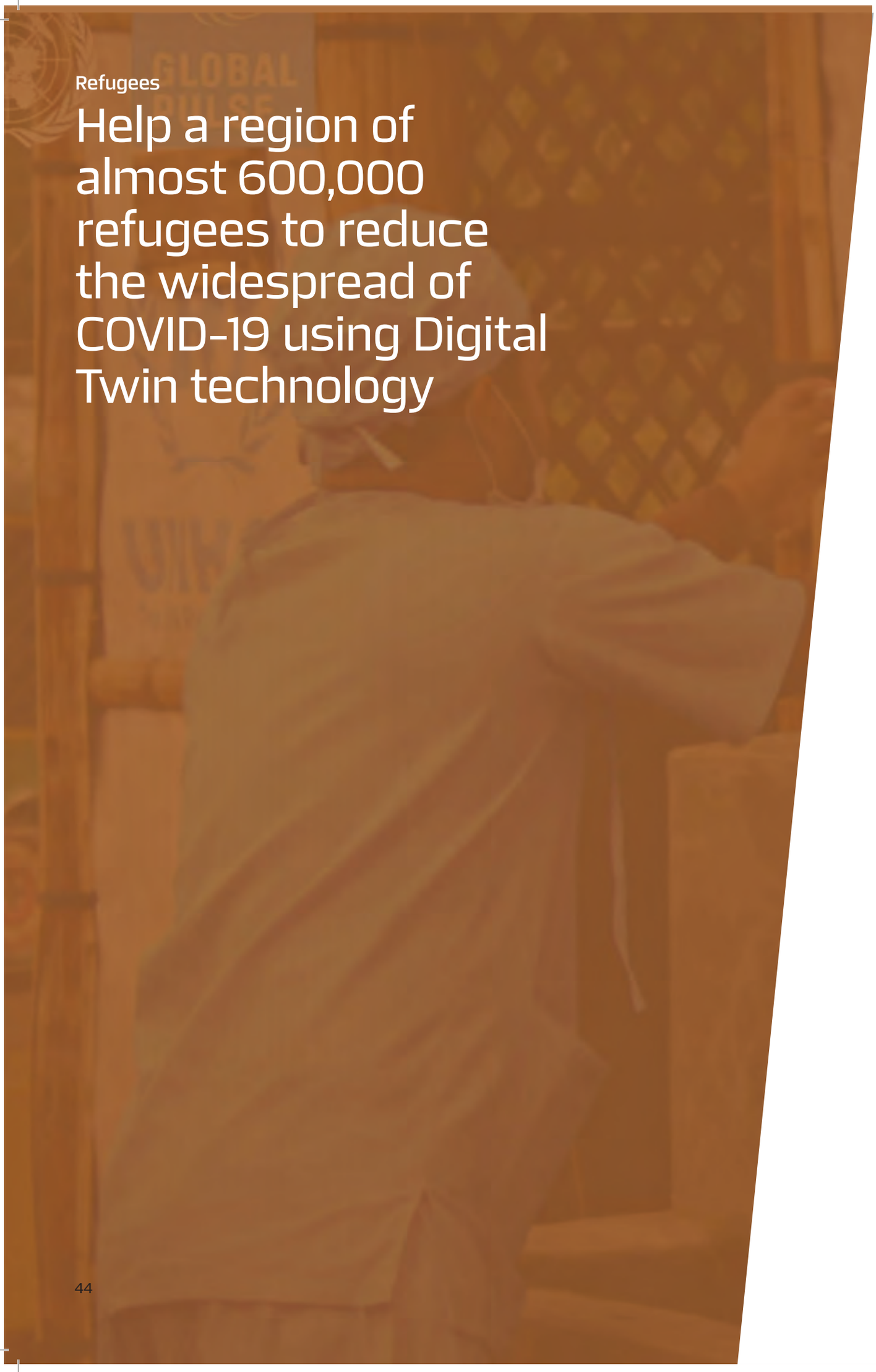
Helping refugees with long-term solutions fueled by innovation

Refugees are facing every day a number of challenges that have significant impact on their condition. From displacement due to wars, to environmental disasters, and lately the new pandemic, all those challenges have created unparalleled strain on individuals, host countries, and the international humanitarian system.

Government entities are embracing Innovation as a transformative element to shape new opportunities and provide impactful and long-term solutions, aimed to re-think and enhance the approach to quality of life and overall condition improvement.

Refugees

Help a region of almost 600,000 refugees to reduce the widespread of COVID-19 using Digital Twin technology



Refugees

Epidemic simulation modelling

The Cox's Bazar settlement in Bangladesh, the largest of its kind in the world, houses more than 44,000 people per square kilometer. This is one and a half times higher than the density of people in New York City. To help inform epidemic response, public health officials, researchers, and scientists used mathematical modelling to test out how different public health interventions may affect the spread of the COVID-19 disease. To do this, they used data to create a 'digital twin' of the settlement that reflects its geography and physical layout, as well as the density, age, sex, and family compositions of the people who live in it.

Entity

UNHCR and UN Global Pulse

Region and location

Asia - Bangladesh

Core technology

Digital Twin platform, AI technology

Description

The spread of COVID-19 has presented many challenges to healthcare systems worldwide. In settlements for refugees and internally displaced persons which often suffer from overcrowding, insufficient sanitation and particularly rapid disease spread, the pandemic presents a significant threat, as well any future health crisis. In a concerned effort, health professionals, data scientists and researchers across the UN and academia join forces to apply epidemic modeling in the fight against COVID-19.

Refugees

Epidemic simulation modelling

Together they created an agent-based model to simulate the spread of the virus in the Cox's Bazar settlement in Bangladesh for a variety of different scenarios.

Imagine creating a virtual world that mimics the way people moves and what they do throughout the day to understand how a virus can spread.

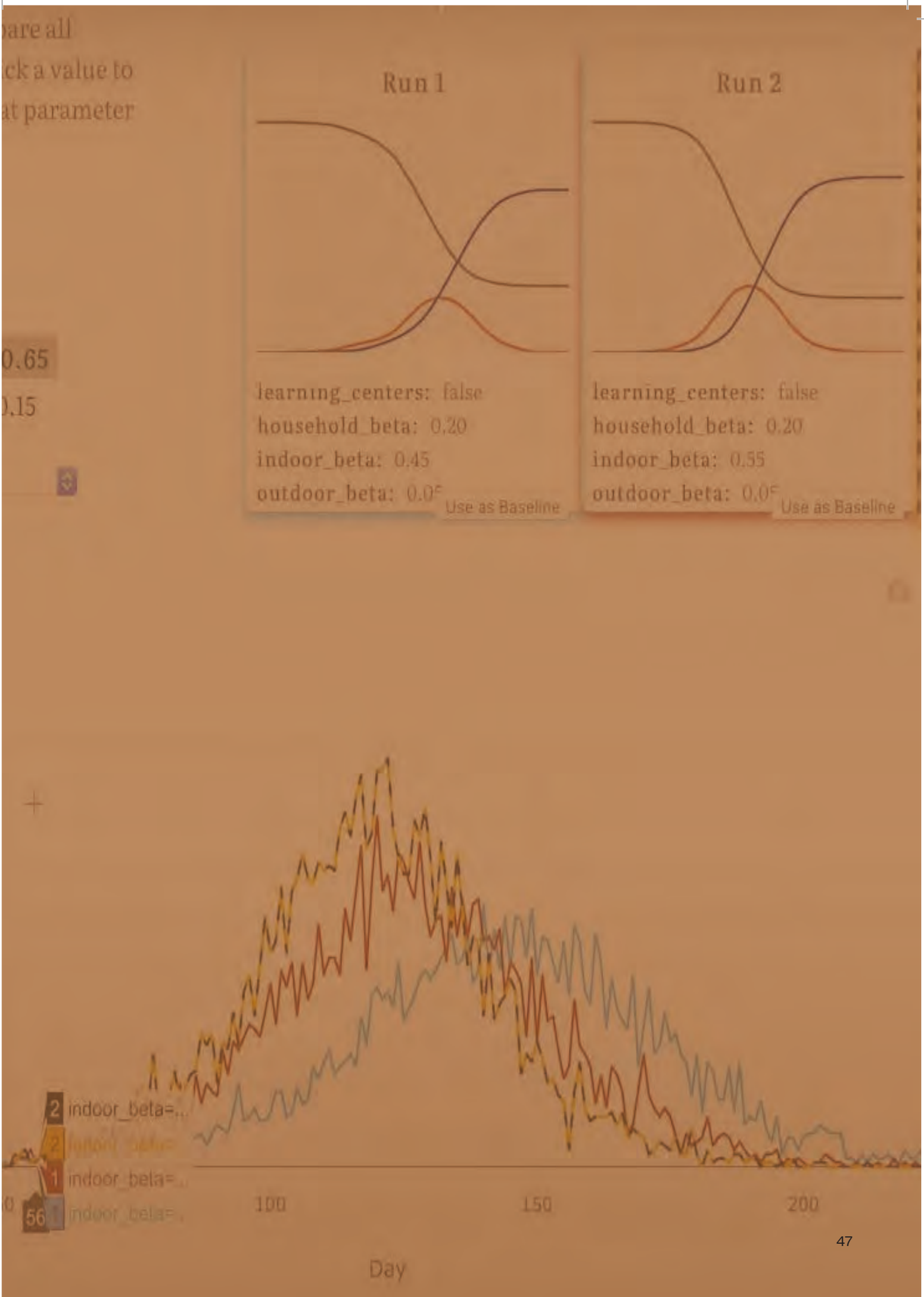
The team design a three-step process:

1. create a digital twin of the settlement including the locations where people might interact like gathering spots, water pumps and food distribution centers
2. simulate the movement of individuals, their daily routine and how they interact
3. model the effect of different public health interventions against COVID-19.

For example, how effective is mask wearing in particular locations of the Cox's bazar settlement. In nearly every scenario modeled, wearing a mask reduces the spread of the disease and the result allow policy makers to understand the trade-offs between investing in more effective masks and encouraging more people to wear masks. In combining innovation, technology and multidisciplinary expertise we can better determine the most effective public health intervention and mitigation measures against this pandemic as well as the best ways to respond to future health and humanitarian emergency.

The research has provided crucial insights to World Health Organization and UNHCR public health professionals operating in the refugee settlement to control the spread of COVID-19.

Link 1 – UNHCR Innovation Service
Link 2 – UN Global Pulse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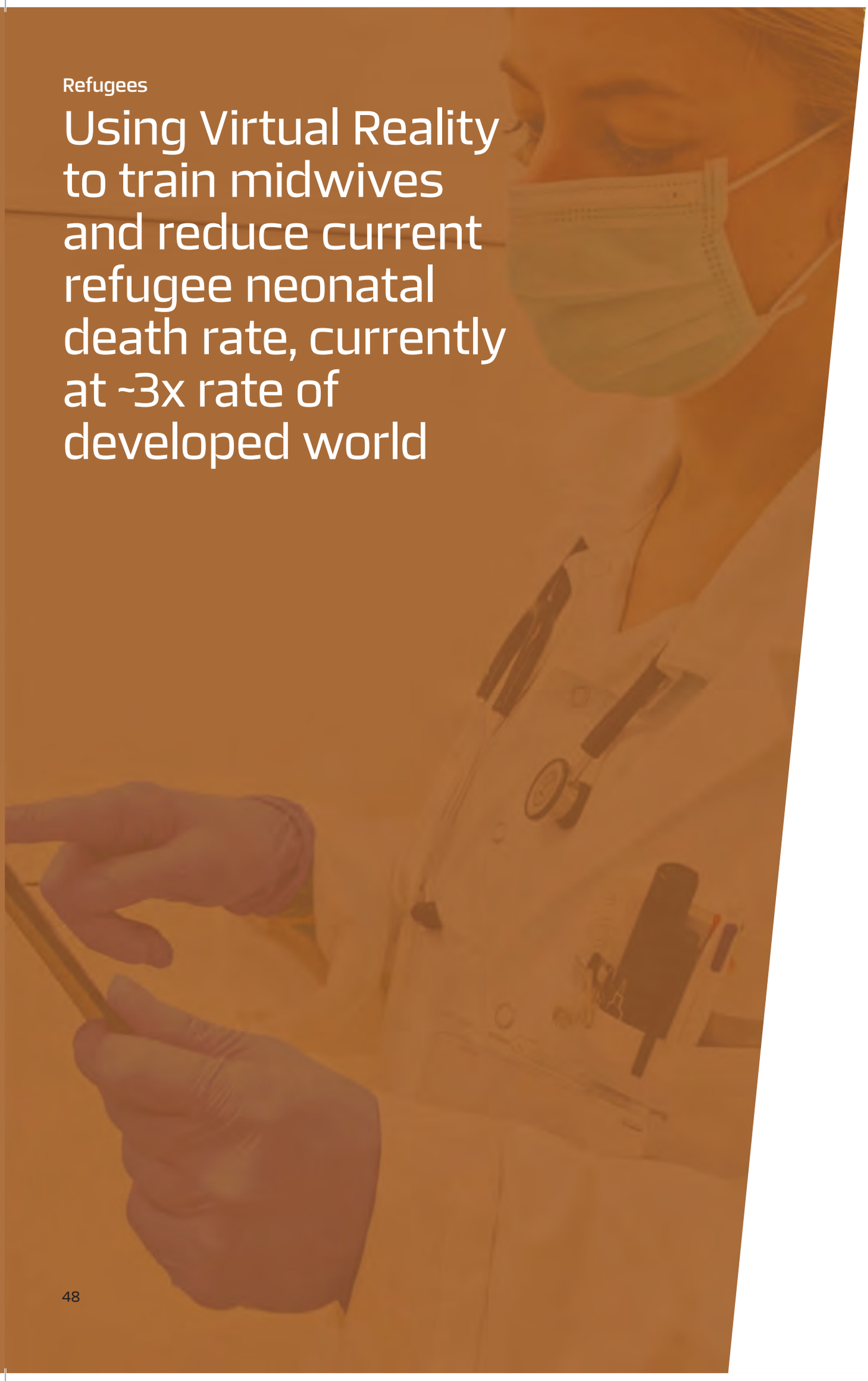
ck a value to
at parameter
0.65
0.15
Run 1
learning_centers: false
household_beta: 0.20
indoor_beta: 0.45
outdoor_beta: 0.0
Use as Baseline
Run 2
learning_centers: false
household_beta: 0.20
indoor_beta: 0.55
outdoor_beta: 0.0
Use as Baseline
2 indoor_beta=...
1 indoor_beta=...
56 indoor_beta=...
100
150
200
Day

Refugees

Using Virtual Reality to train midwives and reduce current refugee neonatal death rate, currently at ~3x rate of developed world



Refugees

Midwifes and AR

The three UNHCR camps in Dadaab, eastern Kenya, currently host more than 400,000 refugees, including many expectant mothers. Within a context of increasing global displacement, the experience of birthing across borders has become a reality for thousands of women in refugee camps. Many of these women choose to receive maternal care from midwives who understand and follow traditional birthing practices.

To meet these women's needs, midwives are creating new digital training toolkits using Virtual Reality and smartphones to expand vital maternal care in the Dadaab refugee camps.

Description

Many female refugees travel for long periods of time before reaching a settlement camp. A good percentage of them are pregnant and have to endure weeks, and in most cases, months of awful living and traveling conditions. Giving birth after months of high stress is extremely risky for both the mother and child – and, in many cases, refugee camps are not equipped with the technology and know-how to provide sufficient care during delivery.

Entity

Department for Business, Energy and Industrial Strategy

Region and location

Europe – United Kingdom
Solution deployed in Kenya

Core technology

Augmented Reality

Refugees

Midwifes and AR

Academics at Newcastle University and Kenyatta University, Kenya, are collaborating with the women to develop new ways of training future midwives, who are in short supply.

To respond to this problem, the researchers are partnering with Black Rhino, a Virtual Reality (VR) production company based in Nairobi, to develop a set of digital training tools that can be rolled out across Dadaab's refugee camps to support women before, during and after giving birth. The project works with refugee midwives to develop a multi-faceted training program. During workshops held in 'Camp Campus' – a university campus at Dadaab – midwives learn how to use VR and design their own immersive VR stories.

The goal of the project is two-fold: in addition to teaching other refugees to become midwives, the training is also designed to build awareness among doctors in the camp, as well as staff from NGOs, to have a greater understanding of the importance of the traditional practices and cultural sensitivities that exist among the refugee communities who live in the camps.

The refugee midwives are coming up with such creative, engaging and emotionally powerful ways to use VR - not only to educate future midwives but also medical practitioners about the specific cultural challenges of providing maternal care in camp geographies.

This program will contribute to reduce the neonatal death rate that is currently much higher in comparison to the developed countries.

Link 1 – UK Research and Innovation
Link 2 – Newcastle University

Refugees

Eliminating health outbreaks in refugees' camps through on-line / off-line patients tracking using IoT in Cloud

Refugees

E-Health

Most deaths during conflict and displacement are due to indirect causes, specifically infectious diseases. Although the control of communicable diseases and epidemics is one of the top priorities during humanitarian crises, in most cases they are treated once they have already become a problem.

The e-health program in Kenya provides a solution that makes it easy to report, monitor, assess and act upon health-related problems. It is now possible to not only treat an outbreak, but most importantly to prevent one from happening.

Description

By the end of 2017, 68.5 million people were forced to flee their homes as a result of persecution, conflict or generalized violence. Of these, 40 million remained within their national borders and are internally displaced persons (IDPs), 25.4 million crossed borders and are refugees and another 3.1 million are asylum seekers.

Conflict and displacement are a recognized public health risk by concomitantly increasing population vulnerability and reducing the system's response capacity.

Entity

Kenya Red Cross

Region and location

Africa – Kenya

Core technology

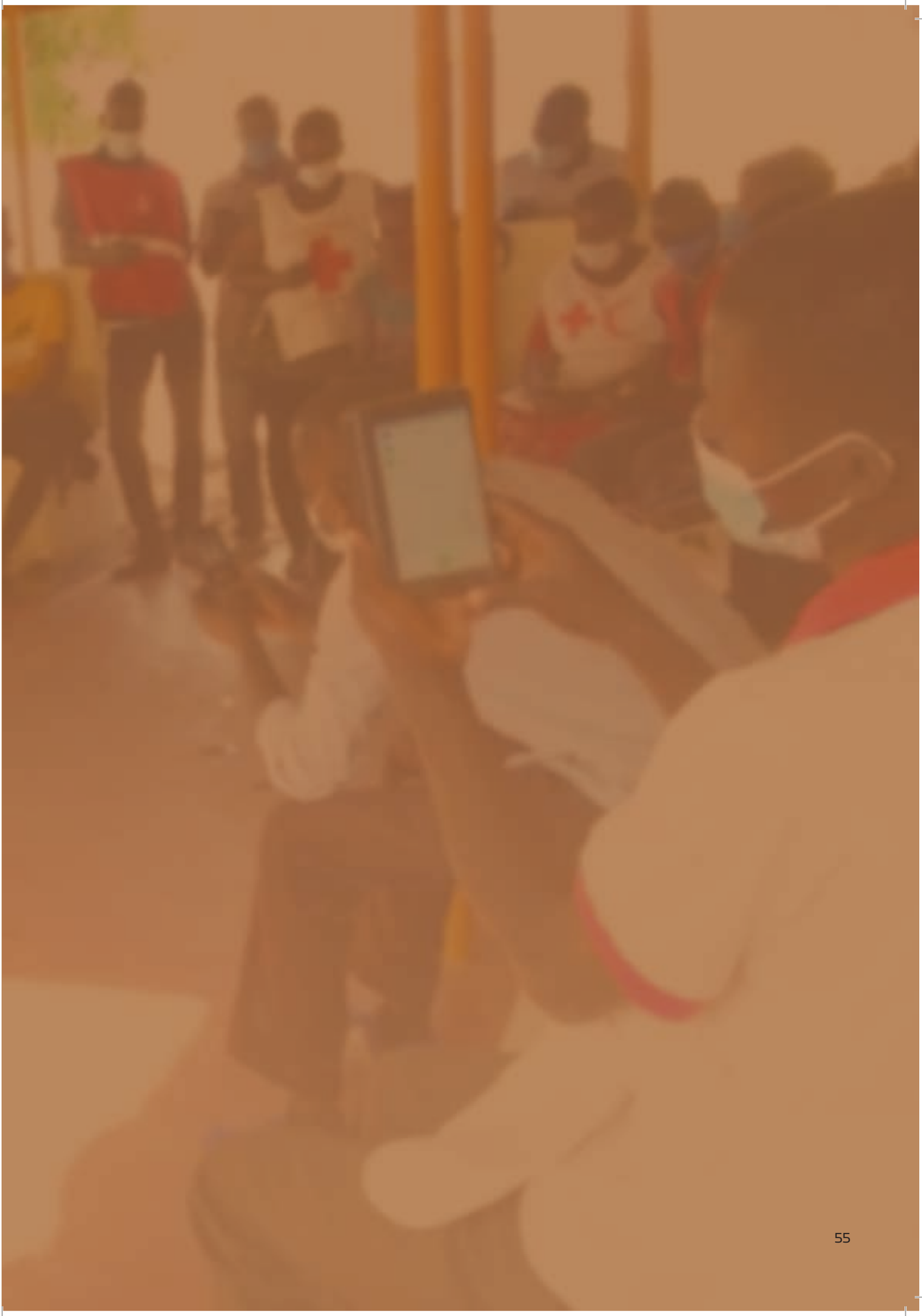
Mobile application supported by IoT and Cloud

E-Health

The majority of deaths in conflict and displacement are due to indirect causes, specifically infectious diseases. Therefore, control of communicable diseases and epidemics has been identified as one of the top ten priorities during the emergency phase of humanitarian crises since the 90s.

Factors such as overcrowding, poor water and sanitation conditions, lack of vaccination, delayed diagnosis and reduced access to treatment can lead to increased occurrence, severity and case fatality of infectious diseases.
E-Health is a project to improve the efficiency in clinical conditions management in refugee camps in Kenya with an e-health solution that makes it easy to report, monitor, assess and act upon health-related problems.
It enables refugees to communicate with health service providers via application which includes an alert feature for refugees under prescription, and those with scheduled visits and geolocation to help health workers find patients and identify areas of outbreaks quickly. It stores messages offline in the absence of connectivity and automatic transmission when the network resumes.
It provides essential connectivity with cloud databases and applications. UNHCR managers integrate the data into a dashboard that provides new levels of visibility into operations of the program.

Link 1 – Faceless Hackers
Link 2 – Tech Refugees



Refugees

Creating a secure ‘identity vault’ helping provide 3 million refugees access to healthcare, education, and banking

Refugees

TYKN

Identity is a problem for every single one of us. In the digital age our data can be breached, hacked or even leaked online. For refugees, identity is all they have left- protecting it is paramount to them.

Tykn offers an innovative solution to this problem by using the advantages of blockchain to create “identities” that store personal data in a private and secure manner creating a future of opportunities through digital identity.

Description

Refugees flee from their countries in serious and dangerous war environments. During the ordeal, many important documents that are not digitally stored and still in paper format, are destroyed due to acts of war together with the institutions that confirm and provide them. About 1.2 billion people in the world lack valid identity documentation, whether online or physical and because of that, are unable to access services such as healthcare, education, banking or find a job. They are forced to live on the fringes of society, at risk of exploitation and trafficking.

Entity

Ministry of Foreign Affairs

Region and location

Middle East – Turkey

Core technology

Web platform and mobile app supported by blockchain technology

Refugees

TYKN

Tykn offers a solution to this problem.

Tykn is a blockchain startup offering refugees an identity solution to facilitate their access to services. Tykn leverages the innovative Self-Sovereign Identity technology that makes digital documents become tamper-proof and verifiable anywhere, at any time.

What is a Self-Sovereign Identity (SSI)? SSI is an identity you own. It's yours. Only the user holds it on your own personal digital identity wallet, and only the user decides who gets to "see" it and what of it they get to "see".

The advantages of this technology are many:

1. A secure and digital peer-to-peer channel is established between ID Issuer, ID Owner and ID Verifier. When credentials are exchanged not even the Self-Sovereign Identity system provider knows what is being exchanged. Credential issuing becomes simpler and faster.
2. SSI Credentials are tamper-proof through the use of cryptography.
3. They are private and under your control. SSI uses Selective Identity disclosure technology.

The Turkish Ministry of Foreign Affairs is piloting Tykn's digital identity platform to optimize and speed up the process of issuing Work Permit documentation for 3 million refugees in the country, aiming to increase their opportunity to become financially independent.

Link 1 – TYKN Tech
Link 2 – Silicon Canals

Refugees

Secure potabile drinking water to 2 million refugees in Uganda and Ethiopia through interconnected IoT solutions

Refugees

Clean Water

Access to water has been a huge challenge for refugees. More than half of refugee camps cannot secure the minimum daily water requirement of 20 liters/person. The challenge of water security is not just the immediate needs during periods of influx, but long-term sustainability of water supplies for populations that may spend 20 years as refugee.

French eco-startup GreenCityzen on behalf of the UN Refugee Agency (UNHCR)'s WASH department (Water Sanitation and Hygiene) is using interconnected IoT solutions to secure water supplies of 15 camps hosting nearly 2 million refugees in Uganda and Ethiopia.

Description

Located on land allotted by host-country governments, refugee camps are often very remote. Consequently, refugees experience little state support and lack access to existing infrastructure and water services. The responsibility to provide water to populations living in these camps therefore usually lies with international humanitarian organizations, such as the UN Refugee Agency UNHCR and their implementing partners. For many international agencies and governments however, refugees are seen as temporary populations and are consequently provided limited emergency and short-term assistance.

Entity

WASH UNHCR in collaboration with Uganda and Ethiopia's Government

Region and location

Solution deployed in Uganda and Ethiopia

Core technology

Interconnected platforms using IoT, sensors and Cloud

Refugees

Clean Water

At the onset of a humanitarian crisis or conflict, funding may be drawn-in through international political and media attention, but this later subsides – leaving emergency water deliveries, or boreholes, unmaintainable.
Around 45% of the world's refugees now live in 'protracted crisis' which is when refugee populations of 25,000 people or more live in exile for five years or longer. The average time someone will spend as a refugee is nearing 20 years. For these people more sustainable access to water is urgently needed.

GreenCityzen developed an IoT and Artificial Intelligence (AI) end-to-end solution to serve the refugees with drinkable water whilst also supporting the environment.

LoRaWAN-enabled sensors installed at reservoirs enable managers to monitor water levels in real time, providing unprecedented visibility into usage and resource management.
Data from the sensors designed by several companies travels through an outdoor Kerlink Wirnet™ Station LoRaWAN gateway, which provides essential connectivity with cloud databases and applications. UNHCR managers integrate the data into a dashboard that provides new levels of visibility into operations of the program.

Link 1 – Tech Journal
Link 2 – The Things Network

Water truck
Deliveries counting

Water stock
monitoring

Pumping systems
Supervision

Refugees

Boosting refugee employment up to 70% through ‘smart’ matching with resettlement sites

Refugees

GEOMATCH

For refugees, the road to integration is often rocky. Their ability to acclimate or achieve economic success in a new country isn't part of the selection criteria for admission; refugees selected by UNHCR for resettlement are those who can provide evidence of severe persecution and suffering. Refugees find it challenging acquiring a new language and finding basic employment to be insurmountable.

But now, powered by artificial intelligence (AI) and machine learning (ML), GeoMatch' solution by matching refugees' characteristics to resettlement sites, leads to improved employment rates.

Description

Imagine two refugees that grew up in the same town, attended the same school together, and went into similar trades. After war broke out, they were forced out of their homes, spent several years in a refugee camp, after which they were resettled in two completely different cities. Then their paths diverge – one lands a job closer to his skills with members of his crew helping him to learn the local language and rebuild his life, the other ends up in a city completely hostile to him, struggling to integrate in a job with no clear sign of advancement opportunities and socially isolated which ultimately provides doubts on his future.

Entity

Swiss State Secretariat for Migration

Region and location

Europe – Switzerland

Core technology

Platform powered by Artificial Intelligence, Machine Learning

Refugees

GEOMATCH

What can be done so that refugees' lives after resettlement are successful? GeoMatch and Jens Hainmueller provide a first solution to these problems.
AI-enabled decision-making tools can transform the way we approach refugee resettlement questions, allowing us to combine insights from big data with the expertise of service providers and governments. IPL developed a first-of-its kind algorithm to match asylum seekers and refugees to host communities where they are most likely to succeed.

The algorithm uses historical data on refugees and their experiences to learn about the ways in which refugees' personal characteristics interact with the geographic context in which they resettle to affect integration outcomes. Outcomes include information such as how soon they were able to find employment, what types of jobs they found, and whether or not they moved to a new location after their initial resettlement.

Here's how it works:

1. Historical data about past refugees and their integration outcomes is used as an input into the algorithm
2. The algorithm develops models to predict integration outcomes based on trends and patterns in the historical data
3. The algorithm receives new data on the personal characteristics of incoming refugees
4. The algorithm predicts how well these newcomers will do in various locations
5. These predictions are used to generate location recommendations for placement officers

After testing the algorithm on historical data, IPL researchers demonstrated that algorithmic matching could boost employment rates by 40-70 percent among refugees in the United States and asylum seekers in Switzerland.

Link 1 - Immigration Lab
Link 2 – Migration Data Portal

Refugees

Innovating the training and rehabilitation of refugee offenders with drug problems through virtual reality technology

Refugees

TRAIVR

The TRAIVR project aims to provide rehabilitation through a training program based on virtual reality (VR) aimed at refugee probationers with drug addiction problems. This virtual reality program has the objective to improve their coping skills, namely problem-solving and emotional regulation skills.

Virtual reality offers a better learning opportunity for adults while respecting confidentiality; moreover, it overcomes the language barrier cost-effectively since the same VR scenario can be adapted to different languages.

Entity

Ministry of Justice

Region and location

Middle East - Turkey

Core technology

Virtual Reality

Description

Turkey has one of the world's largest migration-related detention systems, operating more than two dozen of removal centers with a capacity of nearly 16,000 in addition to ad-hoc detention sites along its borders, airport transit zones, and police stations.

The Ministry of Justice kicked-off the TRAIVR program with the following objectives:

— Promote VR technology in teaching coping skills and adapt the training program to probation settings as a new methodology

Refugees

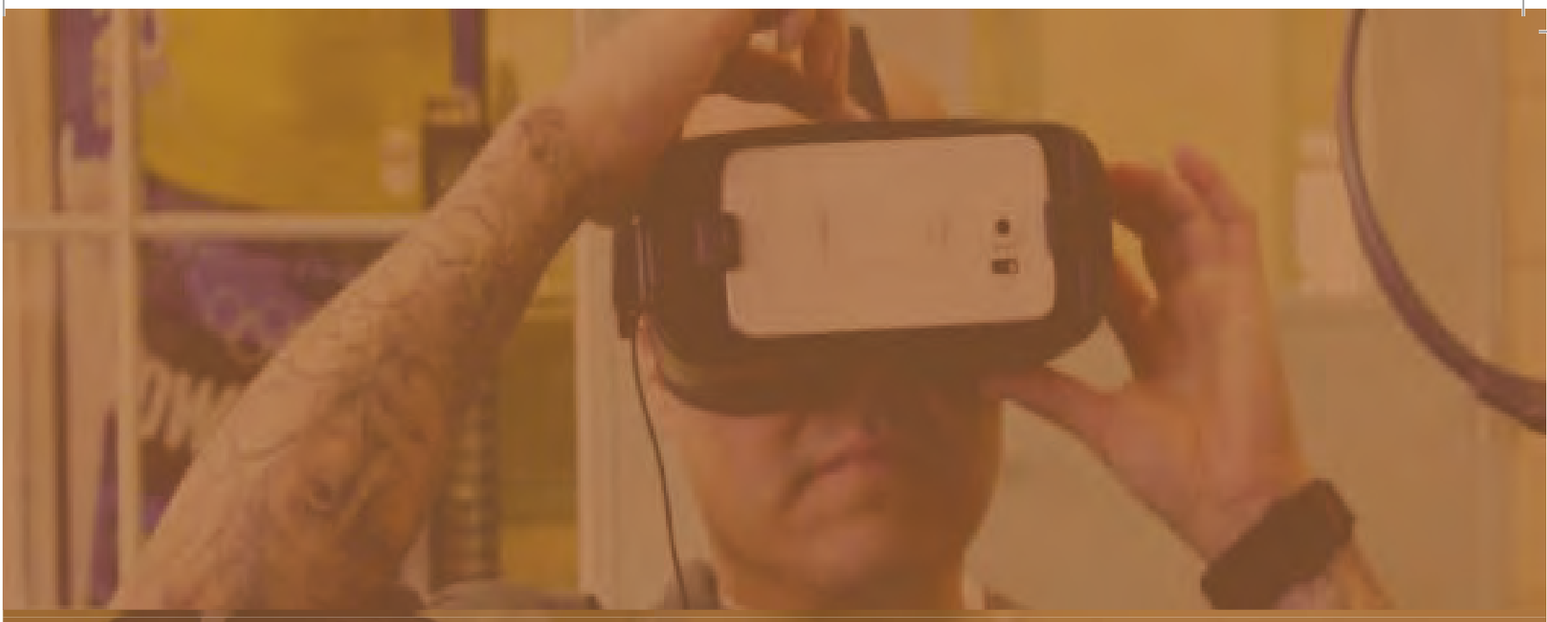
TRAIVR

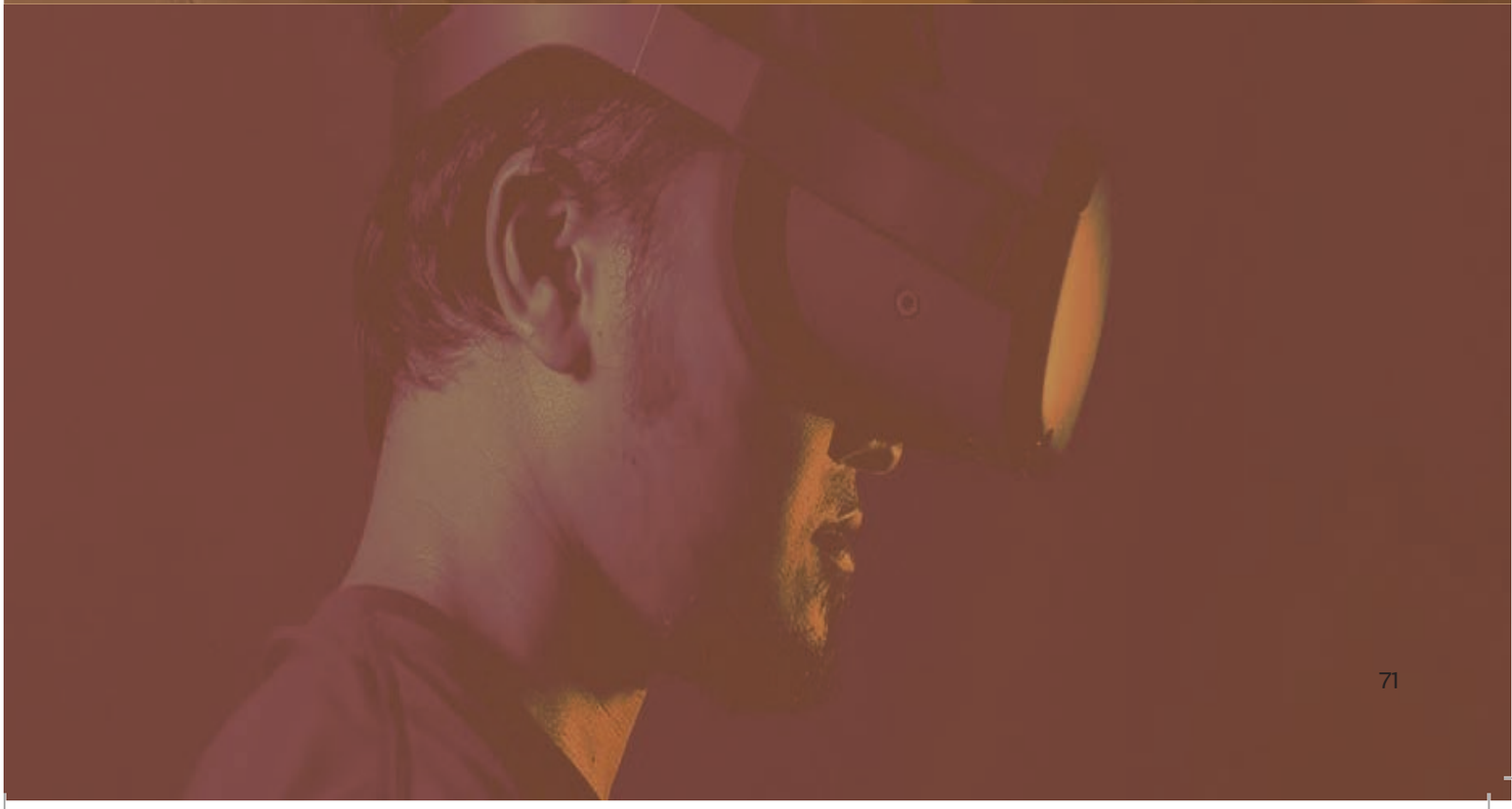
— Bridge the language barrier that could be preventing better results in training and rehabilitating refugees under probation measures.

The expected outcomes are the following:

— Research and report on needs and issues arising from language barriers in the refugee rehabilitation system;
— Definition of the best implementation structure and methodology using virtual reality technology for drug users in rehabilitation;
— Development of a comprehensive set of use cases to better develop future interventions
— A virtual reality training program in life skills, such as stress management, coping techniques and emotional regulation;
— Creation of a methodology for the use of VR technology in probation environments in the case of rehabilitation of refugee offenders suffering from substance abuse problems;
— Structuring of a training program for trainers aimed at probation officers responsible for the rehabilitation of refugees under probation measures;
— Assessment of the change in skills targeted by the virtual reality training program

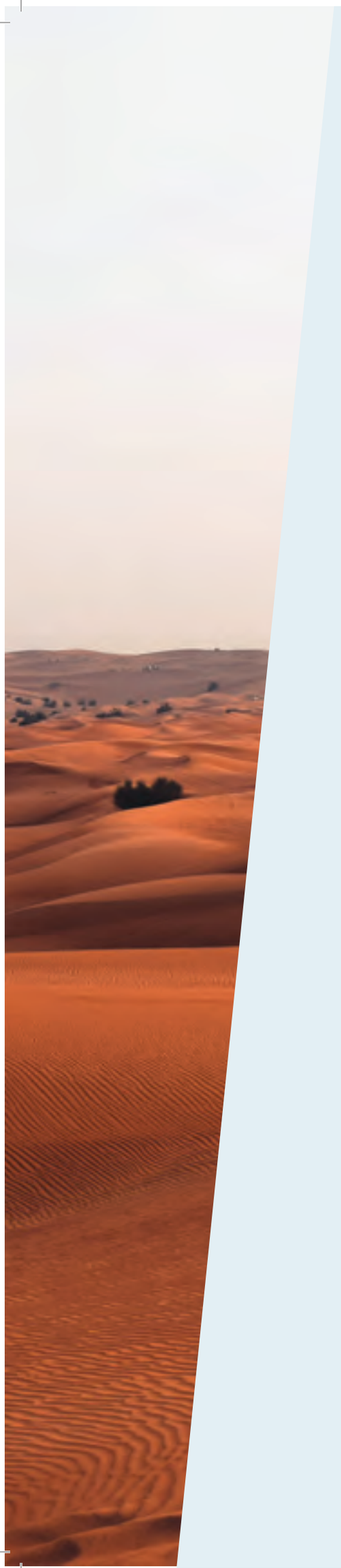
Link 1 – Prison Systems





Climate Change

How fearless Governments secure environmental protection and human future



Leveraging digital revolution to support the environment

Climate change has the potential to destroy ecosystems, endangering biodiversity with a massive impact on food and water security and the future of life on our planet.

Today, many government entities are exploring ways to induce positive change through bold moves, attempting to play a leading role in securing the humanity's future in the 21st century and beyond.

Climate Change

Unleashing the power of Smart Drones to plant up to 20k trees per day in remote areas of the globe

Climate Change

Flash Forest

Deforestation is one of our times main challenges. Every year the planet loses 13Bn trees, and less than half get replaced. It's a downward spiral; heat caused by carbon in the atmosphere leads to trees burning which leads to more carbon in the atmosphere.

While many attempts for reforestation have been made over the years, Ontario's Flash Forest (FF) and Emissions Reduction Alberta (ERA), have combined forces to develop a bold technology-based solution. Putting new technology to the test, ERA and FF are deploying drones to nourish life, with the ambition to plant 1 billion trees in Canada by 2028.

Entity

Emissions Reduction Alberta – in partnership with the Canadian Government

Region and location

North America – Canada

Core technology

Drone, Automation, AI

Description

Drones don't address deforestation, which is arguably an even more critical issue than planting trees, since older trees can store much more carbon. But to restore forests that have already been lost, drones can work quicker and cheaper than humans with shovels. Flash Forest's technology can currently plant 10,000 to 20,000 seed pods a day; as the technology advances, a pair of pilots will be able to plant 100,000 trees in a day - by hand, someone might be able to plant at most around 1,500 trees in a day.

Climate Change

Flash Forest

The company aims to bring the cost down to 50 cents per tree, or around a fourth of the cost of some other tree reforestation efforts.

When the company is tasked with replenishing an area, it first sends out a mapping drone to get the lay of the land and create a flight path that avoids areas where seeds won't grow (roads, bodies of water, etc.).

Cross-pollination is also evaluated – making sure the trees planted do not have a detrimental effect on the other surrounding species and the existing environment. Once the drone lands, that information can be shared with the rest of the fleet involved in the job.

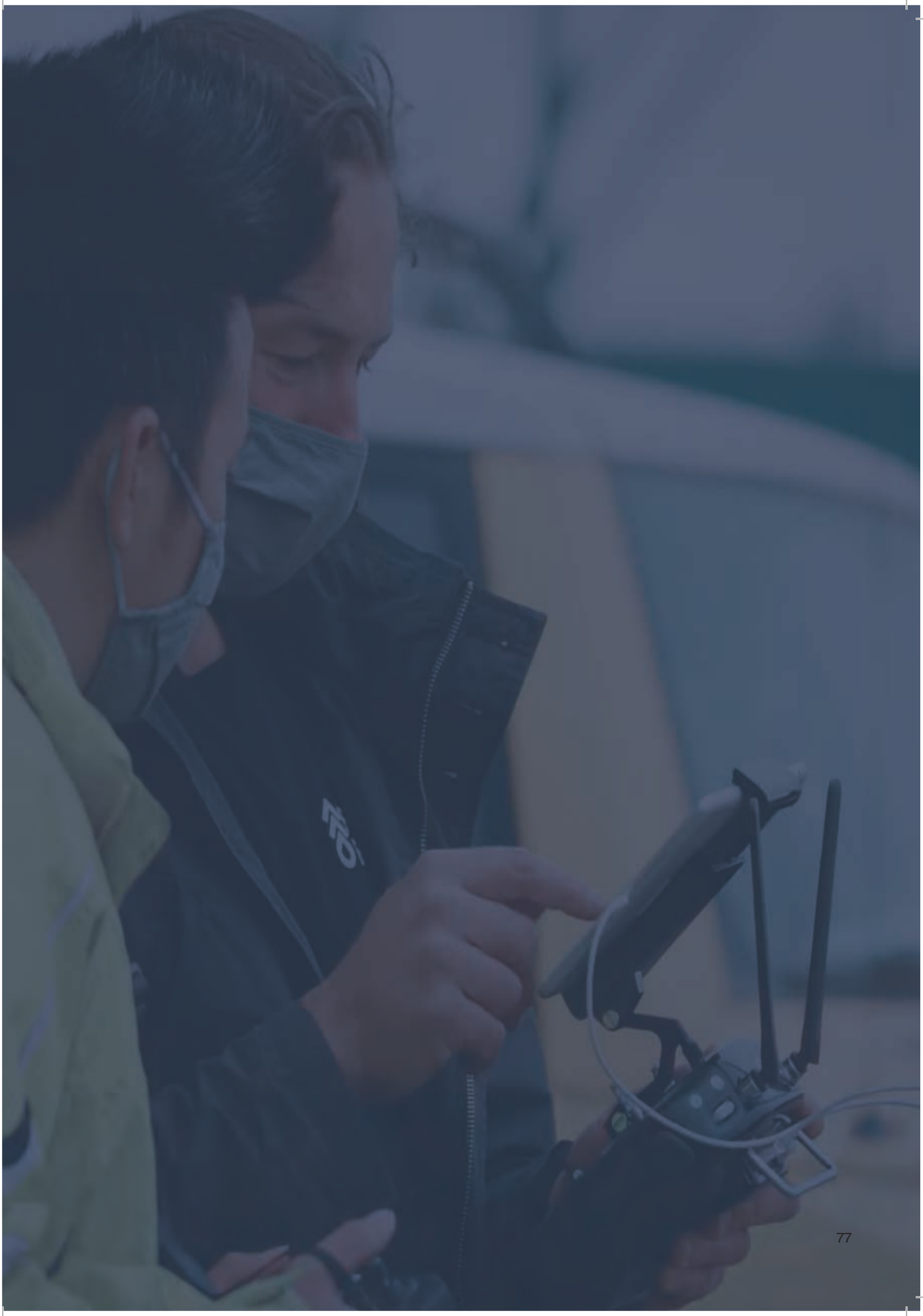
Next, a swarm of drones begins precisely dropping seed pods, packed in a proprietary mix that the company says encourages the seeds to germinate weeks before they otherwise would have. The seed pods are also designed to store moisture, so the seedlings can survive even with months of drought. In some areas, such as hilly terrain or in mangrove forests, the drones use a pneumatic firing device that shoots seed pods deeper into the soil.

They can fly as low as three meters above the ground in a cleared area and up to 20 meters above if going atop the canopy, and either drop pods or fire them into the ground at about 180 feet per second.

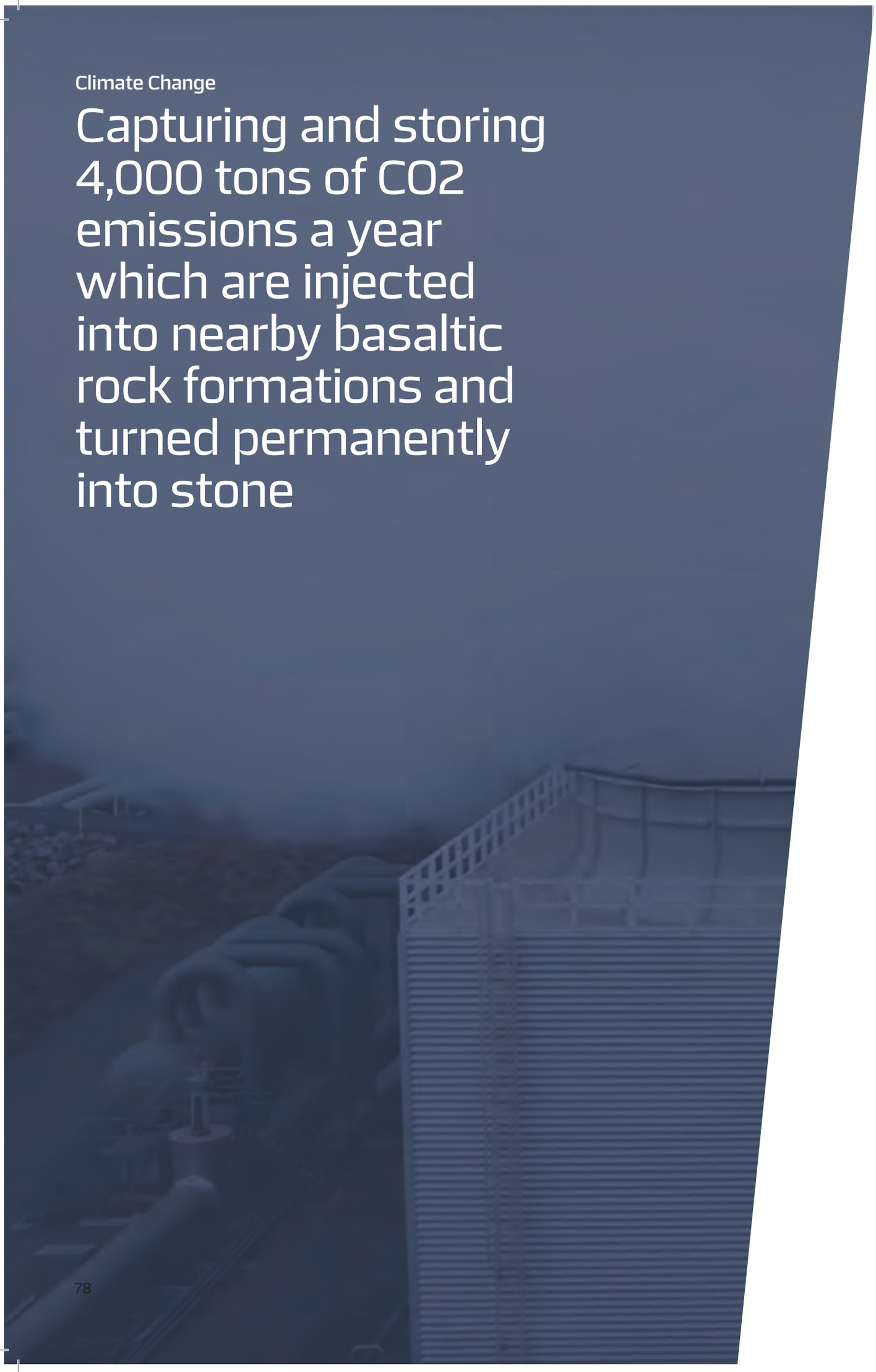
One of the main advantages is that drones can get into trickier areas compared to human planters.

Flash Forest, together with the support from Emissions Reduction Alberta aim to plant one billion trees by 2028 and aim to play a major role in tilting the scales for climate change.

Video – YouTube



Capturing and storing 4,000 tons of CO2 emissions a year which are injected into nearby basaltic rock formations and turned permanently into stone



Climate Change

ORCA

Carbon capture and storage (CCS) is a known technology – it involves capturing, transporting and storing greenhouse gas emissions from fossil fuel power stations, energy intensive industries, and gas fields by injecting the captured greenhouse gases back into the ground.

CCS has not been trialed and tested – anywhere in the world – at the scale required to tackle the climate crisis. Until now. The ORCA Plant is eradicating pollution and raising air quality through the world's first-ever CO2 capturing facility fueled by renewable energy.

Description

Trees and vegetation are not the only form of carbon drawdown from the atmosphere. Vast quantities of carbon are naturally stored in rocks. Carbfix imitates and accelerates these natural processes, where carbon dioxide is dissolved in water and interacts with reactive rock formations, such as basalts, to form stable minerals providing a permanent and safe carbon sink. The Carbfix process captures and permanently removes CO2.

The technology provides a complete carbon capture and injection solution, where CO2 dissolved in water – a sparkling water of sorts – is injected into the

Entity

Reykjavik Energy

Region and location

Europe – Iceland

Core technology

Carbon Capturing, Ecological Science

ORCA

subsurface where it reacts with favorable rock formations to form solid carbonate minerals via natural processes in about 2 years.

For the Carbfix technology to work, one needs to meet three requirements: favorable rocks, water, and a source of carbon dioxide.

Carbonated water is acidic. The more carbon you can pack into water, the more acidic the fluid will become. Carbfix's carbonated water reacts with rocks underground and releases available cations such as calcium, magnesium and iron into the water stream. Over time, these elements combine with the dissolved CO2 and form carbonates filling up the empty space (pores) within the rocks. The carbonates are stable for thousands of years and can thus be considered permanently stored. The timescale of this process initially surprised scientists. In the Carbfix pilot project, it was determined that at least 95% of the injected CO2 mineralizes within two years, much faster than previously thought.

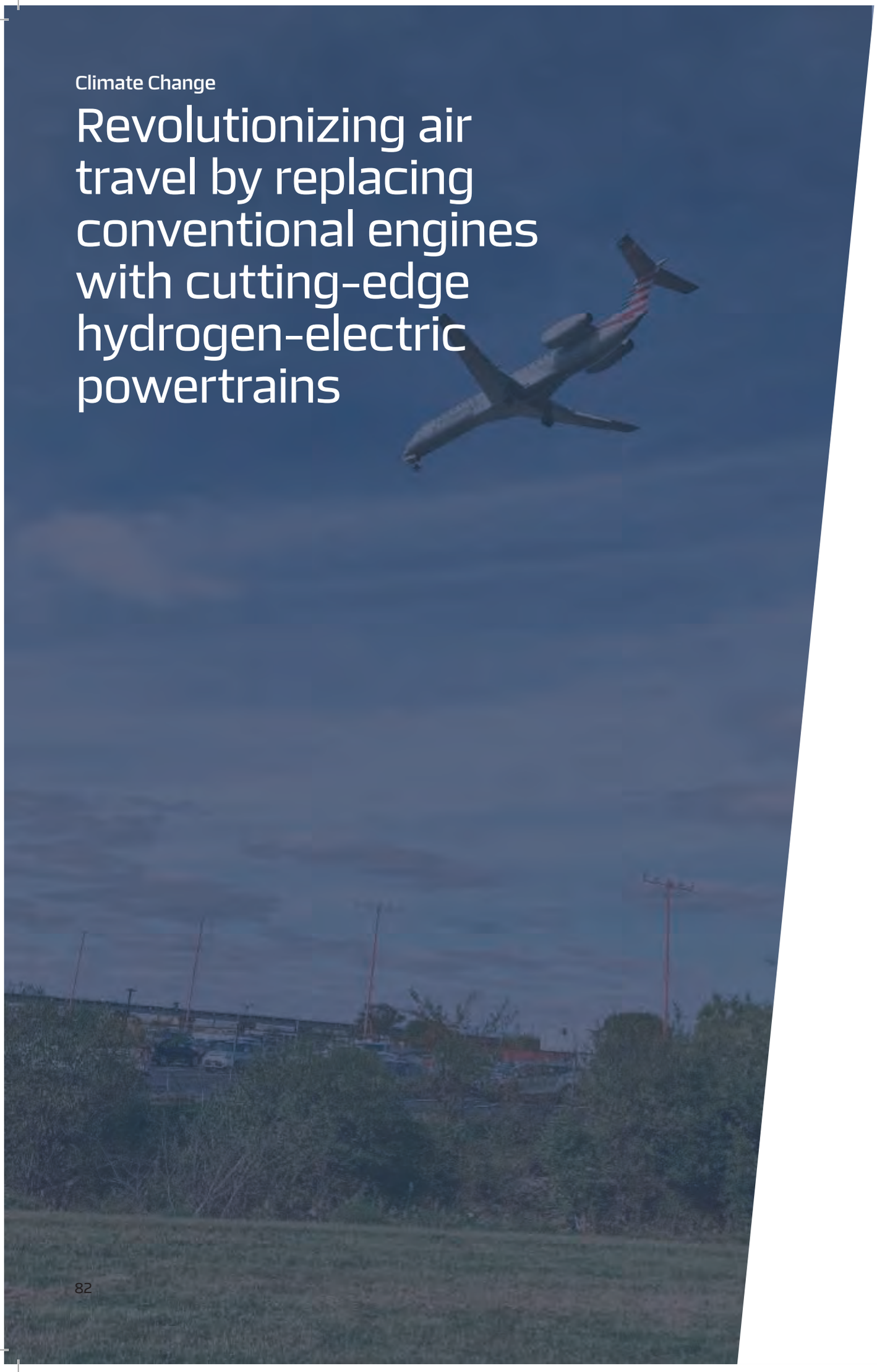
The injected carbonated water is denser than the surrounding water in the geological formation and therefore has the tendency to sink after it has been injected. This is in differs from more conventional methods of carbon capture and storage, which depend on cap rock to prevent possible leakage of gaseous CO2 injected into deep formations.

Young basaltic rocks are highly fractured and porous such that water seeps easily through the interconnected cracks and empty spaces underground.

Video - YouTube

Climate Change

Revolutionizing air travel by replacing conventional engines with cutting-edge hydrogen-electric powertrains



Climate Change

ZeroAvia

Air travel has become a necessity of our daily lives. Although the pandemic has cut some routes and daily departures, it is now rapidly increasing as ever before.

The global aviation industry produces around 2.1% of all human-induced carbon dioxide (CO2) emissions. Aviation is responsible for 12% of CO2 emissions from all transport sources.

ZeroAvia has a solution for the Aviation industry: providing the air industry with Hydrogen-electric propulsion to eradicate CO2 emissions from air flight.

Description

Today, aviation is the fastest-growing source of greenhouse gas emissions. Pre-pandemic, 4.5 billion passengers were carried by the world's airlines which produced 915 million tons of CO2 annually.

Furthermore, Climate Change is also affected by other substances emitted by aircraft: significant amounts of NOX, contrails, and particulates matter have a specific warming effect of its own. Released at high altitudes, aviation emissions have 2–4x the impact of comparable ground source emissions. Overall, they amplify the climate impact of aviation, and are mostly overlooked by the industry.

Entity

Department for Business, Energy & Industrial Strategy

Region and location

Europe – United Kingdom

Core technology

Hydrogen Propulsion

ZeroAvia

ZeroAvia is tackling this issue by creating a hydrogen-electric propeller and turbine engine that can be retrofitted to any certified fixed-wing airframe model to retrofit and line fit, simplifying regulatory issues and reducing time to market.

Hydrogen-electric propulsion is the only way to scale sustainable aviation for commercial use – with up to 30 times higher specific energy and lower cycling costs than lithium-ion batteries, and numerous advantages over all other decarbonization solutions, hydrogen-electric powertrains are the only viable, scalable solution for zero-emission aviation.

Hydrogen-electric powertrains offer a long range, lower fuel and maintenance costs, and zero emissions. Hydrogen-electric powertrains are not only the best way to decarbonize but are a superior propulsion system overall.

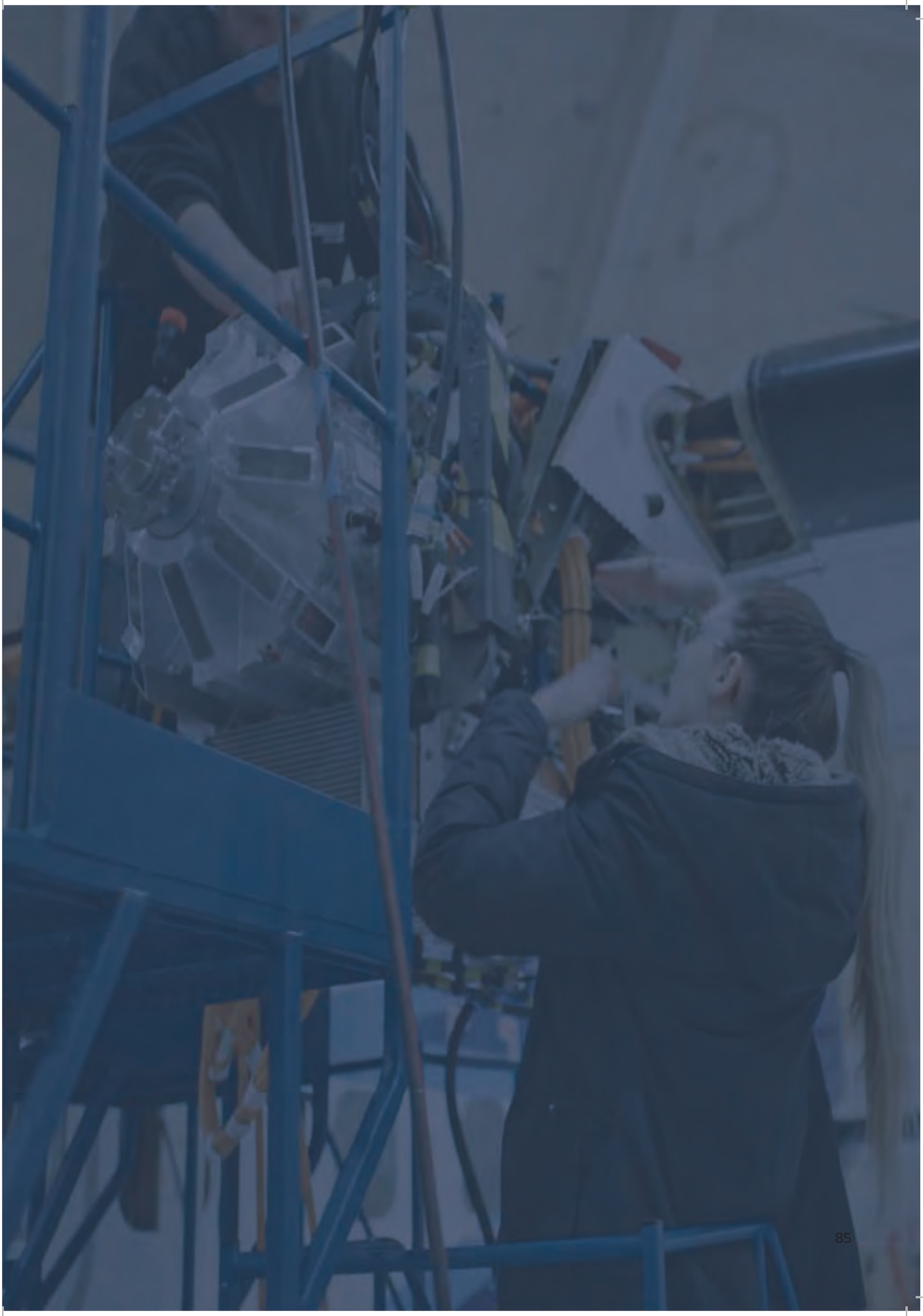
Zero-emission aviation starts with green hydrogen. Green hydrogen is produced through electrolysis and stored at or near airports, to reduce transportation costs that traditionally drive up the price of hydrogen. The electrolyzes are powered by locally generated renewable energy.

Green hydrogen powers electric propulsion using the fuel cells. Renewable hydrogen stored in tanks is converted to electricity in flight using a fuel cell, which then powers the electric motors.

Hydrogen powertrain are also safer than conventional jet fuels. Non-toxic hydrogen and compressed gas storage is more reliable with less severe consequences in the event of failure. Compressed hydrogen tank integrity is superior to conventional liquid fuel tanks. Also, hydrogen has a lower radiant heat than conventional gasoline.

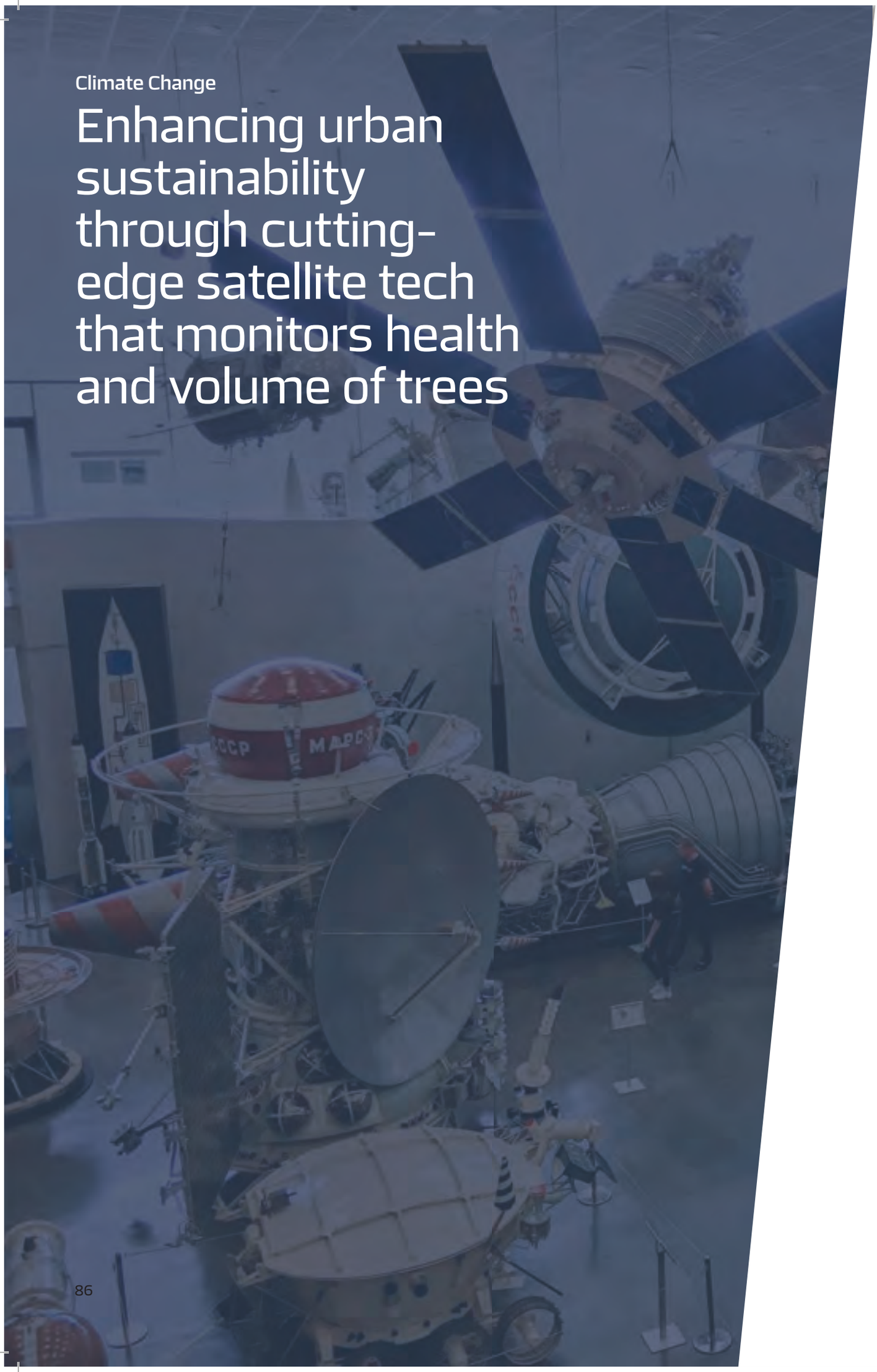
By 2024 green air transportation will become a reality with ZeroAvia offering 10–20 seats 300 NM range commercial offering.

Video – YouTube



Climate Change

Enhancing urban sustainability through cutting-edge satellite tech that monitors health and volume of trees



Climate Change

TreeView

Various countries with strong agricultural and forestry backgrounds have always had a strong interest in controlling their forests and crop. This has never been an easy task.

Trees are also a natural carbon-sink and are vital to support diverse ecosystems. It is therefore vital to monitor closely their existence and health and TreeView will enable precision forestry and management to be achieved remotely from space on a national and global scale, supporting a nature-based solution to climate change.

The project is currently under development.

Description

There is a strong requirement for near real-time monitoring forests and crops to tackle the present challenges within agriculture and forestry. VHR satellite imagery provides a solution and has already been used successfully in several projects.

Agriculture provides us with food, fuel, fibers and raw materials that are imperative to our everyday lives. However, food security in the face of climate change continues to challenge us. Under the 2030 UN Agenda, the FAO has highlighted the need to invest in agriculture including crops, livestock, and forestry.

Entity

UK Space Agency, sponsored by the Department for Business, Energy & Industrial Strategy

Region and location

Europe – United Kingdom

Core technology

Satellite, Software

Climate Change

TreeView

The world's population is rising and is expected to grow to more than 10 billion people by 2050. To accommodate this growth, it is estimated that agricultural production will need to expand to 70% by 2050. Agriculture not only plays a major role in global food security but can also be used to combat climate change.

Globally the world emits over 36 billion tons of CO2 each year. Forests are an important resource in reducing these emissions. Stopping deforestation, restoring forests, and improving forestry practices could cost-effectively remove up to 7 billion tons of CO2 annually. Therefore, forests are a critical factor in combating climate change and a resource that needs protection.

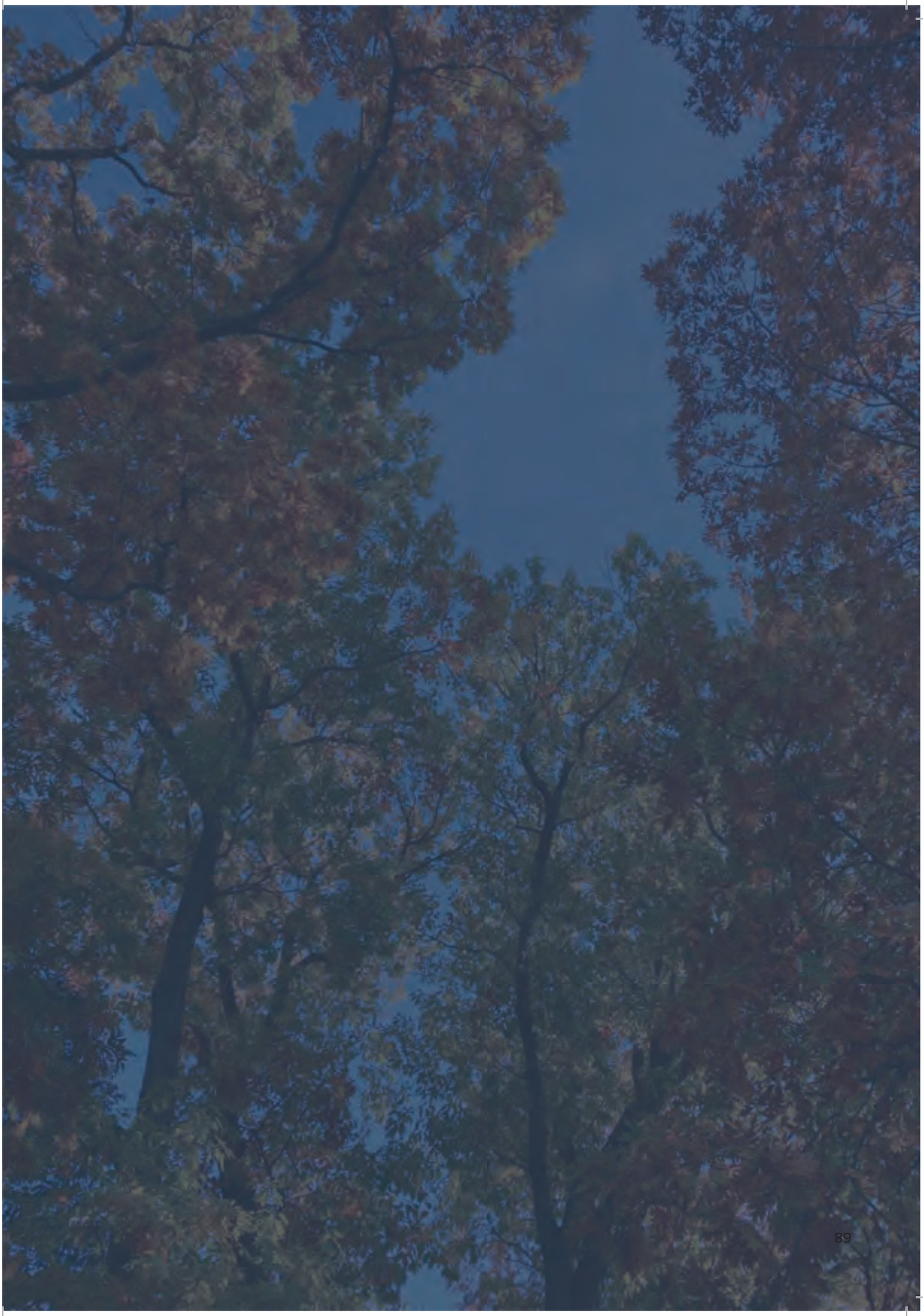
There is a strong requirement for monitoring forests and crops to tackle the present challenges within agriculture and forestry. Near real-time monitoring is crucial to react to extreme events - such as climate conditions or pest infestations - and thus minimize their impact, while also optimizing management practices - such as precision agriculture - in a sustainable manner.

For example, optical satellite imagery can be used to capture vines during the Véraison period. Monitoring crop vigor at this stage gives the winemaker time to modify management of individual vines with the goal of optimizing the harvest.

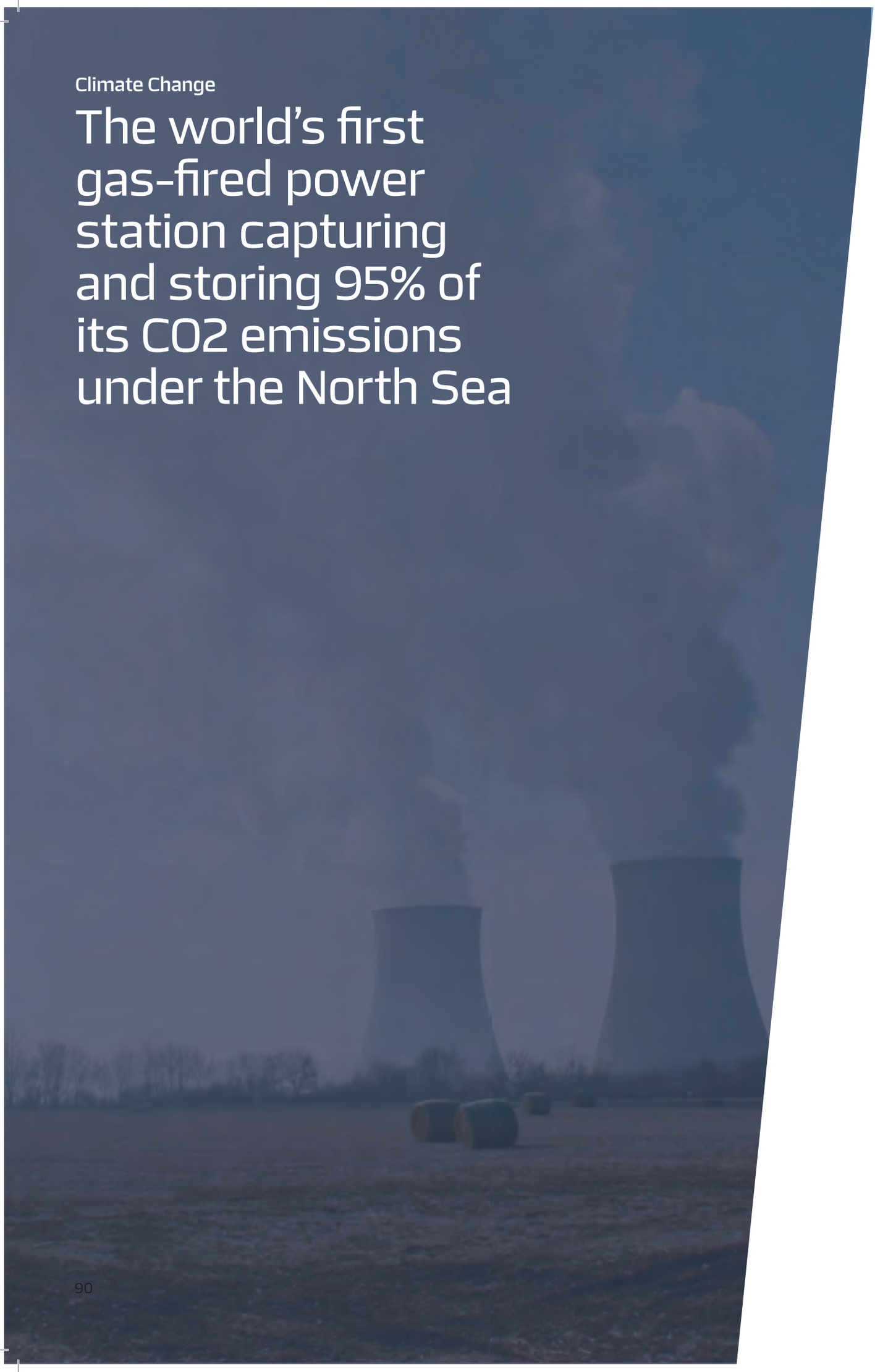
When compared to traditional methods such as ground-based measurements, the value of satellite imagery is clear. It allows for larger areas of the vineyard to be covered in a shorter amount of time providing increased cost and time savings.

In conclusion, by remotely sensing from their orbits high above the Earth, satellites provide us with much more information than would be possible to obtain solely from the ground.

Link 1 – GOV.UK



The world's first gas-fired power station capturing and storing 95% of its CO2 emissions under the North Sea



Climate Change

Net Zero Teesside

About 28% of global CO_2 emissions can be traced to energy generated to light, cool, and heat buildings, while a fifth of UK's emissions come from heating and powering homes. So, a good chunk of your carbon footprint can be laid down before you've even left the house.

By 2025, Net Zero Teesside Power will be the world's first commercial-scale gas-fired power station to utilize carbon capture technology. Even more excitingly, this plant will serve as the hub of a decarbonized cluster of industries on Teesside that will share the CO2 transportation and storage infrastructure – the effect of which is equivalent to energizing 1.3 million homes.

Description

Teesside has always been at the heart of the UK industry. Local industries powered by obsolescent technology have, over time, made it the second most polluted area in the UK aggravating on what was an already heavily polluted area.

The UK Government has committed to achieving net zero emissions by 2050 and Carbon Capturing Utilization Storage (CCUS) is critical to achieving this. Without it, the target possesses a real challenge to the future of British industry and jobs, as CCUS is the only way to decarbonize many industries.

Entity

Environment Agency –
United Kingdom Government

Region and location

Europe – United Kingdom

Core technology

Carbon Capturing, under-water storage and Hydrogen Technology

Net Zero Teesside

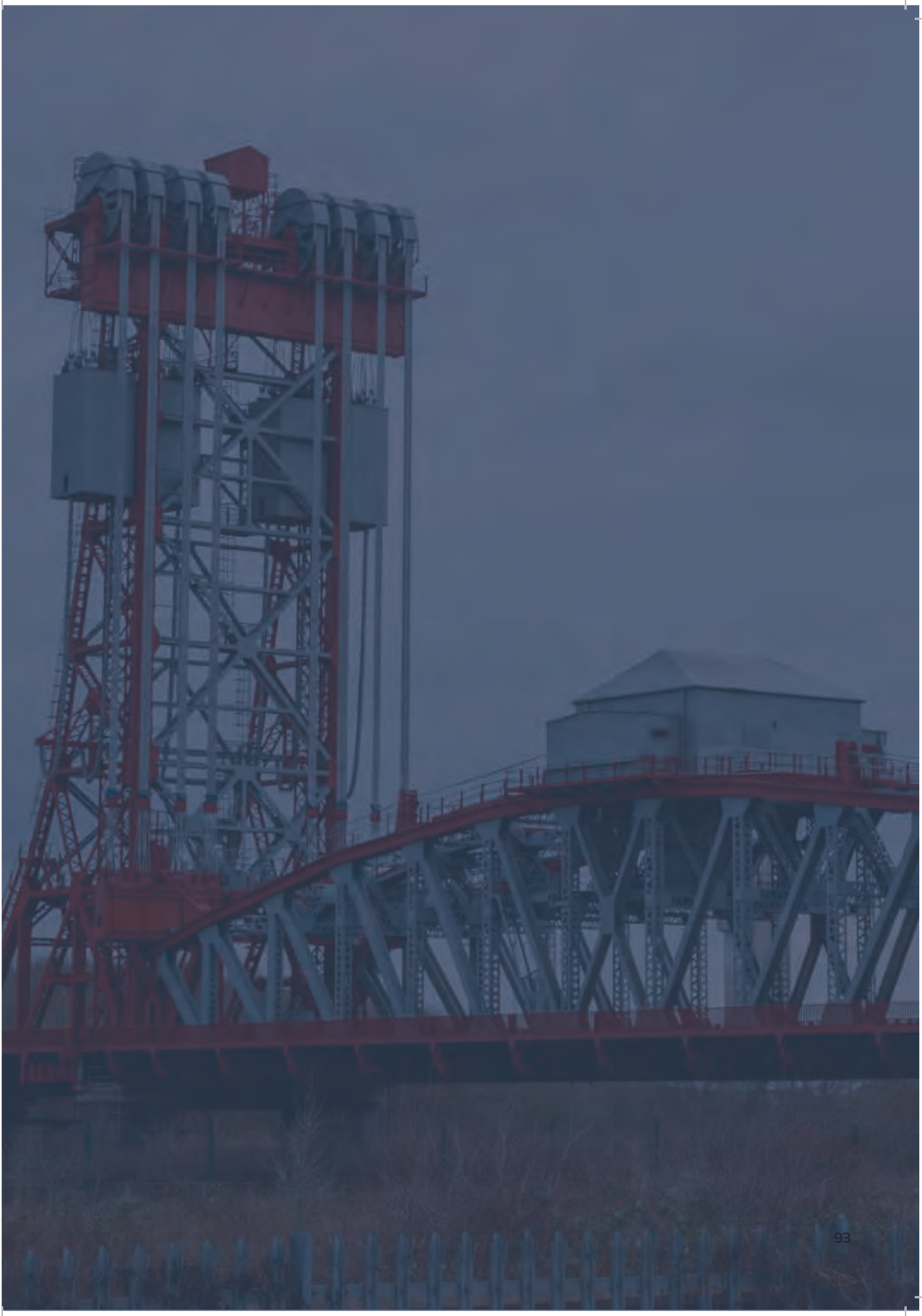
Today with Net Zero Teesside (NZT) Power has become a part of the climate change solution. NZT Power is an opportunity to offset a huge amount of CO2 production.

NZT Power will capture carbon dioxide from a cluster of local heavy industries and transport it for safe storage deep under the North Sea.

The project will also build a new gas fired power station with state-of-the-art carbon capture technology to provide low carbon power and back up renewable resources. The combination of these factors has the potential to revitalize Teesside and the Northeast and protect the longevity of the local industry, stimulate new low carbon industries and kick start the Hydrogen era.

It is a flagship project, the first in its kind, providing 2M new jobs and lead the fight in climate change. Removing carbon dioxide from industrial emissions is a vital part of safeguarding the future British industry.

Video - YouTube



Climate Change

A first step towards sustainable transport: launching the world's first autonomous hydrogen vehicle

Climate Change

Smart Bus

While electric vehicles are seeing rapidly growing sales and are widely seen as the future of emissions-free motoring, hydrogen vehicles are still somewhat overlooked. However, some large Japanese and Korean players in the auto industry seem to be making big investments in fuel cell (hydrogen) powered vehicles.

The Estonian government highlighted its commitment towards sustainable transport by becoming the first country in the world to launch the autonomous hydrogen powered smart bus.

Description

Despite the booming electric vehicle market, many vehicles manufacturers are promoting the development of hydrogen-powered cars, trucks and buses. In theory, fuel cells are an ideal alternative to the internal combustion engine, since their chemical reactions of hydrogen and oxygen emit no carbon.

In recent times, hydrogen-powered cars have become the focus of many car manufacturers. At the 4th CIIE in 2021, the car exhibition showcased significant focus on hydrogen vehicles from manufacturers and car parts providers.

Entity

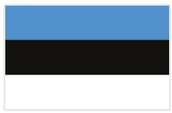
Estonian Road Administration for public traffic

Region and location

Europe – Estonia

Core technology

Autonomous transport, hydrogen-powered



Unique Breakthrough

Smart Bus

In 2021, the Estonian enterprise Auve Tech, in cooperation with University of Tartu researchers, presented the first autonomous hydrogen-powered passenger vehicle to the public.

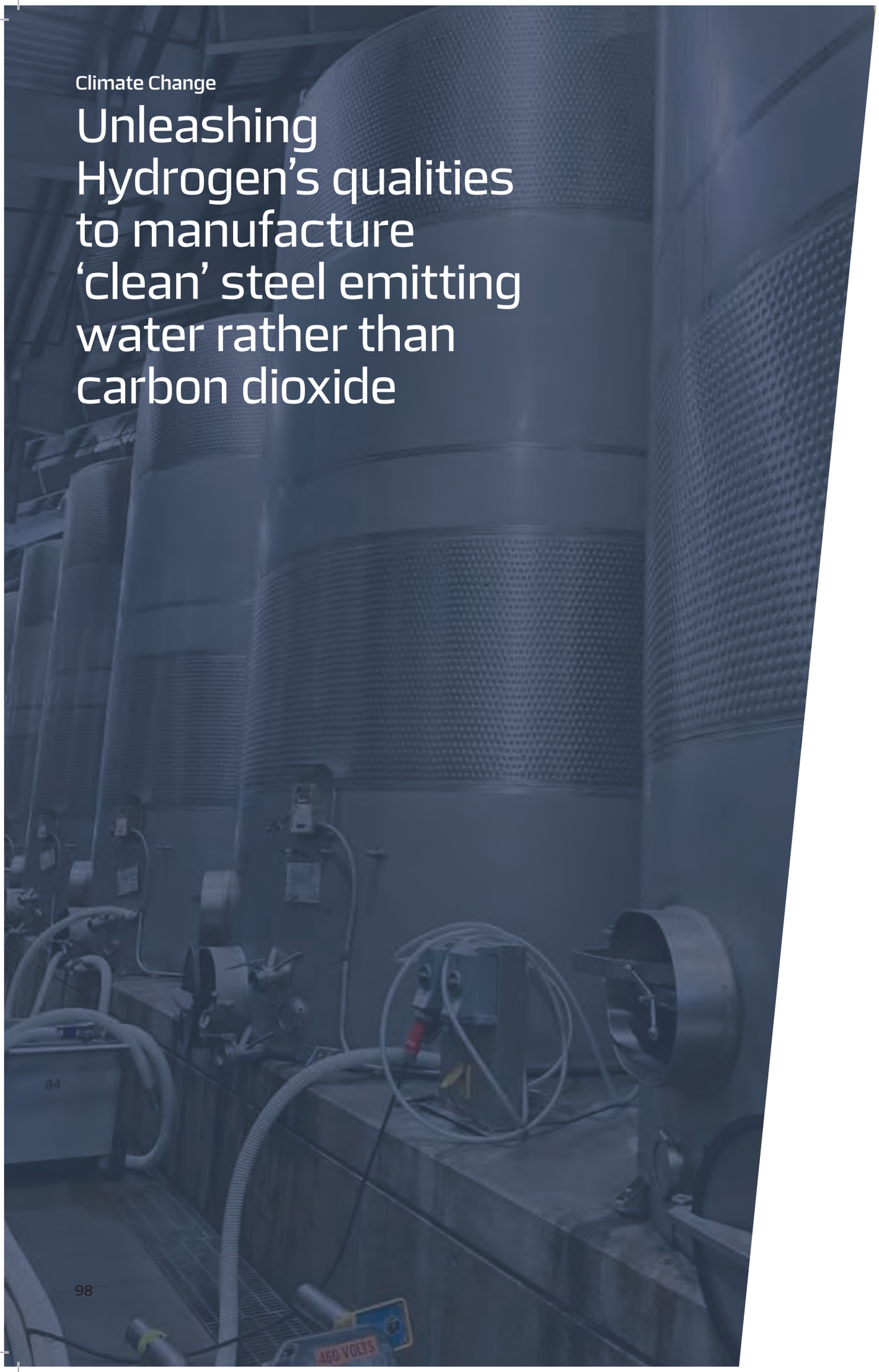
The shuttle is powered by low-temperature hydrogen cells which produce energy from hydrogen right inside the self-driving shuttle. Seating up to six passengers, it is primarily aimed at enhancing last-mile transportation. The shuttle can drive without human interference both in public traffic and semi-closed areas while its movements can be monitored and, if necessary, corrected by remote control. The hydrogen used in the hydrogen cells makes it possible to produce the electricity needed to run the shuttle inside the shuttle itself, and the only by-products are vaporized water and heat.

The development of the autonomous hydrogen shuttle is the first step towards meeting the government's goal of having at least 12% of transport in Estonia to be powered by renewable fuels by 2030. This shuttle not only highlights an important milestone for two promising future technologies, but also marks a major step towards the new reality in which people and innovative scientific solutions meet in everyday life.

Video - YouTube


LIISU
RUNS ON HYDROGEN
2
Hydrogen powered by
UNIVERSITY OF TARTU

Unleashing Hydrogen's qualities to manufacture 'clean' steel emitting water rather than carbon dioxide



Climate Change

HYBRIT

Traditional integrated steelworks use iron ore, coal, limestone, and oxygen or air to produce steel. The energy and heat from the processes come from fossil fuels, which is primarily coal. The use of fossil fuels means that the average CO2 emissions from steel production is about 1.85 tones of CO2 per ton of steel produced.

Today producing steel no longer involves heavily polluting the environment as HYBRIT – the world's first fossil-free steel project – aims to replace coal with hydrogen in the steelmaking process and significantly reduce CO2 emissions during steel-making processes.

Description

Using hydrogen instead of carbon during the reduction of iron ore to iron is the most sustainable and technically promising option for the iron and steel industry. A switch to hydrogen would mean major changes in the energy system, iron ore refining and steel production. HYBRIT is developing the technology and the value chain for hydrogen-based iron and steel production for a fossil-free future.

HYBRIT (Hydrogen Breakthrough Ironmaking Technology) has developed a fossil-free value chain for iron and steel.

Entity

Swedish Energy Agency

Region and location

Europe – Sweden

Core technology

Hydrogen to create fossil-free steel

HYBRIT

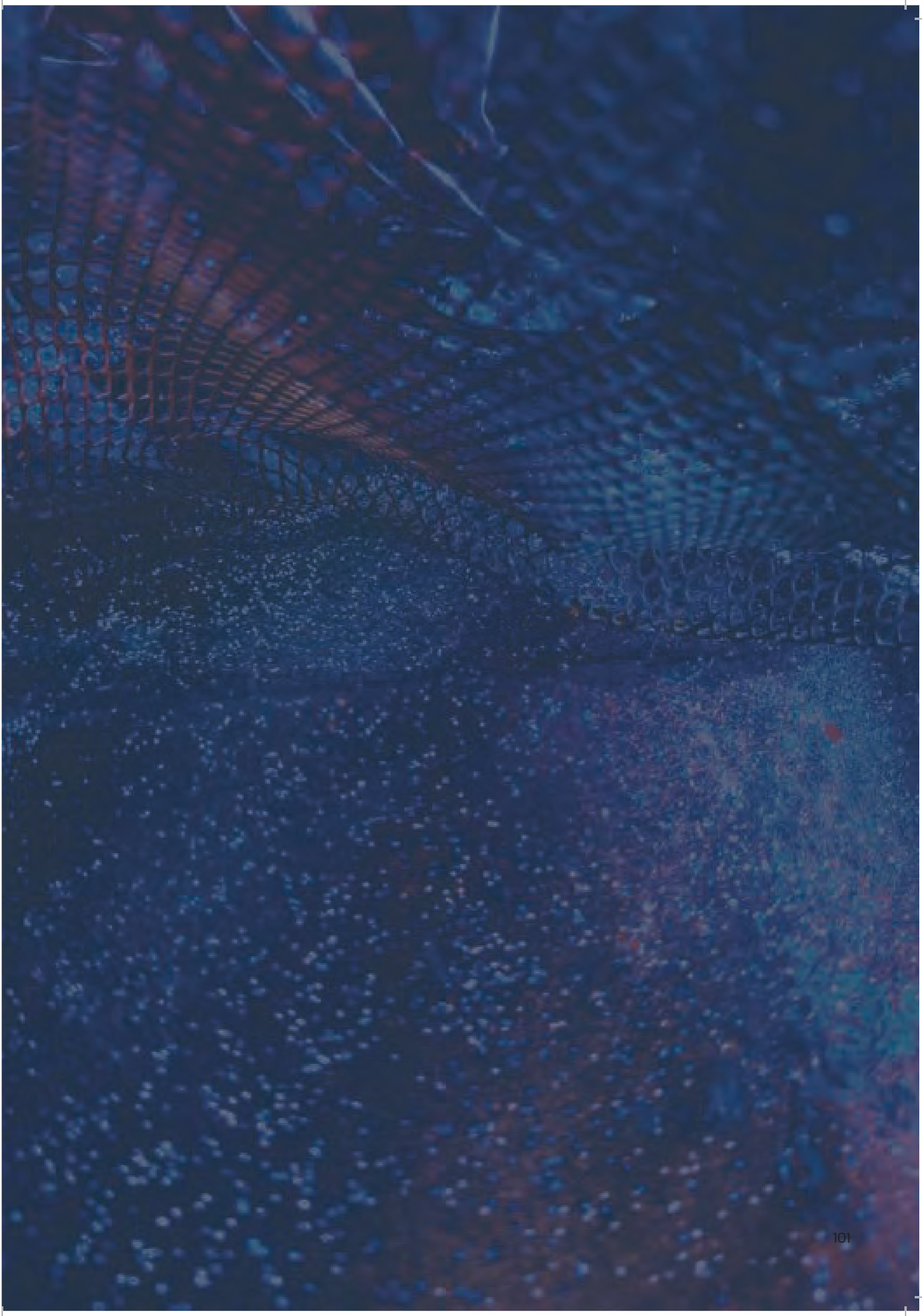
Production using fossil-free electricity and hydrogen, thus minimizing the carbon dioxide emissions throughout the value chain.

The HYBRIT technology involves replacing the blast furnace process, which uses carbon and coke to remove the oxygen from iron ore, with a direct reduction process where we use fossil-free hydrogen produced from water using electricity from fossil-free energy sources. Instead of carbon dioxide, water vapor is formed. The HYBRIT technology allows for the world's first fossil-free reduction of iron ore to give sponge iron, a central step for fossil-free iron and steel production.

The hydrogen storage facility will play a very important role in the overall value chain for fossil-free iron and steel production. Production can take place without a storage facility, but storage provides the opportunity to vary the demand for electricity and ensure stable production. The hydrogen storage facility has a stabilizing effect on the electrical system. It reduces the risk of the system overloading. The HYBRIT technology was developed with an eye towards the future so that it is in line with the future electricity system with more weather-dependent electricity generation.

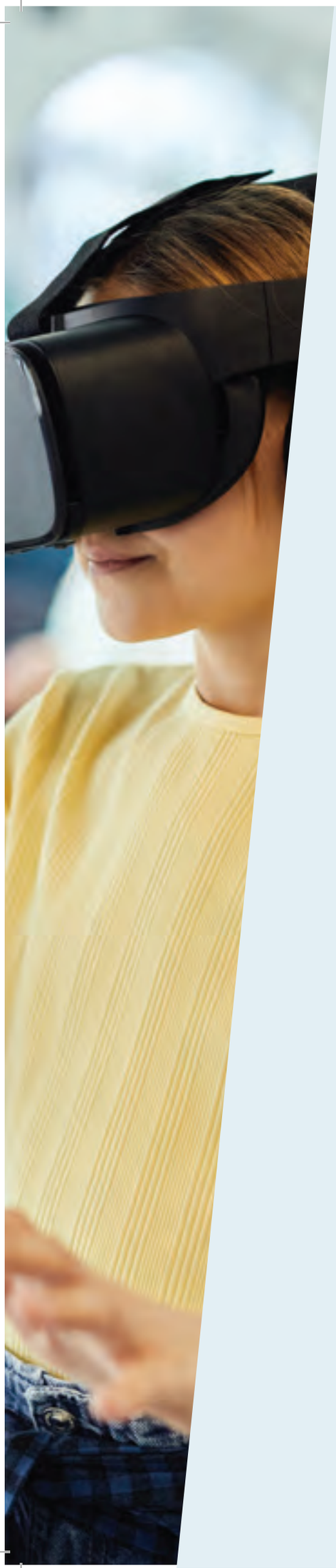
Construction of the hydrogen storage facility began in May 2021 and the plan is for the plant to come into operation during the summer of 2022. The tests will then continue until 2024. The technology has the potential to reduce Sweden's CO2 emissions by 10% and Finland's by 7%.

Video – YouTube



Remote learning

How fearless Governments preserve wellbeing and foster inclusion



Connecting people virtually through technology platforms

The COVID-19 pandemic has forced government institutions to implement a range of measures to curb the impact on education.

This world catastrophe prompted interventions with technology-based models to redress not only education but also the more frequent mental health and wellbeing problems amongst students.

Governments had to react quickly and embrace innovation-driven solutions to create comprehensive virtual environments that can preserve children wellbeing, foster participation and inclusion.

Remote Learning

Hybrid robotic solution for virtual attending students to improve remote learning and increase children participation, confidence and mental health

Remote Learning

AV1

It is known that children who are absent from school for a significant period have academic challenges on return to school, along with social, and psychological problems. 20% of these children end up repeating a grade.

No Isolation, in collaboration with the Ministry of Education in the UK, developed AV1 – a robotic "helper" that mitigates social isolation's negative effects on mental health, and allows children to keep up with their schoolwork and learning progress.

Description

The MoE funded the largest ever AV1 research project, named APIF (Alternative Provision Innovation Fund), to investigate AV1s ability to support the reintegration of children after a period of school absence due to poor health.

The AV1 is placed on a desk in the classroom, while the child is at home connecting to the device via either a smartphone or tablet. The child can fully control the AV1 and interact with the class and students using the inbuilt camera, microphone and speaker on the AV1. This enables them to participate as if they were physically present.

Entity

Ministry for Education

Region and location

Europe – United Kingdom

Core technology

Teaching robot supported by Artificial Intelligence

Remote Learning

AV1

One of the advantages of the AV1 over other remote learning tools is that it is compact and sturdy, meaning it can be carried between classes and outside, so students don't miss any part of school life. It comes with an integrated 4G sim card, meaning it can be taken out into the playground, on school trips, etc.

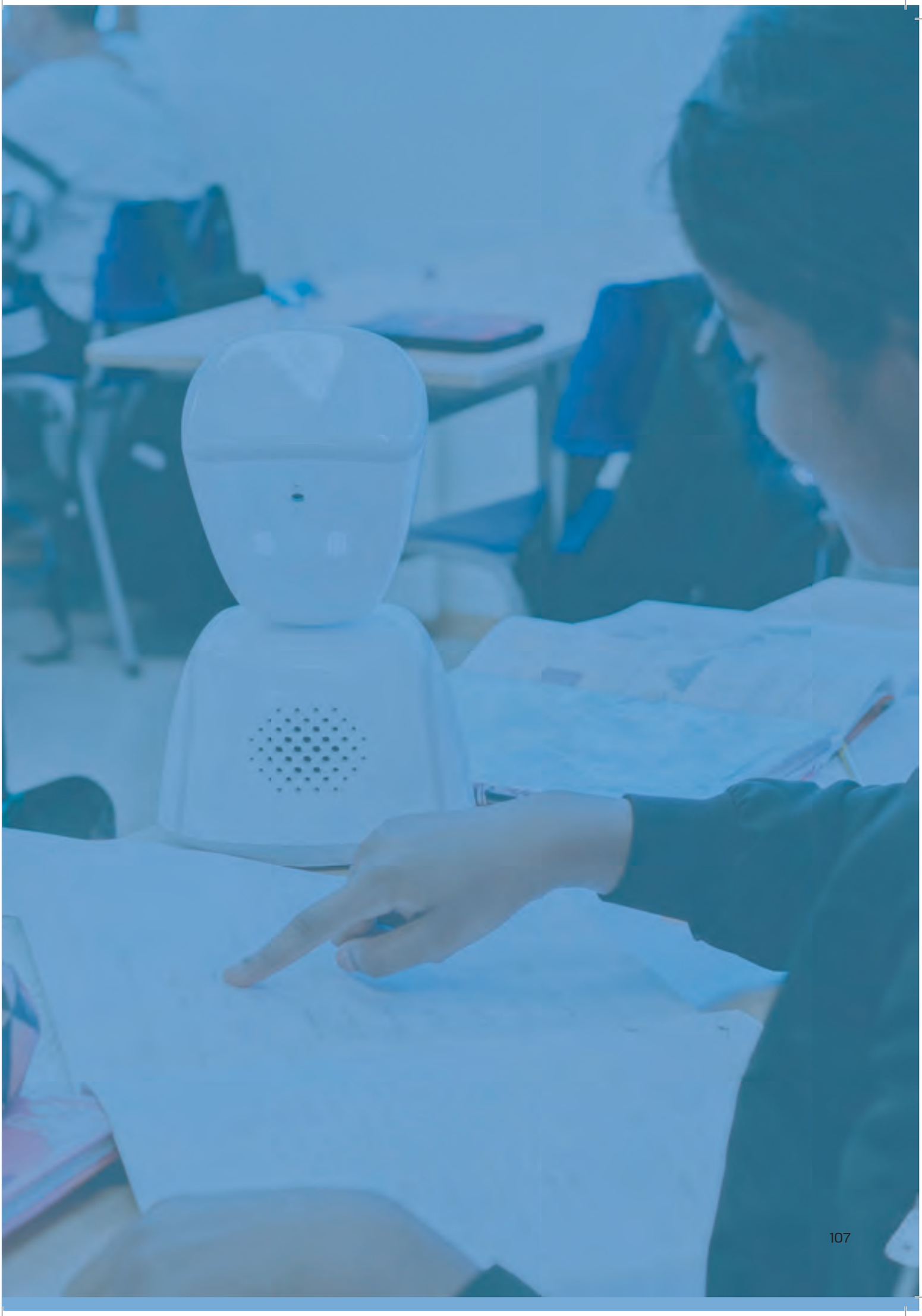
To date, AV1s have enabled over 50% of students to:

1. Increase their attendance and keep up with schoolwork and peers
2. Improve their mental health and confidence
3. Engage more with learning
4. Improve relationships with their teacher and classmates
5. Make greater progress in lessons and achieve higher grades than expected
6. Avoid referral to Alternative Provision (AP) or hospital school

AV1 supports a smooth reintegration back into school. Following a period of absence, students can return feeling more confident in themselves both socially and academically. After the implementation of the AV1, a survey of educational leaders revealed that over 75% agreed that AV1 increased the attendance of their pupils, all the leaders agreed that AV1 enabled pupils to keep up with schoolwork, over 50% agreed that it makes greater progress with their learning, and all agreed that it improved the pupils' mental and personal development.

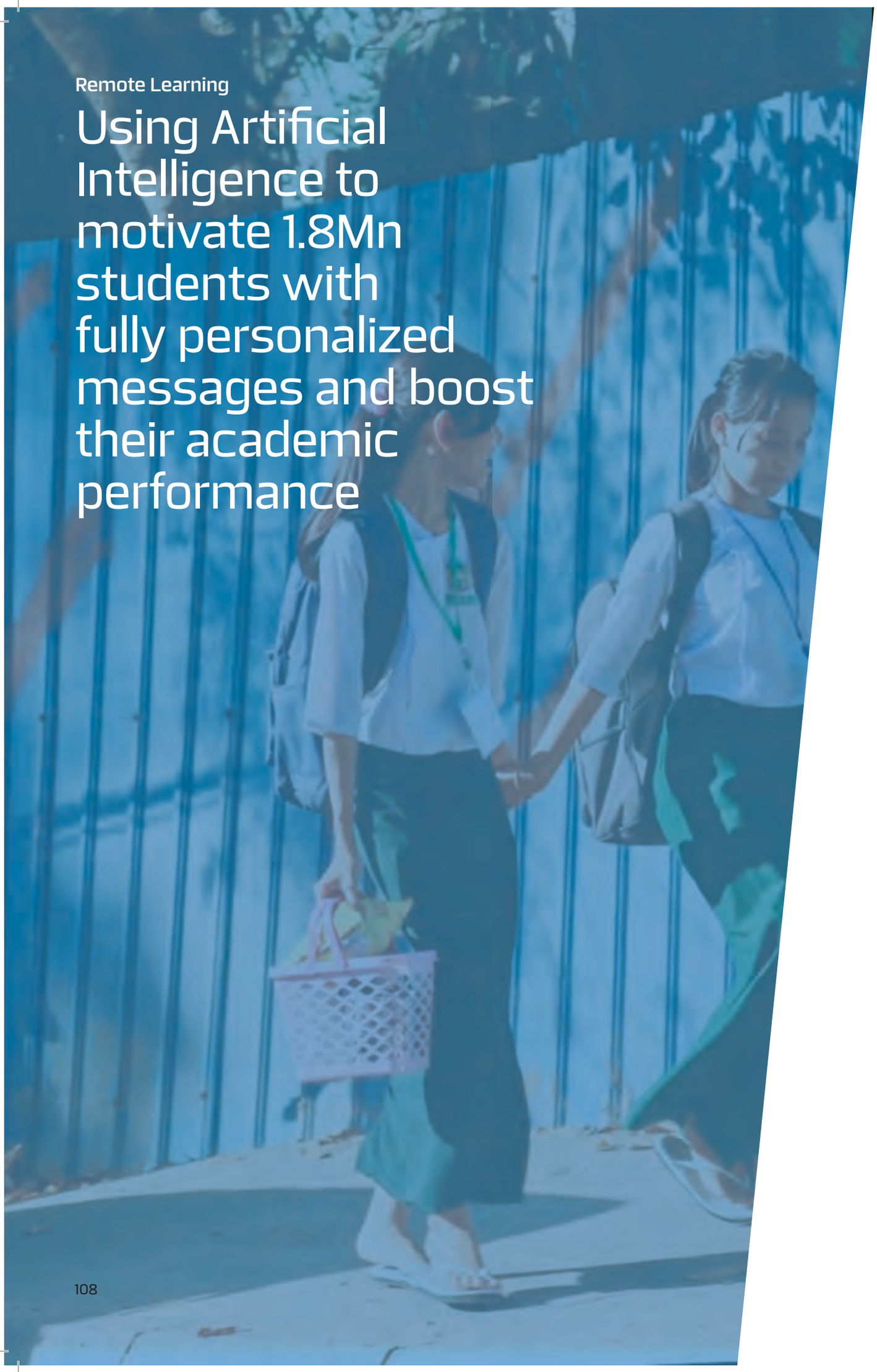
Over the last two years, 90 AV1s were distributed to UK schools with at least 650 pupils using the AV1s remotely while they could not attend classes. This has led to students attending of over 20,000 school days that would have otherwise been missed without the AV1s.

Link 1 – No Isolation



Remote Learning

Using Artificial Intelligence to motivate 1.8Mn students with fully personalized messages and boost their academic performance



Remote Learning

Eduq+

Until the global COVID-19 pandemic, most schools did not employ online learning platforms as teaching and learning methods. The pandemic forced national education systems to respond and redesign education in order to ensure continuity of learning.

With the objective of supporting education, Eduq+ sends weekly nudges with content and activities to change behavior, encouraging students and their family members to become increasingly engaged in education.

Entity

Department of Education

Region and location

South America – Brazil

Core technology

Teaching assistant using Artificial Intelligence to send notification and SMS to cell phones

Description

To address the challenge of disinterest in education within the country, the offering combines behavioral economics and artificial intelligence to improve the main educational indicators. Eduq+'s nudges motivate families and teachers to take small steps toward adopting behaviors with the potential to enhance learning.

Eduq+ sends weekly messages to parents and teachers to highlight the importance of education, encourage parents to be more involved in their children's school life, and motivate and support teachers to show up in class.

Remote Learning

Eduq+

Schools can also communicate directly with parents through a tablet-based platform that enables seamless broadcasting of school announcements and organized communication with parents about their children's attendance and school performance.

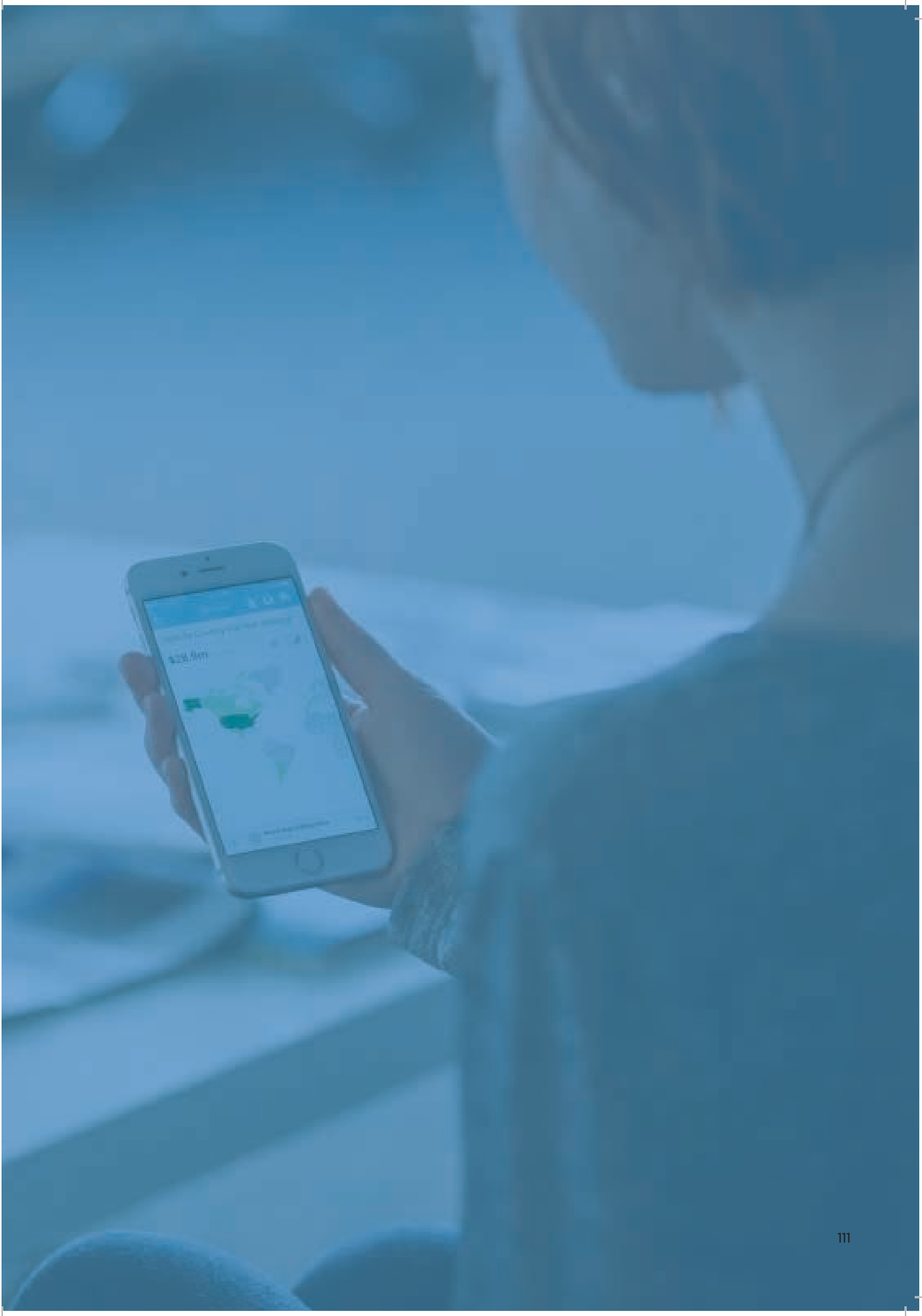
The more widely the nudgebots are used, the more children feel supported by their parents and teachers, improve socio-emotional skills, become more engaged in school activities, have higher attendance, and improve their performance.

The nudges communicate with families, teachers and school managers. For families, the goal is to bring the families and schools closer together. Content includes supporting families in their daily life, encouraging parents to change their behavior, reminders and memos sent to parents' phones directly, adoption of best practices and technology, and behavioral change.

The success of the platform has been highlighted in two studies conducted by Stanford University and University of Pennsylvania. The results show that the nudges have led to:

- 33% reduction in grade repetition
- 15% increase in student attendance
- 50% decrease in student dropouts
- Improvement in math proficiency, numeracy, and literacy as if nudged students were one school quarter ahead

Video – Movva.tech



Remote Learning

Launching the world's first virtual-reality school with classrooms based in the metaverse

Remote Learning

Optima Classical Academy

In 2020, the school-world was abruptly flipped around and moved into online learning and delivering “Zoom School”. While this was the new norm, Optima Domi pioneered the use of virtual reality (VR) technology to have school in the metaverse.

Students were able to have a class together as avatars and continue the relationships that they had developed with their teachers and with their fellow scholars while in person.

Description

Most parents, teachers, and students recognize that online school education needs to improve quickly to meet the needs of learners today. So far, conventional online education has been primarily self taught and lonely. However, Optima Classical Academy has adopted a unique approach to online learning by developing a school where students learn in the metaverse using virtual reality.

Through live instructions with a highly competent and engaged teacher, students can optimize their online learning experience and enjoy the freedom of a more flexible and individualized learning environment.

Entity

State of Florida

Region and location

North America – United States of America

Core technology

Teaching tool using Augmented Reality and Virtual Reality

Remote Learning

Optima Classical Academy

Students will receive live instructions in the metaverse (VR classroom that could be situated anywhere in the world and/or from any time period) and experience an immersive, collaborative, and socially appropriate experience with their instructor and peers between 8:00 and 12:00. Thereafter, students will have asynchronous learning, including their assignments for that day, that can be completed on their own schedule.

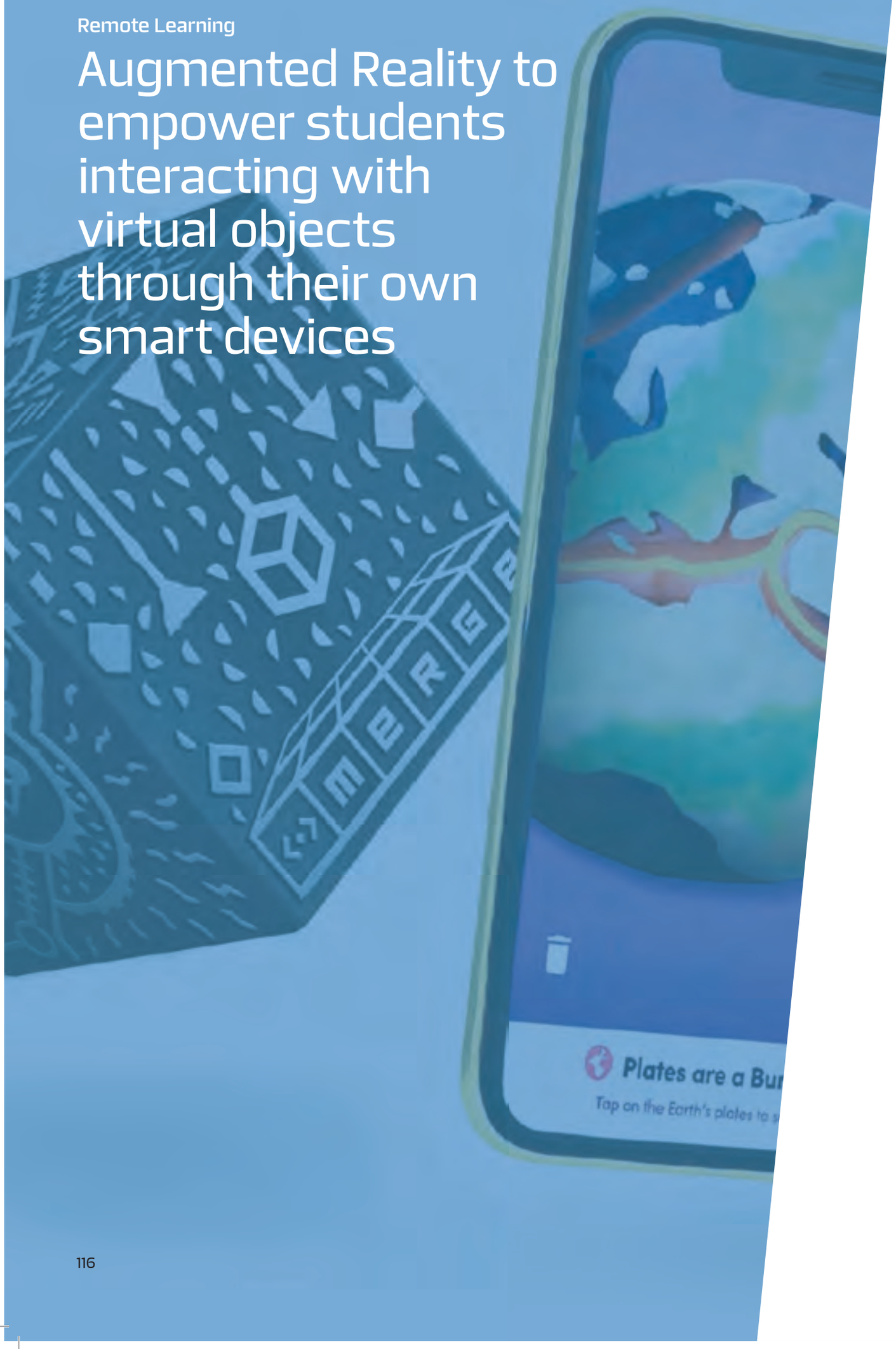
The learning timetable had been developed with flexible working environments and child-parent needs in mind. Some families need full-time care during a traditional workday, some only require part-time, and some off-hours. The goal is to pair families with similar childcare needs together, deliver a more flexible, yet higher quality form of virtual education, and help families maximize their time together.

Optima Classical Academy is the first and only classical virtual charter school and will be available tuition-free to students in grades 3-8 across the state of Florida in August of 2022. The school will enroll up to 1,300 students for its inaugural classes in 2022 and plans to extend VR classes through the 10th grade for the 2023-24 academic year.

Link 1 – Ein News
Link 2 – Euro News

Remote Learning

Augmented Reality to empower students interacting with virtual objects through their own smart devices



Remote Learning

MERGE CUBE

It is very challenging to create and provide authentic, real-life experiences via online and e-learning courses. Virtual reality (VR) and augmented reality (AR) promise the potential to overcome these challenges and provide this authentic engaging experience to students.

Merge Cube and its supporting platform, Merge Edu, provide hands on experiences that often remains in the bounds of virtual lab simulations. It is a digital equipment that extends learning beyond the limitations of device screens by giving students the ability to interact with virtual objects in 3D

Description

Two-thirds of students are visual-spatial learners and need differentiated instructions that engages multiple senses. Augmented reality and virtual reality techniques are going to be an integral way of providing realistic simulations in today's remote learning environment. This is especially useful for health professionals and even patients in understanding their diagnosis.

The Merge Cube is a digital teaching aid that lets students hold digital 3D objects, enabling an entirely new way to learn and interact with the digital world.

Entity

Queensland Government

Region and location

Oceania – Australia

Core technology

Mobile app supported by Virtual Reality and a 'smart' cube

Remote Learning

MERGE CUBE

The tool has been developed to be used in classrooms, homes, and in remote learning settings. It engages kids in hands-on activities that let them learn and explore in amazing new ways.

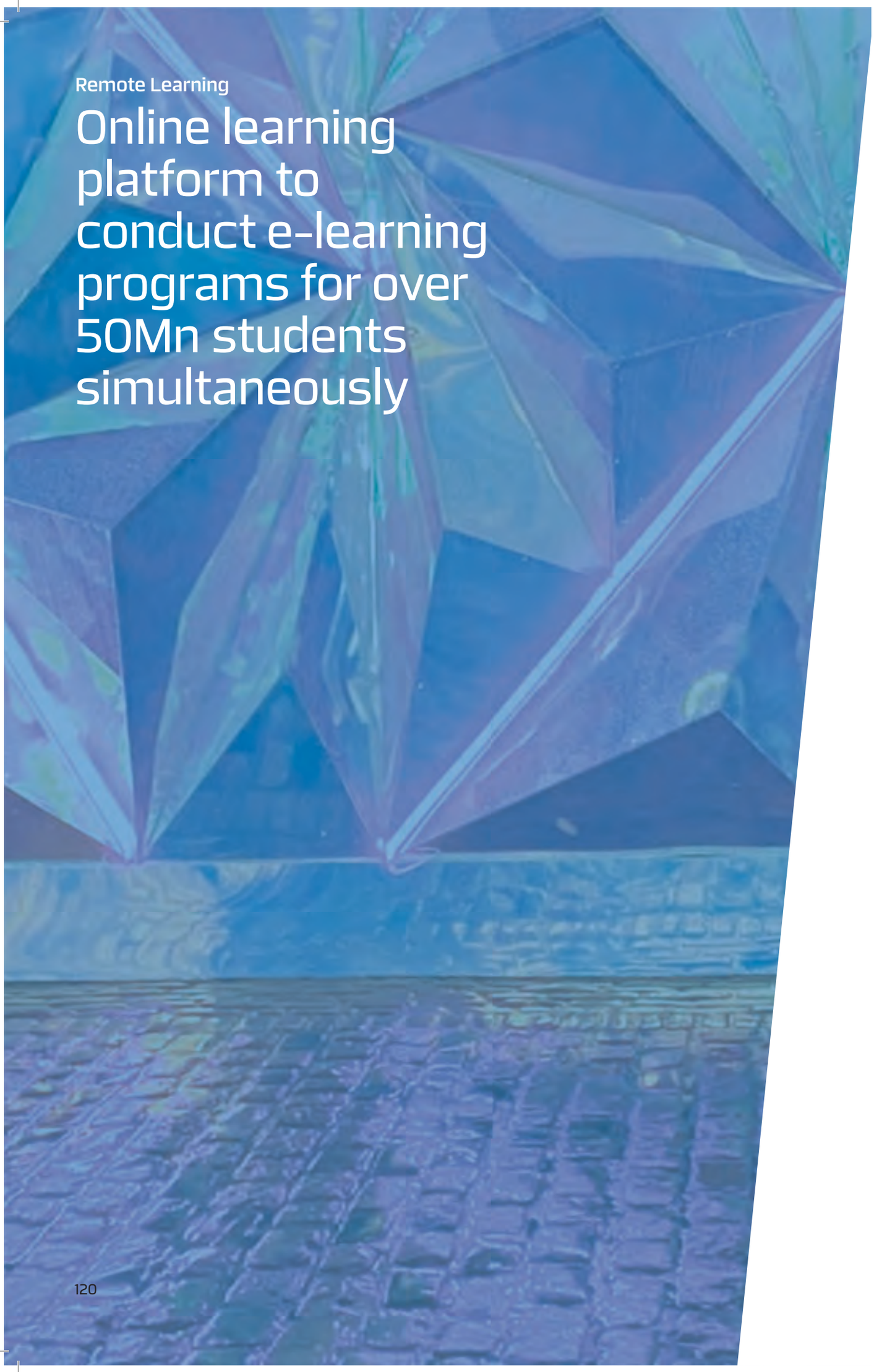
The Queensland government partnered with Merge Cube to create a clinical education tool for students, clinicians and patients. They developed a 3D birthing mannequin which provides a realistic depiction of birth via an interactive hologram. The Merge Cube then reproduces this image using a smart device. The process to use the Merge Cube is simple, and straightforward:

1. Download and open the Merge EDU app on the device
2. Download the Merge Object Viewer app
3. Launch Object Viewer and browse the collections of Digital Teaching Aids
4. Swap to “Cube” mode using the dropdown at the top of the screen
5. Point the device’s camera at the Cube
6. Watch the Merge Cube transform into a Digital Object (hologram) in the palm of your hand!

For the Queensland government case study, the cube would replicate the birthing process in 3D and students would be able to interact with the model as if it were really in front of them.

Video – YouTube


MERGE



Remote Learning

Online learning platform to conduct e-learning programs for over 50Mn students simultaneously

Remote Learning

ONDLP

The COVID-19 pandemic forced schools and teaching institutions to close and move all learning activities online. This raised challenges for institutions as teaching material may not have been online-ready and teachers not familiar with teaching online.

The One Nation Digital Learning Platform, an initiative of the Chinese Ministry of Education, was developed to address these concerns and ensure all learners have access to education.

Description

A project of China's Ministry of Education (MoE) and Ministry of Industry and Information Technology (MIIT), the cloud learning platform is open to students in elementary and secondary schools, providing them with free education resources until they can return to their normal classrooms.

To support education institutions' transition to online learning, the MoE facilitated access to 22 online platforms capable of providing 24,000 higher education courses for free including 12 disciplines at undergraduate level and 18 disciplines at higher vocational level.

Entity

Ministry of Education

Region and location

Asia – China

Core technology

E-learning platform integrated with the cloud

Remote Learning

ONDLP

At school level, the MoE, together with the MIIT, launched an online portal on 17 February 2020 for primary and secondary school students in China. The platform provides digital materials for schools for online teaching and can support 50 million students using it simultaneously.

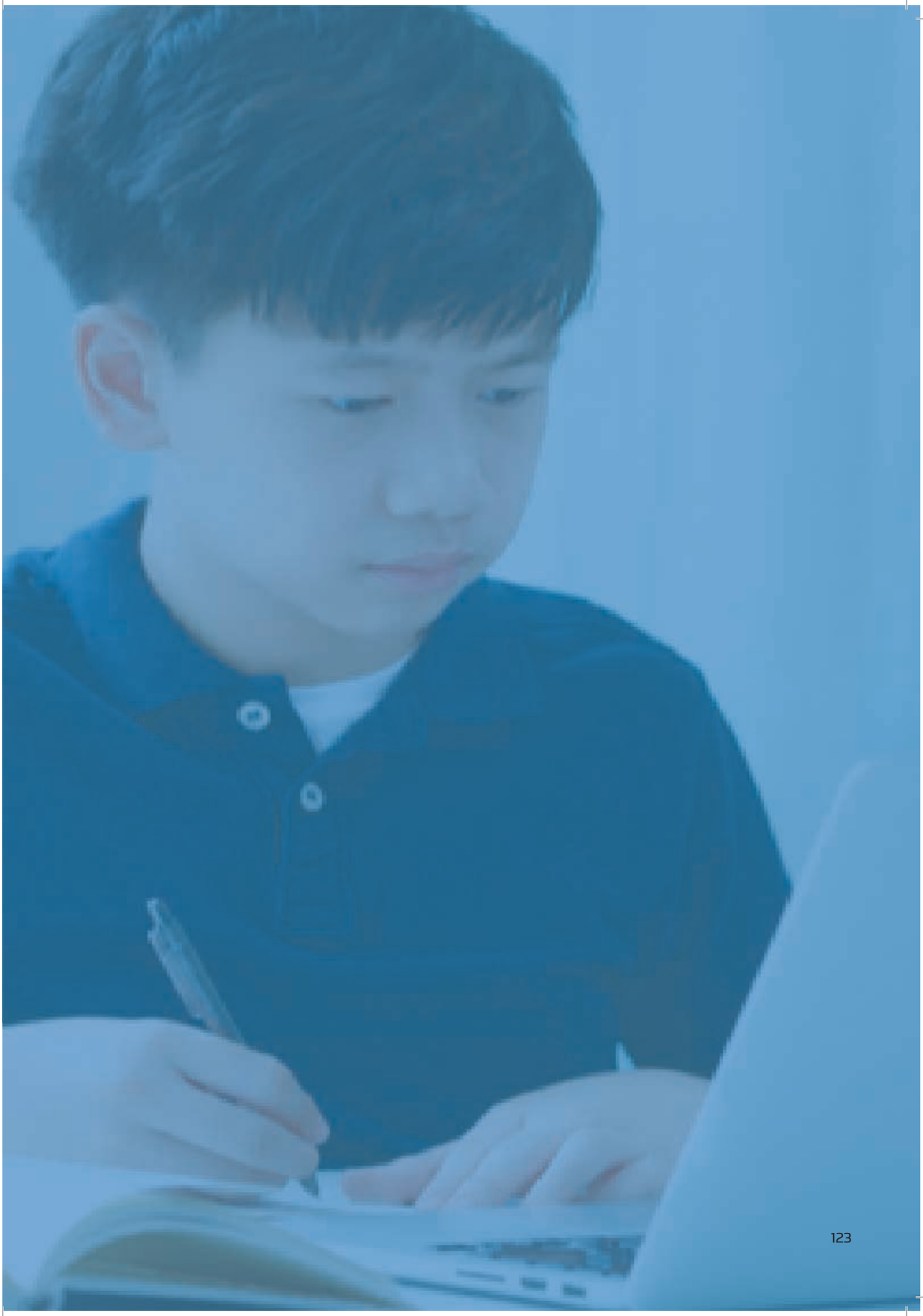
The platform provides resources in five modules developed from resources nationwide:

1. Epidemic prevention education
2. Moral education
3. Special-theme education
4. Curriculum learning
5. Electronic teaching materials

For remote regions and areas with weak internet connectivity, the China Education Television relayed primary and middle school classes on various lessons. Over 1,000 teachers have participated in recording of online classes broadcasted on TV channels and online.

To support this increase in digital platforms and e-learning, the government enlisted China's three biggest telecoms operators – China Mobile, China Unicom and China Telecom – plus tech companies like Huawei, Baidu and Alibaba to back up the platform with 90 terabytes of bandwidth and 7,000 servers.

Link 1– South China Morning Post
Link 2 – Dept. of Education Australia



Remote Learning

Training customs officers remotely using virtual reality and immersive learning to replicate real-life scenarios

Remote Learning

VR Training

Due to the challenges associated with COVID-19, face-to-face trainings became impossible. As a result, a wide range of e-learning modules, videos and webinars became available to substitute for face-to-face learning. However, companies were facing challenges developing engaging and interesting training material, that not only teaches the users, but is also fun.

To counter this challenge, the Korea Customs Service (KCS) and World Customs Office (WCO) have developed a virtual reality (VR) training course for field inspectors as well as gamified quizzes on goods classification, by simulating real-life scenarios.

Description

As the COVID-19 pandemic took on its effect, the WCO developed a learning platform called CLiCK!. A large selection of courses, learning modules, videos and training material were made available to customs officers around the world. In 2021, the RTC Korea staff started looking at ways to introduce game-based learning on the platform. The idea was to develop the content using Immersive Learning, an experiential training methodology that uses VR to simulate real-world scenarios.

Entity

Customs Cooperation Funds - Korea

Region and location

Asia – South Korea

Core technology

Training program delivered by Virtual Reality and Artificial Intelligence

Remote Learning

VR Training

To develop these scenarios, real customs shipment seizure cases were examined, and related documentation developed, visits were made to a maritime port and warehouse, and accurate software and graphics were designed

The training program works by taking officers to a container yard and warehouse with the mission to carry out inspections on incoming goods. Officers must choose between three scenarios focusing on drugs, IPR infringing items, and explosives, and find the illegal shipments. The program will show necessary steps to wear safety gear, inspect the exterior of the container, scan it with ZBV vehicle and study the X-ray black/white and colored images. Gaming elements include accepting special missions to find items to receive rewards.

The training set-up requires a high memory computer, a TV screen, headsets, hand-held controllers as well as two censors to track the devices. This equipment was first installed at the RTC Korea premises and in November 2021 at the WCO Secretariat in Brussels.

The team is also examining the possibility of developing other content using augmented reality. The difference is virtual reality creates a total immersion simulation, whereas augmented reality superimposes the real world with 3D images, captions and other elements. Augmented reality enables developers to create content of various degrees of difficulty.

The length of one training session is approximately 10 to 15 minutes depending on the trainee‘s progress.

The WCO/RTC Korea team plans to distribute the full set of equipment of the inspection course to all RTCs and to develop the course for PCs and cell phones.

Link 1 - World Custom Organization

Remote Learning

Training customs officers remotely using virtual reality and immersive learning to replicate real-life scenarios

Remote Learning

AR Career Fair

Choosing the right career that one wants to follow in life is an important step. Lack of guidance, financial concerns, fear of failure, are some of the reasons why young adults are confused and panic over this decision. Working with the right guidance counselor, carefully considering what options are available, and utilizing the resources that are available will create a smoother transition to a career choice.

The Department for Education has implemented a unique initiative to help young adults in their career choices by launching an augmented reality (AR) career fair on Snapchat.

Description

Millions of employees are unhappy with their jobs. A 2019 survey revealed that approximately 80 percent of employees no longer felt satisfied with their work. Furthermore, technology also now poses a threat to the job market, as it is moving at a fast pace, and many jobs will be lost permanently. As a student, one wants to pursue a career path that aligns with their values, skills, and ambitions. Students face an overload of questions and suggestions about their career, which not only makes them panic but also confuses them. Due to the pressure from external sources, they may end up selecting a career that is not suited to them.

Entity

Department of Education

Region and location

Europe – United Kingdom

Core technology

Augmented reality through SnapChat app

AR Career Fair

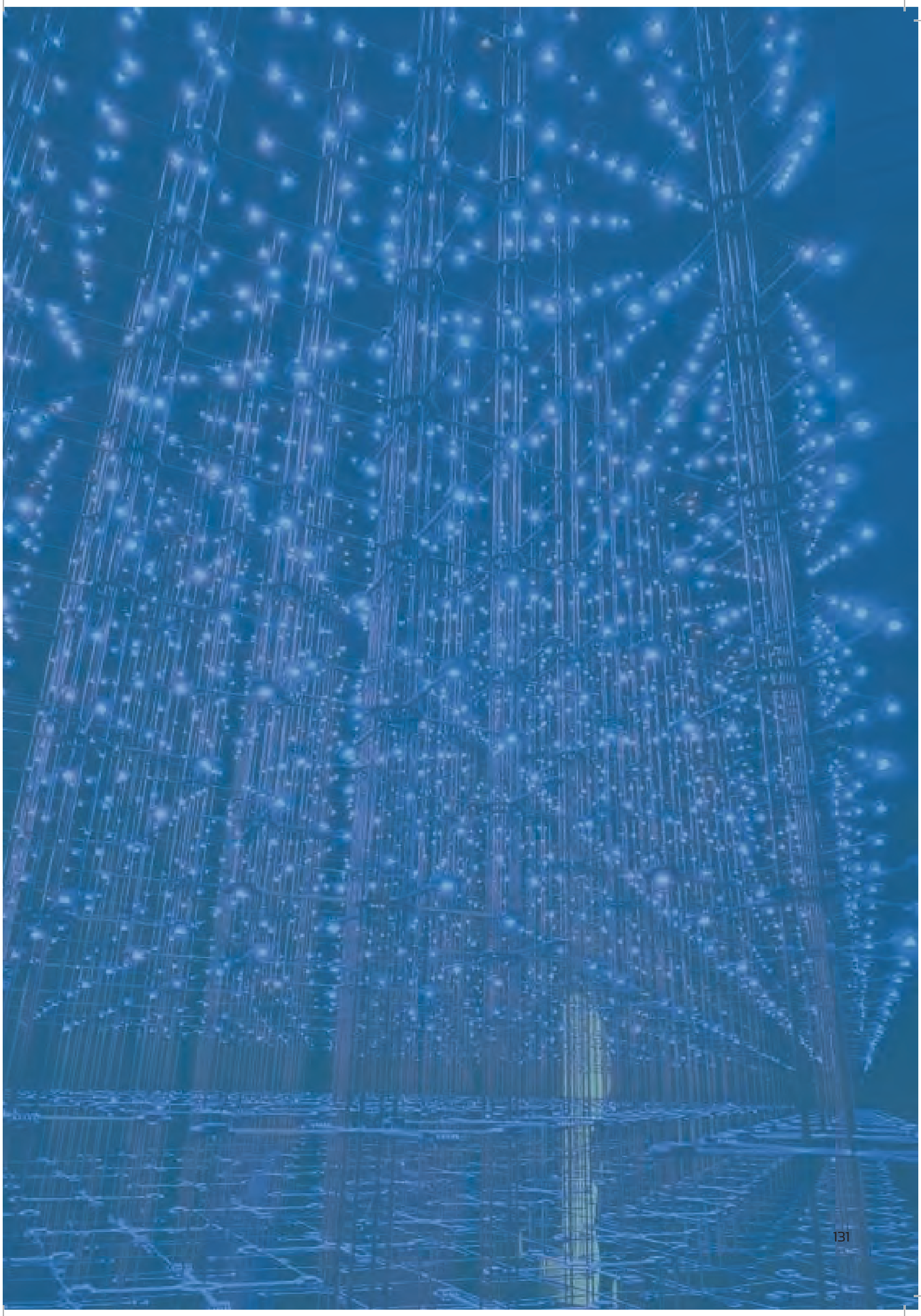
To assist students in making this choice, the Department for Education (DfE) has launched England's first AR Career Fair with Snapchat. The initiative has been devised to help young people understand what their education and training choices are and to help them get the best start to their working lives. The AR initiative is supported by video content that showcases the experiences that young people have had on the different available training and career paths.

The AR career fair has enabled a new and immersive way for young people to understand and engage with the other people their age and discuss career choices, requirements, experiences, etc. Snapchat reaches approximately 90% of 13–24-year-olds in the UK, so this gives a wide range of experiences that people can tap into.

The AR career fair works in the following way:

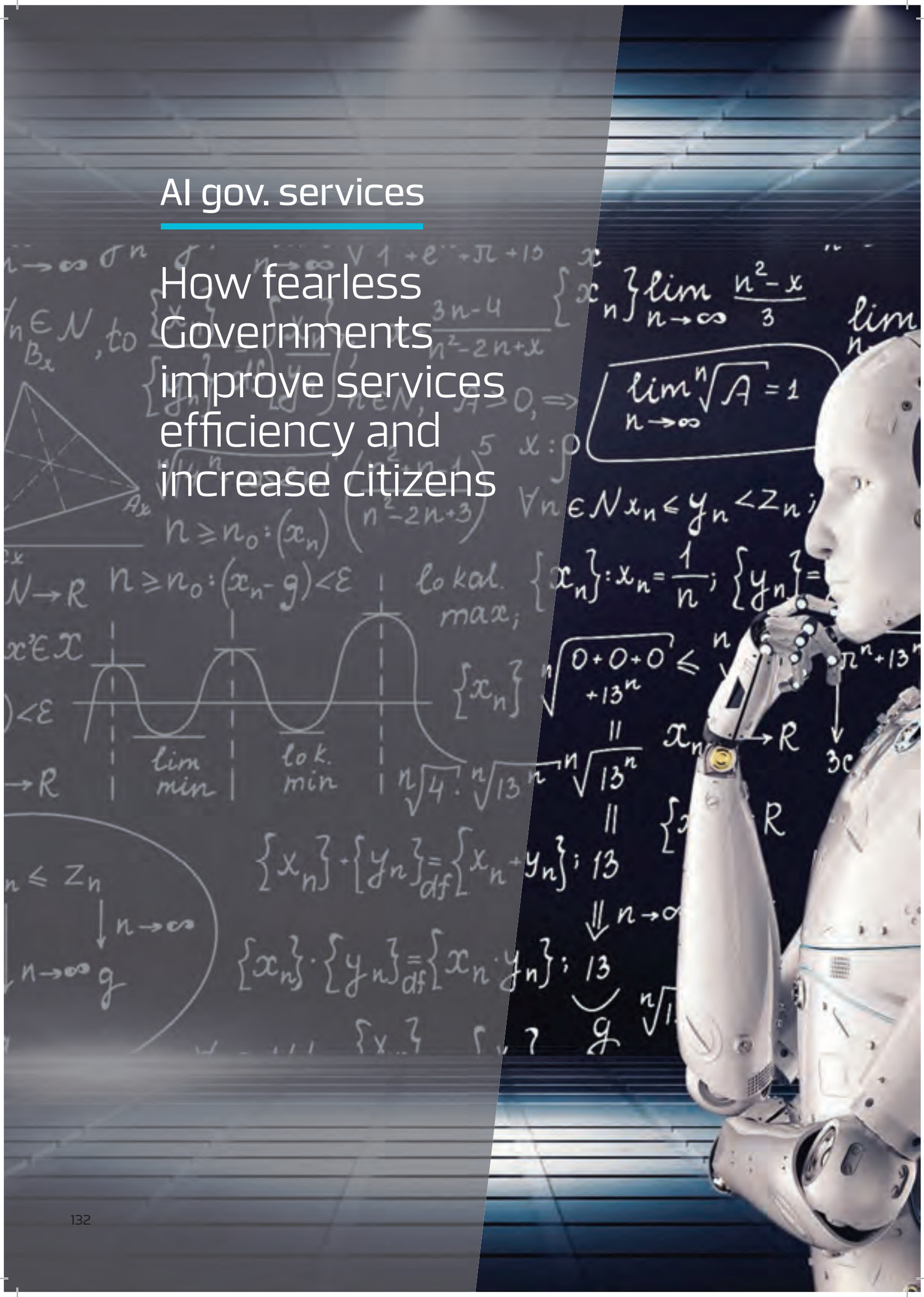
1. Open the Snapchat camera and choose the 'Get the Jump' Skills for Life icon in the carousel (or scan the Snapcode to begin)
2. Once activated, Snapchatters can enter into a virtual career fair where they can hear directly from young people
3. Tap to be taken to the campaign website find out more information about the education and training choices and how to apply

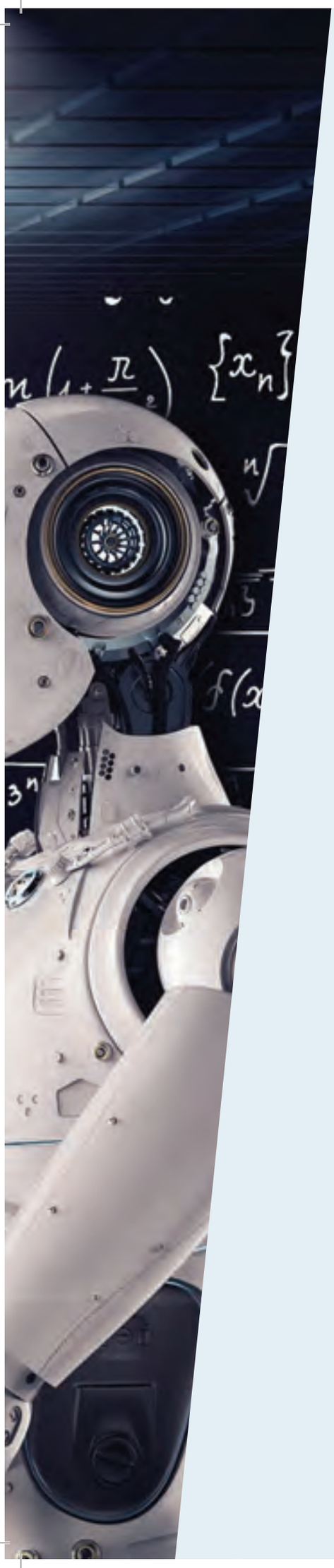
Video - YouTube



AI gov. services

How fearless Governments improve services efficiency and increase citizens





Leveraging Artificial Intelligence potential

The potential of Artificial Intelligence in Government is massive, with use cases spanning from internal efficiency with increase of speed and quality of public services to an improved and personalized engagement with citizens, amplifying satisfaction and trust in the institutions.

Nowadays, Governments worldwide are exploring a vast number of applications with promising outcomes, making it clear that AI has tremendous potential to re-shape government services and cater for the evolving citizen needs.

Using AI powered tools to protect citizens and ensure safer e-commerce shopping experience

AI Powered Government Services

SAFE

The e-commerce landscape has undergone a substantial transformation following the digitalization of life. In 2020, over two billion people purchased goods online, and e-retail sales surpassed $4.2 trillion worldwide. COVID-19 has had significant impact on the e-commerce space with demand being exceptionally high for everyday items such as groceries, clothing, but also retail tech items.

E-commerce risks include faulty and illegal products being sold. Using AI SAFE aims to target such scams and products and alert the authorities and make the shopping experience safer for customers.

Description

The internet is full of dangerous products, be it faulty tech and electrical products or dangerous and unsafe outdoor equipment, and as a consumer, it can be difficult to identify these at home behind the screen on e-commerce websites.

As recently as 2020, the process of identifying dangerous products was conducted manually by individual countries, which was not only time consuming but also very costly. As a result, The Danish Safety Technology Authority developed SAFE, an artificial intelligence (AI) based tool, to automatically search the internet for dangerous products with a fine-toothed comb.

Entity

Danish Safety Technology Authority, Danish Ministry for Industry, Business and Financial Affairs

Region and location

Europe - Denmark

Core technology

Artificial Intelligence and Big Data

SAFE

Using relevant searches and images uploaded in EU databases for dangerous or deficient products, SAFE scans the Internet for identical sentences, words and images of products and similar types of patterns. SAFE uses input from Safety Gate, the European rapid alert system for dangerous products (RAPEX), and the Information and Communication System on Market Surveillance (ICSMS) to generate a list of relevant results, which participating authorities can access through their interfaces to SAFE. If a suspected item is found, the tool sends a message to the authorities, after which the authorities can take steps to prevent the sale of the specific item by blocking the website and sanctioning the company behind the product.

The tool was successfully used in the case of personal protective equipment, where the Danish Safety Technology Authority has already used the program to find specific products 74 times and prevent customers from purchasing faulty items.

Overall, the success of SAFE is determined by identifying faulty and dangerous products and preventing these circulating in the market to ensure safe shopping experiences for customers. SAFE also uses customer feedback to improve the tool and add products that may have been missed in the initial search.

Link 1 – Danish Safety Technology Authority
Link 2 – KDM Web Site


Delete
Shop

Using AI powered tools to protect citizens and ensure safer e-commerce shopping experience

AI Powered Government Services

TEXTA

Of the many technologies with the potential to deliver significant value in the near future, Artificial Intelligence (AI) seems firmly planted at the top of the list. IT experts widely agree that AI will drive the majority of innovation across almost every industry sector in the next one to five years.

The TEXTA toolkit, an AI based to support the Estonian Government performing complex text elaboration tasks such as customer support automation, information extraction, DMS audit, document recommendation, detect text from images, document classification, sentiment analysis and data visualization.

Description

The use of open source is one of the goals of the Estonian National Action Plan to take digital government to the next level. In 2019, Estonia launched a government repository platform, the koodivaramu.eesti.ee, where open-source software solutions developed for the government are made public and freely accessible. The long-term goal of the platform is to build community-based solutions for public administrations and the code repository will be a cornerstone of that project.

Entity

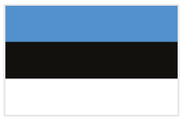
Ministry of Finance, Ministry of Economic Affairs & Communications

Region and location

Europe - Estonia

Core technology

Artificial Intelligence (text recognition), Data Analysis



TEXTA

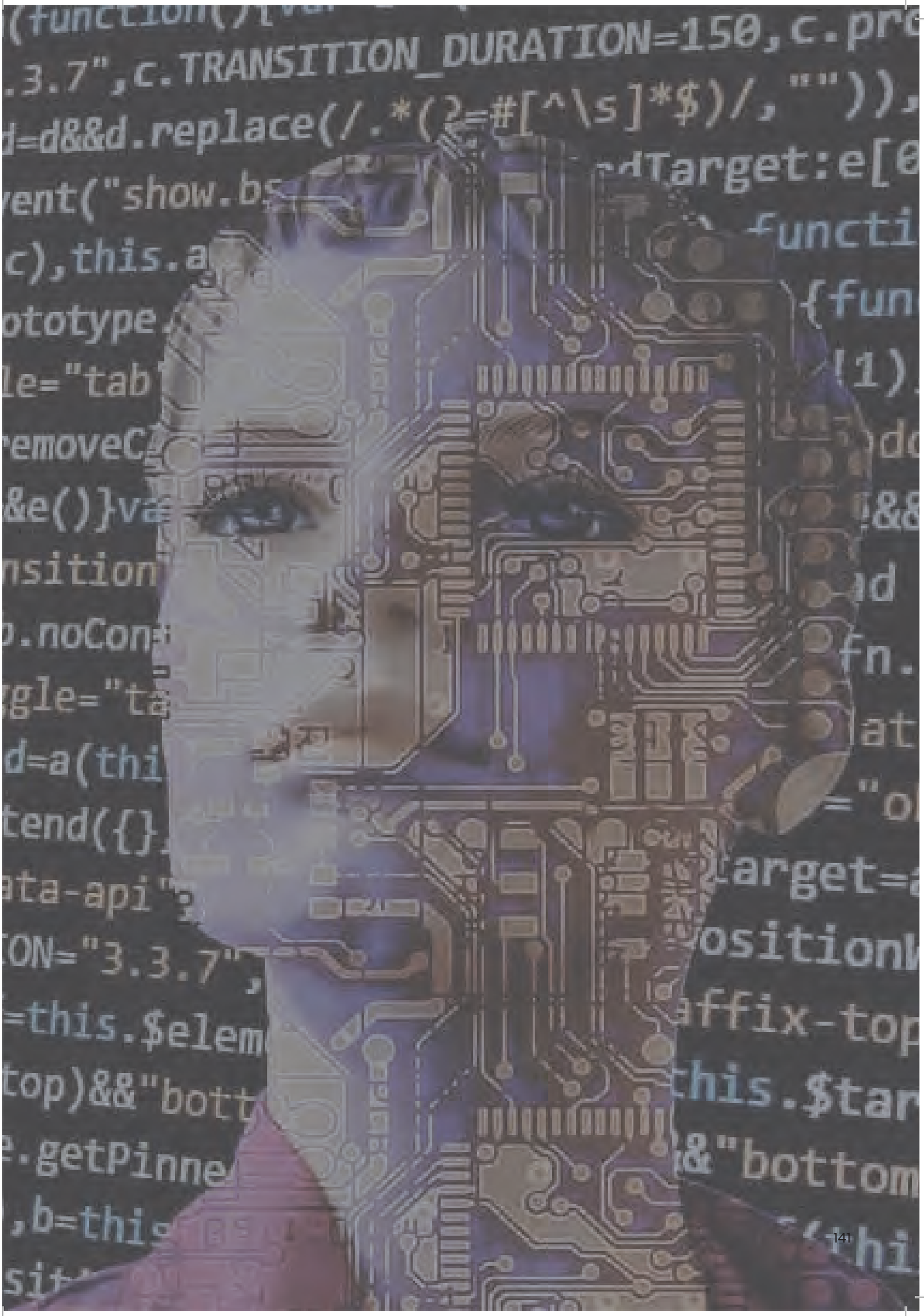
The government is aiming to make available base components of AI-based standard applications in order to speed up the implementation and uptake of AI-based solutions within the public and private sectors.
One such AI-based standard application is The Terminology Extraction and Text Analytics (TEXTA) toolkit.
The TEXTA toolkit is a set of tools that enables users to perform text analytics tasks. The toolkit enables users to analyze data collected from complex free-text datasets. Its main components are a searcher application, a classification tool, a data extractor and a terminology analysis tool.

The Estonian government has used the TEXTA toolkit successfully over the last two years. The Ministry of Education and Research used the software to audit its document management system. The software was analyzed more than 800,000 documents in order to determine which were not suitable to be publicly accessible. The judicial system used the toolkit to process the numerous documents of the registry of judicial decisions and identify the results of the lawsuits.

Some of the examples where the TEXTA toolkit has been implemented include:

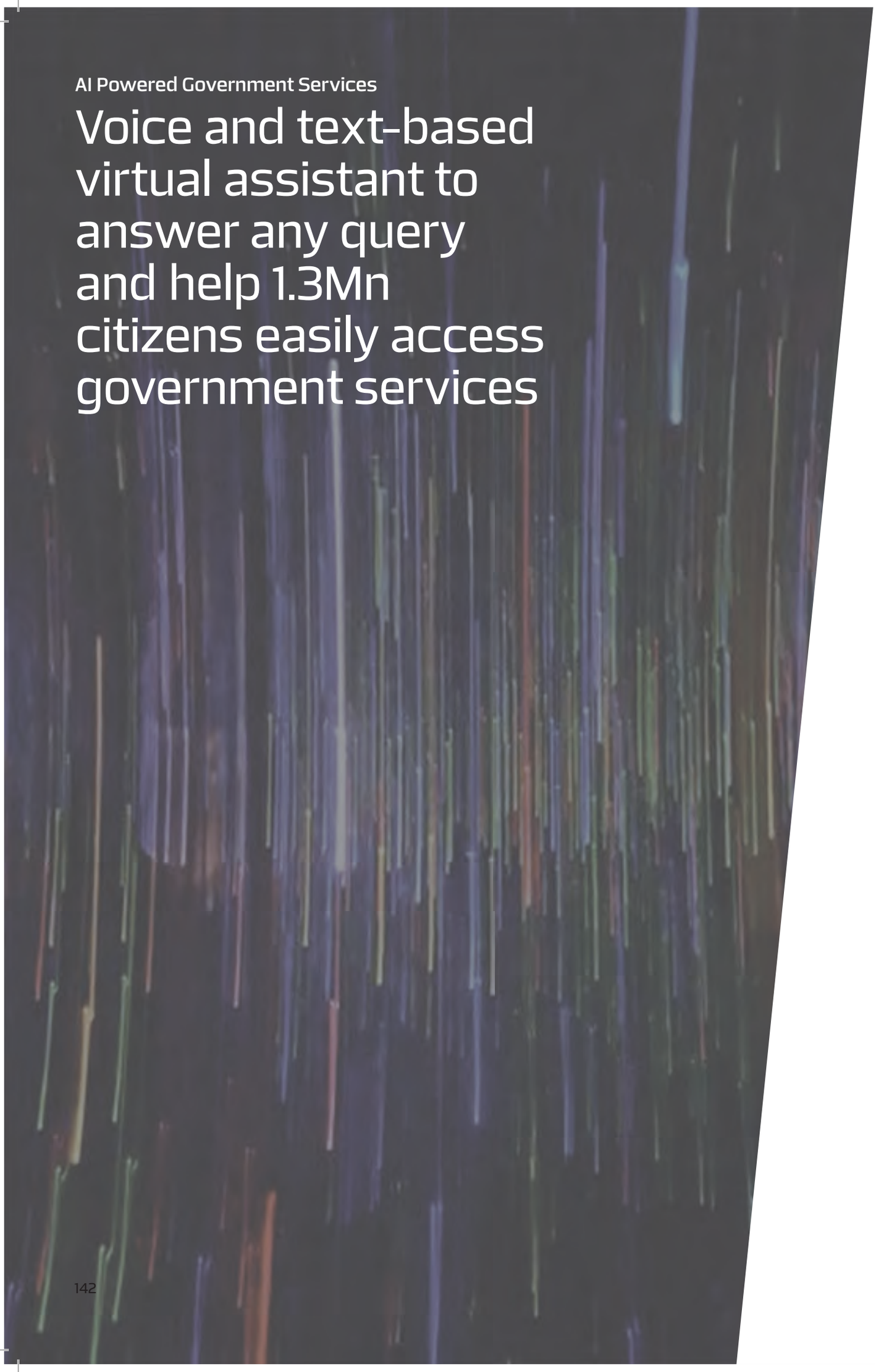
- Customer support automation
- Information extraction
- DMS audit
- Document recommendation
- Detect text from images
- Document classification
- Sentiment analysis
- Data visualization

Link 1 – Texta Web Site



AI Powered Government Services

Voice and text-based virtual assistant to answer any query and help 1.3Mn citizens easily access government services



AI Powered Government Services

Bürokratt

In the past few decades, the accelerating digitization has revolutionized our lives and how we perform our daily activities. This is rapidly being reflected in how governments offer their services and engage their citizens. Bold governments are racing to offer e-services with aim of improving both quality and cost.

The Estonian government is in the process of rolling out a unique approach to e-services, with a new artificial intelligence (AI) guided platform that will completely change the way that people interact with the government and use public services.

Description

The World Bank defines e-government as the use of information technology by government agencies who are responsible for transmitting information between people, businesses, and governmental stakeholders. The e-government has a wide range of objectives including better delivery of public services to people, enhancing business and industry collaborations, citizen empowerment through access to information, or more effective governance.

Entity

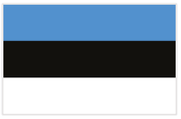
Ministry of Economic Affairs and Communications

Region and location

Europe - Estonia

Core technology

Artificial intelligence, voice and text-based virtual assistant



AI Powered Government Services

Bürokratt

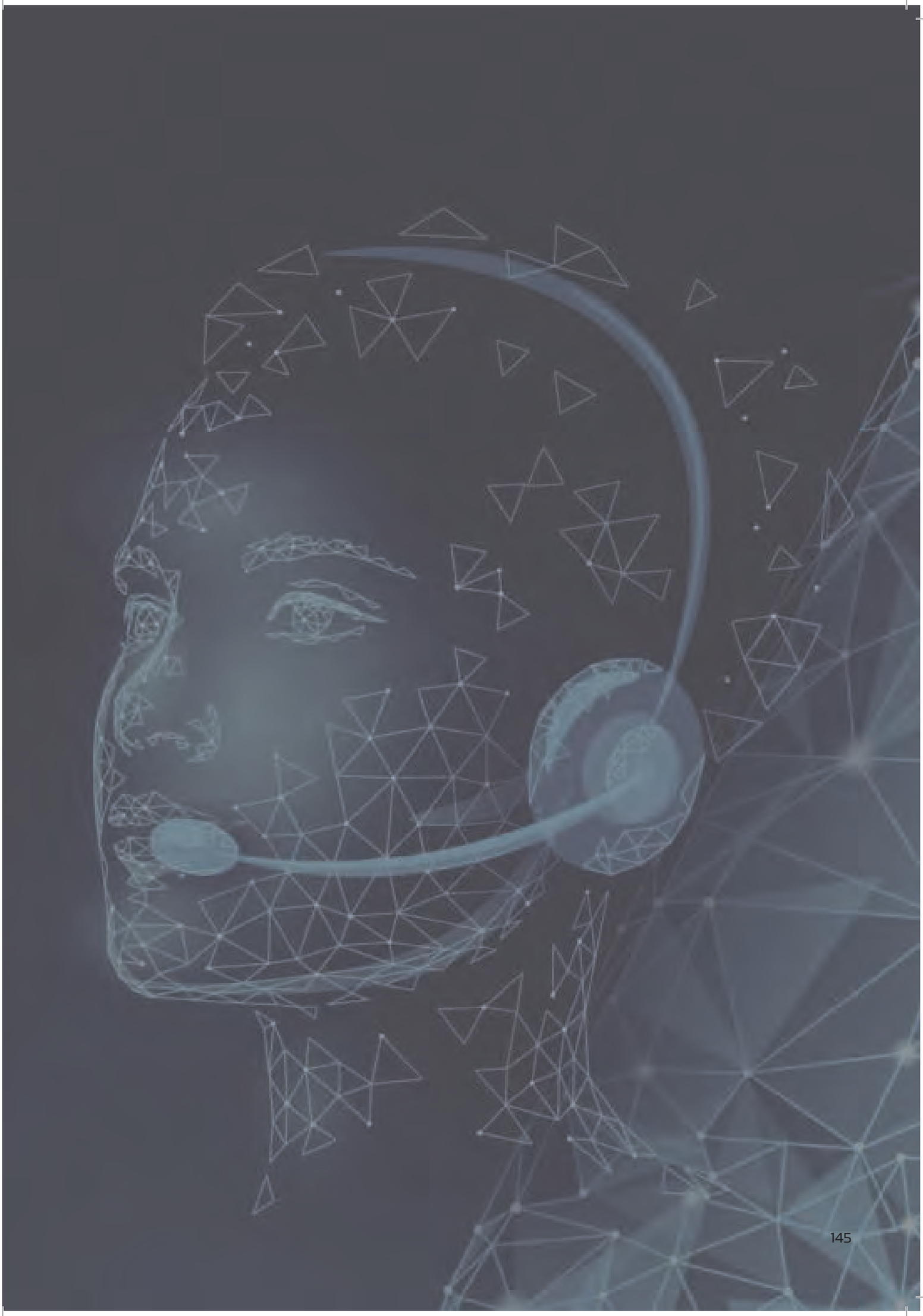
Estonia's Ministry of Economic Affairs and Communications has taken a bold leap on e-government and what it means to serve their citizens. Bürokratt, the world's first public service AI-based virtual assistant, brings together a network of AI applications, and will enable citizens to use public services with virtual assistants through voice-based recognition.
Citizens will be able to access all public services with Bürokratt, allowing them to apply for family benefits, file taxes, renew a passport and in the future even apply for a bank loan. Bürokratt will also have a feature that reminds citizens ahead of time when upcoming actions are required, and will be personalized based on a user's data, and not simply a repetition of public information based on user questions, as most virtual assistants currently operate.

The long-term aim is to train Bürokratt and develop its basic functionality to the point that most public services and voice-based communication are available through it. It will also be developed to interact with other platforms, such as Facebook Messenger, for communication between the state and the consumer.
While the most visible element of Bürokratt is its virtual assistant or chatbot, Bürokratt encompasses more than just that tool. It is a series of connected networks of AI applications accessible via voice. Bürokratt aims to provide a platform where AI and other services, public and private, will be able to combine and interact.

Government AI agents, bots, and assistants, as well as private sector ones, will serve the user via a united channel, enabling them access to a spectrum of services.

Bürokratt was named on UNESCO's list of the top 100 best artificial intelligence projects in the world.

Video - YouTube



Defeating misinformation and fake news related to COVID-19 through Artificial Intelligence based tools

AI Powered Government Services

MYGOV SAATHI

In the digital age, information spreads fast but misinformation spreads like wildfire. It is extremely challenging to differentiate between what is accurate and what is not. The rapid transmission of fake news has become so prevalent that it's taken on proportions of a pandemic – an information pandemic – or "infodemic".

AI has emerged as a powerful tool to fight the ever-growing menace of 'infodemic' by detecting fake news and videos and disseminating correct information through chatbots.

Entity

Digital India Corporation (MyGov)

Region and location

Asia – India

Core technology

Artificial Intelligence (chatbots, virtual agents), Data Analysis

Description

By the end of May 2020, more than 150,000 Indian people tested positive for COVID-19. As a result, the country's leaders not only wanted to curb the rising numbers of COVID-19 cases but also wanted to address misinformation. The government needed a dynamic tool that could provide regular information to the public, and also combat the misinformation spread around easily. They developed several tools for this task, two if which are "MyGov Saathi" and the "COVID-19 WhatsApp Support Counter".

AI Powered Government Services

MYGOV SAATHI

MyGov Saathi is an AI powered tool aimed to provide the Indian population with a reliable source that provides factual and helpful guidance on COVID-19 and better prepare the citizens for the crisis and empower them to reduce their risk of contracting the virus.

The persona-based chatbot was programed to provide customized answers for queries relevant to the user's background, based on the most recent data. For instance, the chatbot could provide information specific to farmers, migrants, senior citizens, frontline workers, etc. so they all adopt behaviors that minimize transmission and exposure to the coronavirus. The tool can provide users with facts, figures, government information, professional and medical advice, and alerts on fake information. MyGov Saathi can handle up to 300,000 users per day and 20,000 concurrent users per minute.

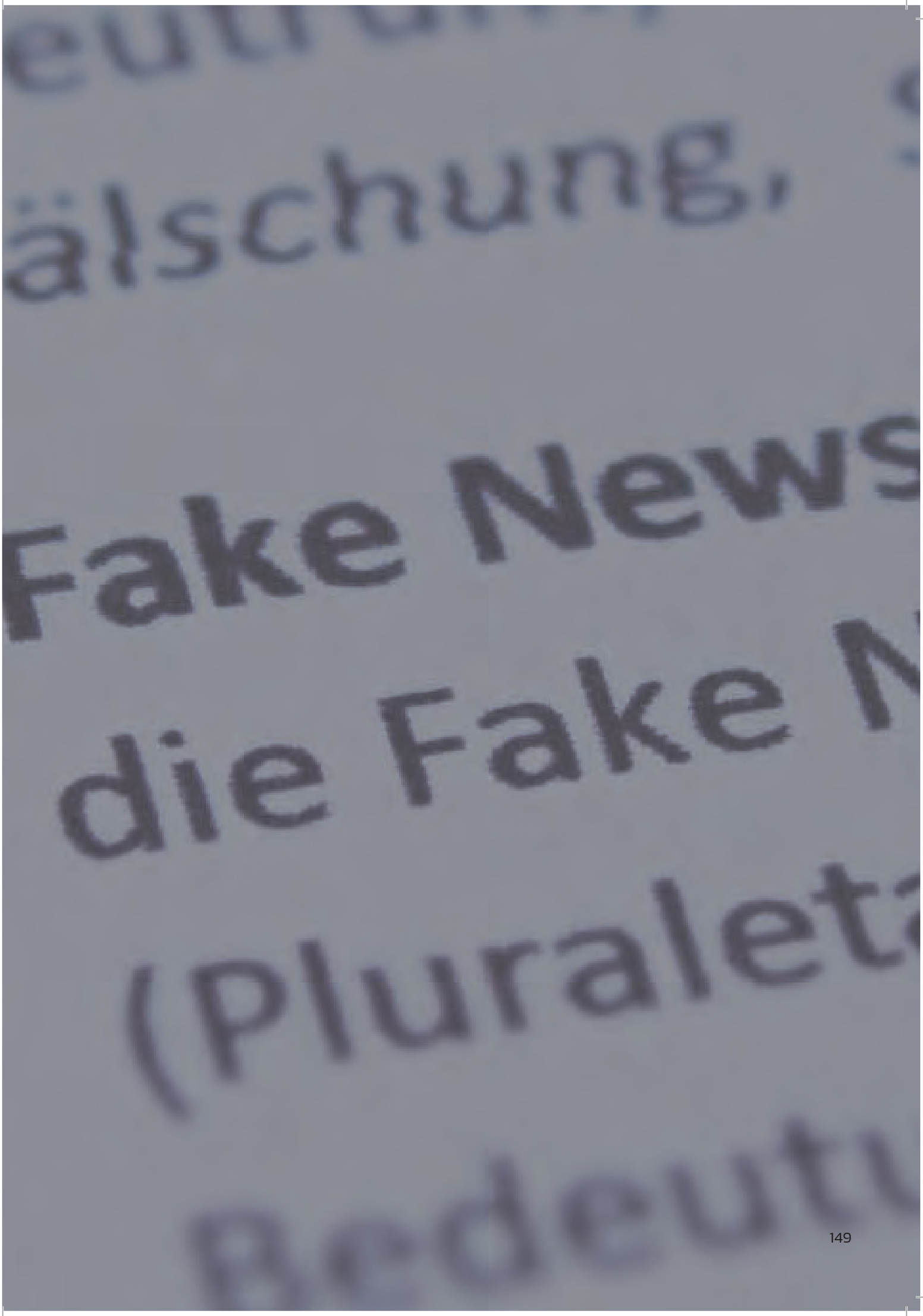
As the pandemic grew, so did misinformation on the number of cases, prevention techniques, and health tips. The Indian government deployed the world's largest WhatsApp chatbot – MyGov Corona Helpdesk – in record time to aid the fight against the pandemic by disseminating timely and right information and offer a 24/7 helpdesk that answered coronavirus queries and helped prevent the spread of false information.

The chatbot was has the following features:

- Help users check symptoms and get a diagnosis
- Provide tips and precautionary measures to stay safe
- Share the latest updates and advisories from the Ministry of Health
- Bust myths around COVID-19
  Share information about the official helpline

Since its launch in March 2020, the helpdesk has successfully catered to over 25 million users with over 36 million queries. Remarkably, the chatbot was deployed in a record time of only five days.

Video - YouTube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AI Powered Government Services

90% improvement in short-term weather predictions using innovative Artificial Intelligence solutions helping emergency services provide rescue

AI Powered Government Services

DEEPMIND

Near-term weather forecasting — in this case, accurately predicting local rainfall and snow in a specific location within a two-hour window — is an important challenge. Accurate predictions, particularly of intense rainfall, can save lives from flooding and other storm damage. It can also help emergency services and energy companies decide where to deploy first responders and repair crews to speed rescue and recovery efforts during natural disasters.

DeepMind, in partnership with the British government's meteorological service to use A.I. to significantly improve short-term rain forecasts.

Description

Making these short-range forecasts, which meteorologists sometimes refer to as "nowcasting," has long been a challenge in meteorology and it is one that weather forecasters say is becoming more difficult as climate change makes intense local rainfall both more frequent and difficult to predict using standard weather models.

Those traditional models are based on a series of physics equations that try to essentially simulate what is happening in the atmosphere. But the complexity of the equations makes it difficult to continually update the forecasts to take into account new information.

Entity

British Meteorological Service

Region and location

Europe – United Kingdom

Core technology

Artificial Intelligence

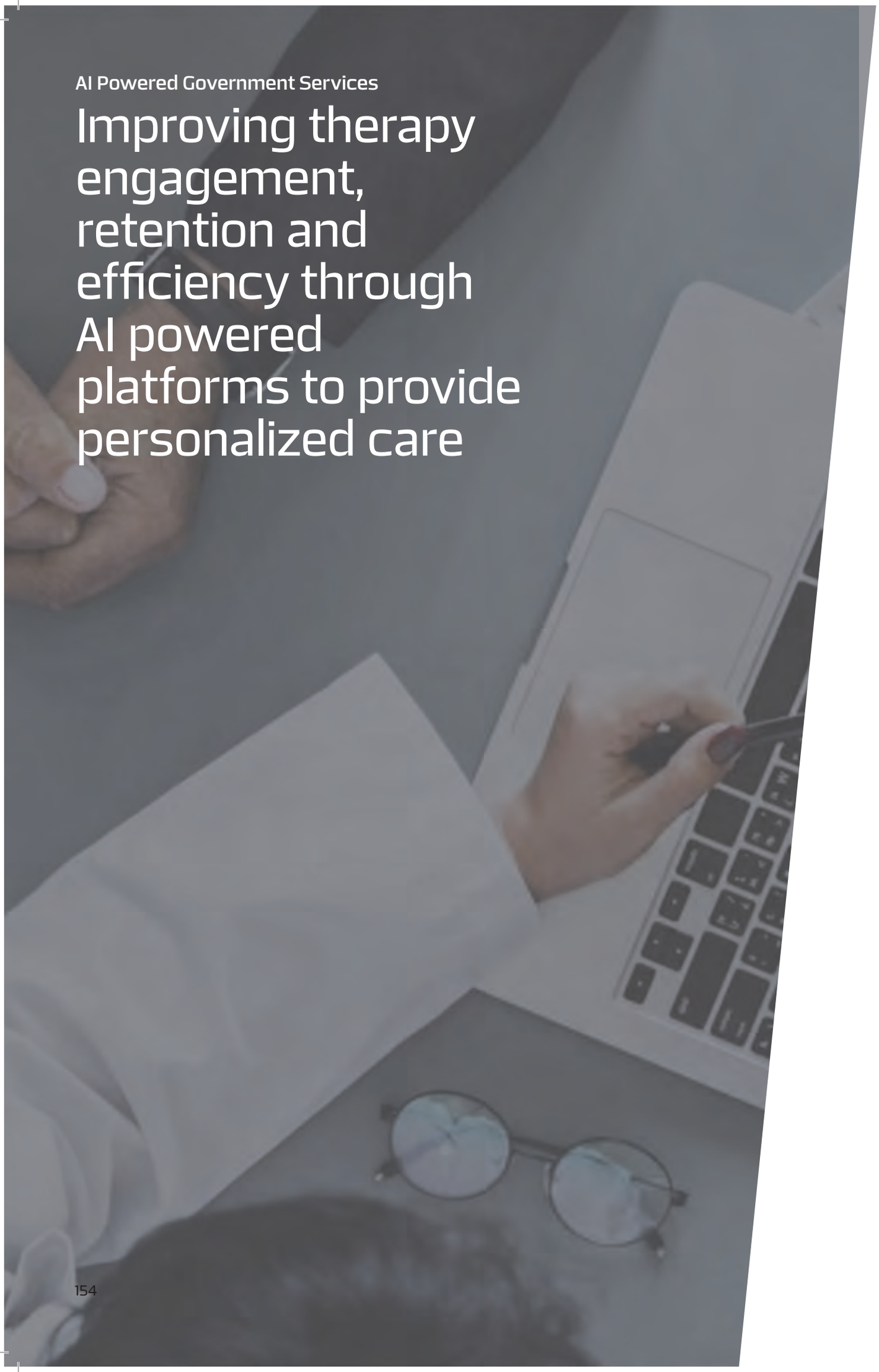
DEEPMIND

In many places around the globe, including the U.K., powerful weather radar can detect precipitation at ground level at a resolution of one square kilometer every five minutes. DeepMind's scientists decided to create an A.I. system, based on neural networks, a kind of machine learning loosely based on the human brain, that takes in the radar images from the recent past and then generates a series of projections of what the radar image will look like in the future. The system looks only at the radar image and does not take into account the atmospheric conditions, such as humidity, barometric pressure, temperature and wind speed. The system was trained on three years of historical U.K. weather radar data, looking at this data over a 20-minute period and then trying to predict precipitation over the following 90 minutes.

The company's scientists said that the Met Office meteorologists preferred its A.I.-generated forecasts to not only the physics-based ones, but also another kind of A.I.-based weather prediction system in which the software is also trained from historical data. But this other A.I. method cannot produce the detailed, fine-grained images that DeepMind's software does.

Video - YouTube

Improving therapy engagement, retention and efficiency through AI powered platforms to provide personalized care



AI Powered Government Services

LIMBIC

Even before the COVID-19 pandemic, mental health services were already massively overburdened, which leads to long wait times, lower clinical outcomes, and poor service user satisfaction scores. A recent study showed that 34% of adults in the UK showed anxiety or depression symptoms in 2020, up from 19% in 2019.

AI has been used in the mental health space to offer additional support to patients, but Limbic have launched an innovative package that goes beyond just mental support.

Description

The Centre for Mental Health estimates that 8.5 million adults in the UK will need mental health support as a direct result of the pandemic. However, there have been growing concerns about the number of mental health staff available to deliver these vital services. Currently, there are over 1.1 million patients in talk therapy, with just over 30,000 psychologists available to treat them.

Existing digital solutions are inflexible and lack the relevant skills of a human therapist, which ultimately leads to low engagement rates.

Entity

British Meteorological Service

Region and location

Europe – United Kingdom

Core technology

Artificial Intelligence

LIMBIC

To address this, Limbic have developed an AI-enabled app tool for patients and clinicians throughout the care journey. The app provides relevant support, encouragement, and personalized treatments to help "bridge the gap" between the increase in patients and the number of available clinicians.

Using conversational AI and Cognitive Behavioral Therapy (CBT) methods, the app supports patients throughout the entire care journey, from waitlist through to discharge.

The care journey is based on three forms of services:

1. Limbic Self-care: Patients access this platform when they are waiting for their therapy sessions to begin (currently, people wait over 1 year to see a therapist, due to high demand). The app acts as a "companion" for this phase and gets to know the patient in detail by asking them how they are feeling, helping them keep track of their thoughts, etc.
2. Limbic Care: This feature is activated once the patient begins seeing the psychologist in person. Details from the self-care phase are recorded and provided to the psychologist, which means the sessions can target specific needs from the beginning. The psychologist records summaries of the sessions on the app and the app uses these to provide personalized tips to the patient in between sessions.
3. Limbic Sustain: This feature is activated once the patient has completed his therapy sessions and is designed to reduce the chance of relapse. The app continues to be a "companion" and provides personalized coping strategies, a ready-made relapse prevention toolkit and guides the patient during the transition out of care

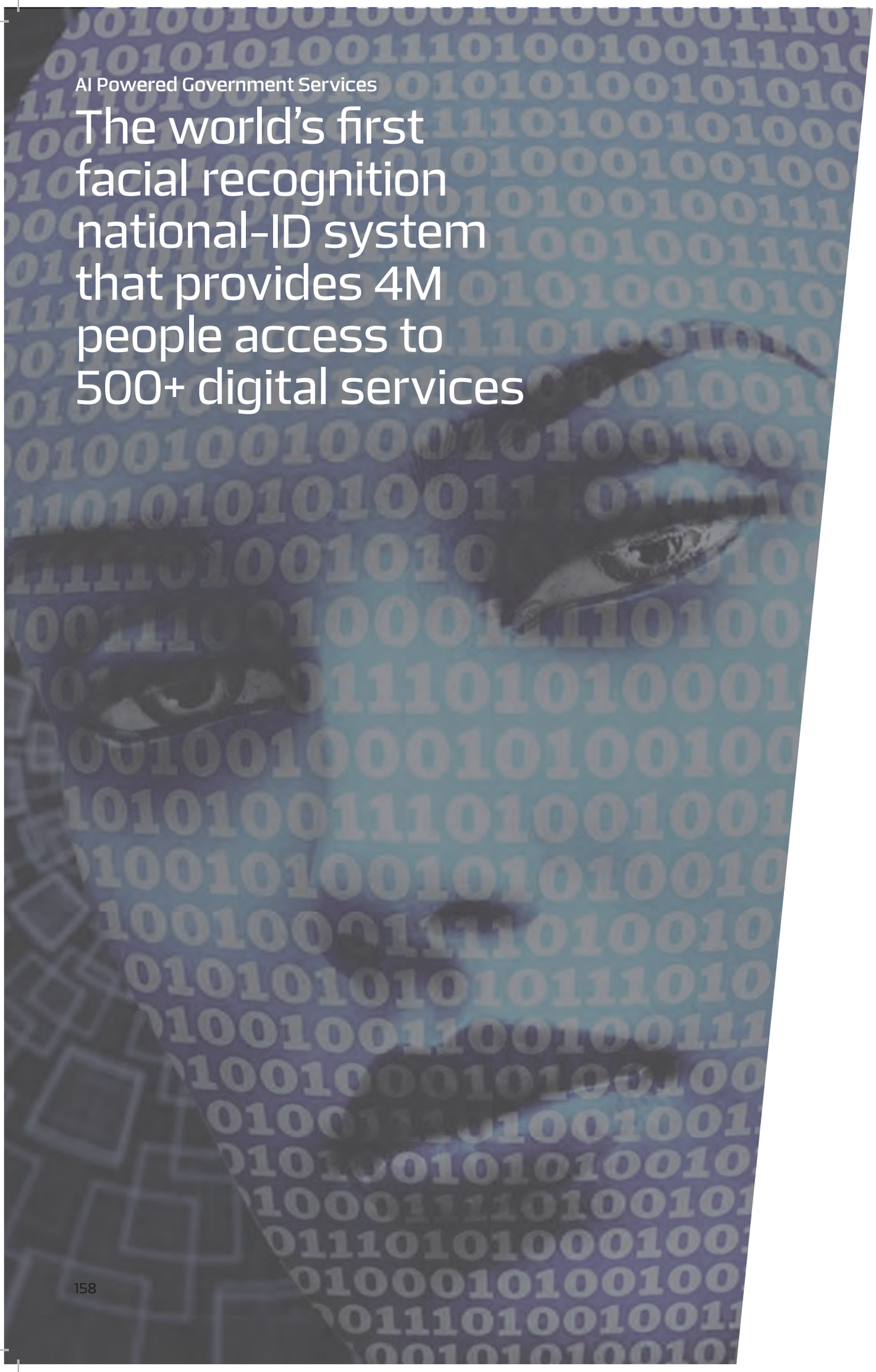
Limbic has been able to reduce the assessment time significantly. Patients would undergo 60-minute assessments to determine their symptoms. However, with Limbic, this assessment time has been reduced to 20 minutes. In addition, automating these early steps will free up over 7,300 hours per year of the therapists' time.

Video - YouTube


How do you feel?
Very bad
Good
Bad
Moderate

AI Powered Government Services

The world's first facial recognition national-ID system that provides 4M people access to 500+ digital services



AI Powered Government Services

SINGPASS

While face recognition has been around in one form or another since the 1960s, recent technological developments have led to a wide use of this technology. Millions of people now have face recognition technology in the palms of their hands with the latest cell phones having these features in-built.

SingPass, the National Digital Identity (NDI) initiative, provides a convenient and secure platform for citizens and businesses to transact with the Government and other private service providers, while protecting their data and personal information using facial recognition software.

Description

SingPass is every Singapore resident's digital identity. It has evolved into a gateway allowing convenient and secure access to over 500 digital services offered by more than 180 government agencies and commercial entities.

Launched in 2003, SingPass is a personal authentication system that allows users to access various government services online. Users can log in to digital services conveniently and securely through the Singpass app using their fingerprint, facial recognition or a 6-digit passcode.

Entity

Government Technology Agency of Singapore

Region and location

Asia – Singapore

Core technology

Artificial Intelligence (facial recognition), Biometric authentication

AI Powered Government Services

SINGPASS

In 2020, SingPass added the facial recognition feature on their app. The system automatically enables four million Singpass users to authenticate themselves when accessing online government services on computers or at kiosks.

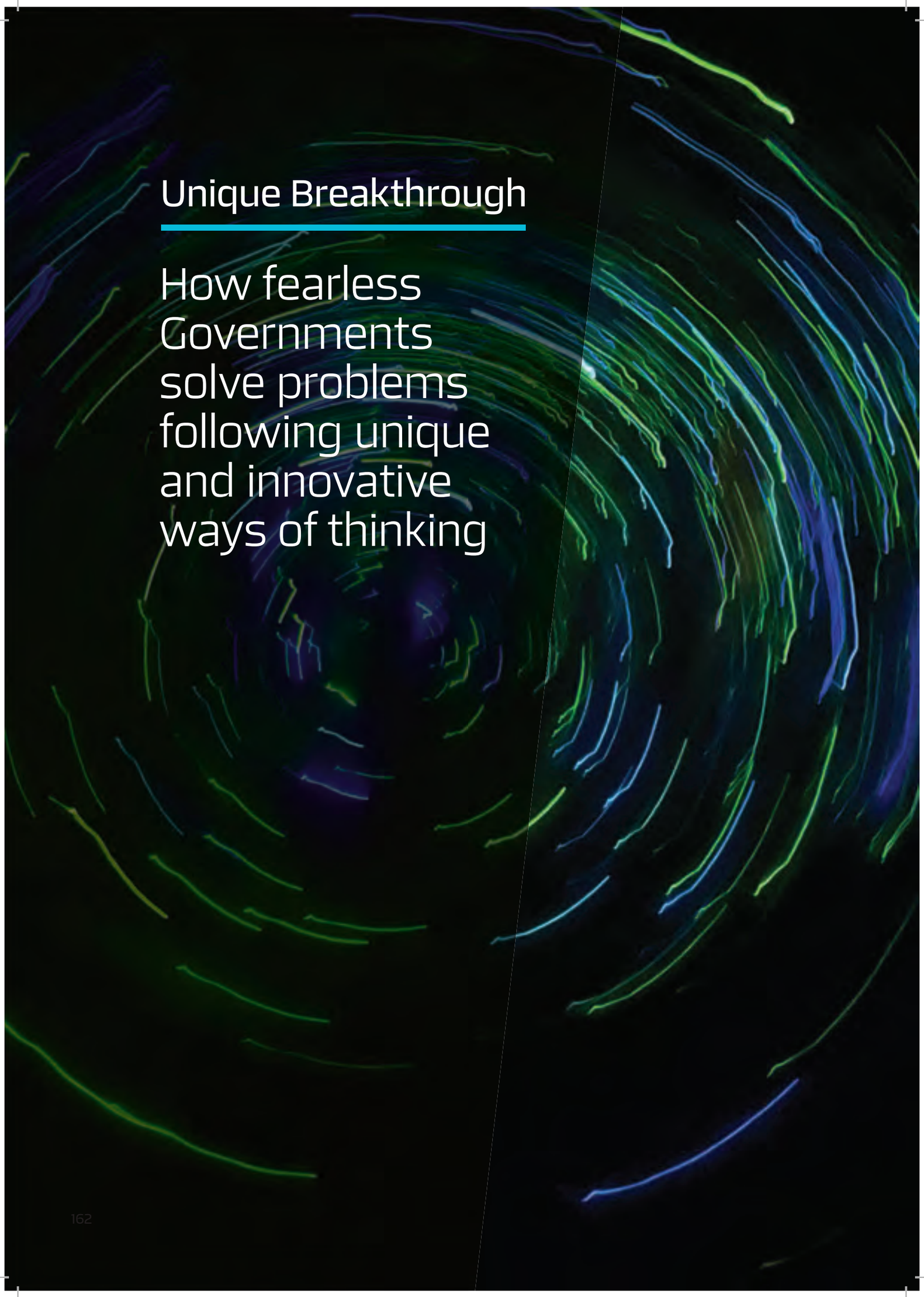
Activities such as completing a tax return can now be completed with a simple facial biometric scan, replacing the need to remember passwords. The added feature on SingPass made it the first system that uses cloud facial verification to secure national digital identity.

Unlike facial recognition, which matches a physical face to a list of images on a database, SingPass uses facial verification, which is done with interaction from the user. The camera on the mobile device, computer or kiosk illuminates the user's face with a cryptographic sequence of colors for a few seconds. This confirms that a user is the rightful holder of their national identity number, a real person, and authenticating in real-time.

The cutting-edge solution of facial biometric authentication will replace a device-based security solution, which uses SMS one-time passcodes. The new approach provides a secure, cloud-based solution that benefits citizens, businesses and government agencies in Singapore.

Video - YouTube


SingPass
SingPass Mobile
Say goodbye
to passwords
& tokens!



Unique Breakthrough

How fearless Governments solve problems following unique and innovative ways of thinking

Smart application of emerging technologies to overcome issues

The adoption of innovation by Government entities is increasingly focused on smart ways to resolve problems while exploring original and untraveled paths.

Bold Governments are embracing emerging technologies in a creative way, defining new approaches and innovative ways of thinking to find better and sharper solutions.

This report encompasses both the desired end-state and the unique journey that Government entities chose to follow to achieve better results.

Unique Breakthrough

Availing water and basic necessities to millions of the ‘poorest’ most deprived citizens through leveraging smart non-invasive LIDAR mapping technologies

Unique Breakthrough

Favelas4D

Some of the world's largest informal settlements are found in Brazil, where the lack of infrastructure gives rise to improvised and jerry-rigged plumbing and electrical wiring. Buildings are densely and turbulently arranged in a manner that defies traditional identification systems like street names and numbers.

Illegal and unplanned settlements will grow in cities everywhere as urbanization accelerates. Digital technology can help residents connect to services they need.

Entity

Head of International Relations

Region and location

South America – Brazil

Core technology

LIDAR, Fiber Optics

Description

Rocinha is one of the largest among hundreds of unplanned settlements (called favelas) that have sprung up on the outskirts of Brazilian cities since the 19th century. More than 5% of the country's population now lives in communities like these, with 100,000 people in Rocinha alone.

Conditions in favelas can be extreme. With little formal aid and administration, residents must contend with unhealthy living conditions and frequent violence.

Unique Breakthrough

Favelas4D

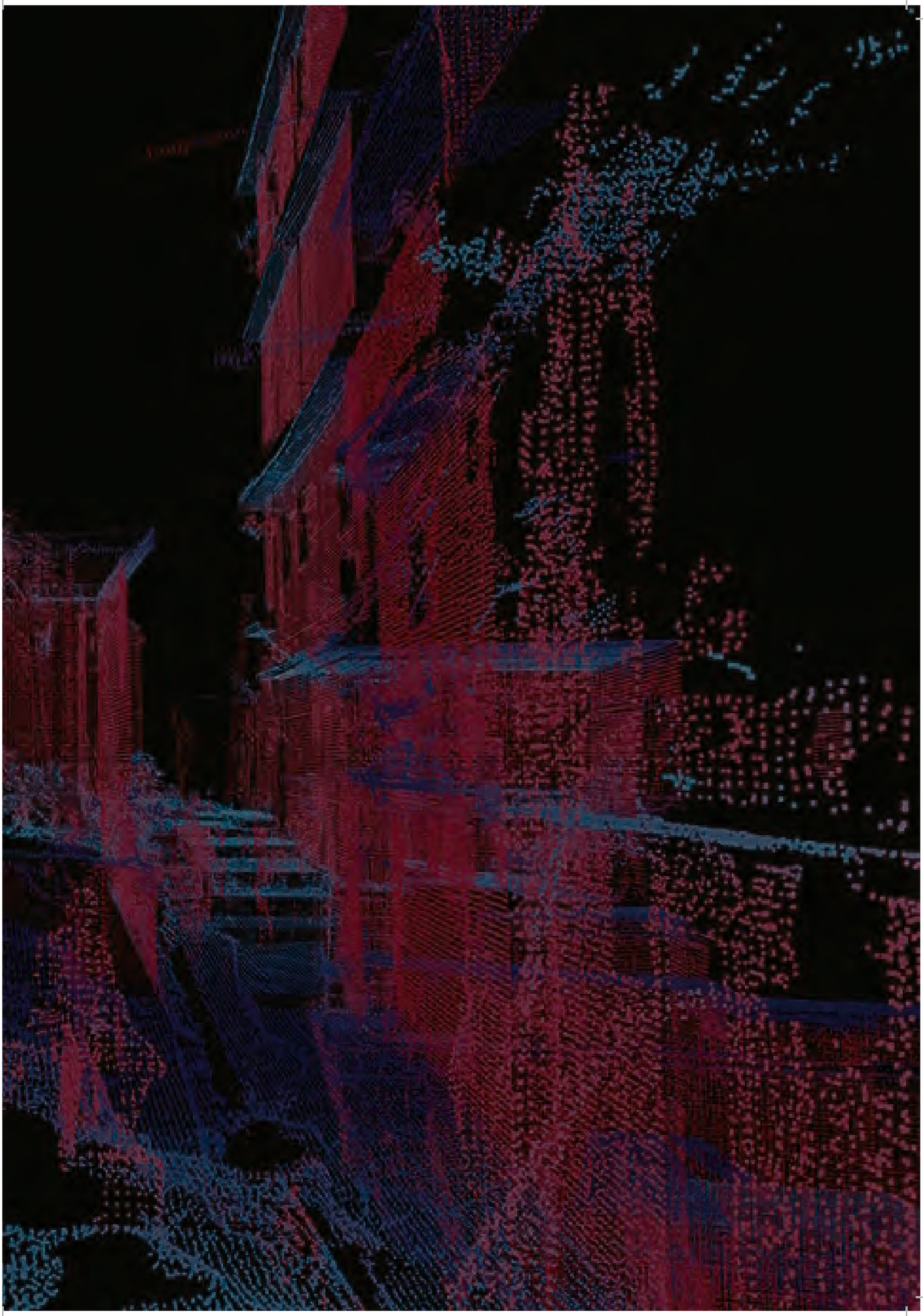
Necessities like electricity and water are difficult to organize due to the twisting and turning infrastructure that these must navigate. The city of Rio, together with MIT's Senseable City Lab are working together to digitally map the entire of Rocinha. An accurate map of the area will enable the city to provide water and electricity more easily, implement measures to improve living conditions, and create official property records that could lead to residents owning their properties in future.

Hand-held 3D scanners are used to collect data points from every narrow alley and building in the favela, with over 300,000 data points captures per second. These points are mapped to locations in space to create a dataset that reveals the intricate details of a 3D environment.

Five factors were used in the data collection and analysis to map Rocinha: street width, street elevation, the density of facades, variance in facade height and street canyon (the ratio of facade height to street width).

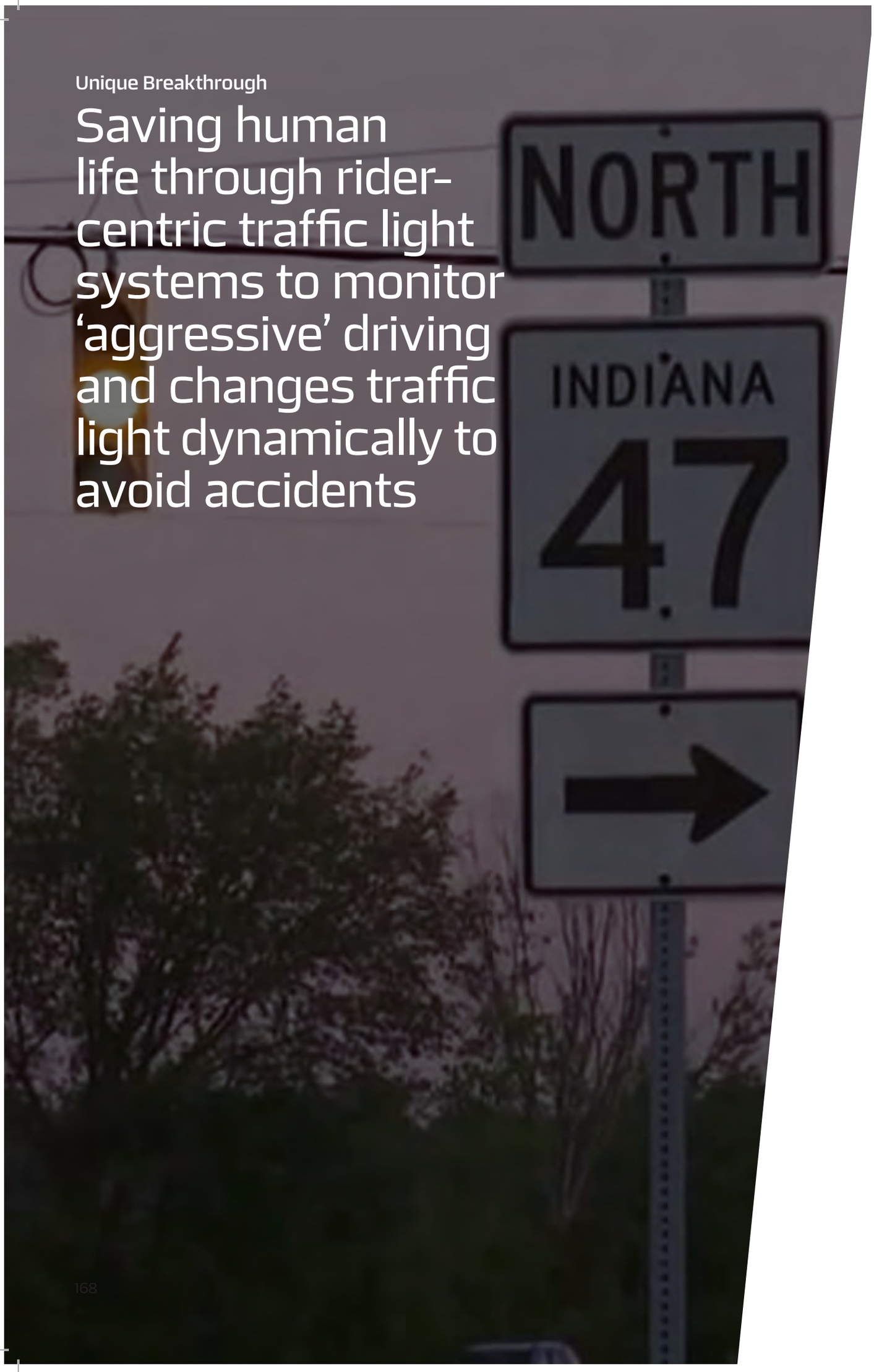
Compared to other open-source mapping devices such as Google Street View, the LiDAR method is more accurate and flexible, as these hand-held devices can be taken into marrow spaces and tall buildings.

Video - YouTube



Unique Breakthrough

Saving human life through rider-centric traffic light systems to monitor ‘aggressive’ driving and changes traffic light dynamically to avoid accidents



Unique Breakthrough

Human-Safety Traffic

To reduce speed-related casualties related to vehicles running red lights, researchers have developed technology to dynamically extend the duration of traffic lights. According to the Federal Highway Administration, traffic signals are prime locations for accidents, with more than 2 million crashes and 3,000 fatalities a year.

The technology collect data from wireless transmitters calculate the speed and trajectory of oncoming vehicles and communicate that information to the signal, which uses embedded intelligence to adjust the time the light stays green or to change to a yellow light earlier than necessary.

Description

Because the technology is built on the wireless transmission of data rather than sensors embedded in the roadway, the solution requires much less infrastructure investment. The technology has been initially designed for large vehicles and semi-trailers that need more stopping distance and are therefore twice as likely to run a red light.

To reduce crashes, the key idea is to provide dilemma-zone protection. One would think yellow time can be extended; however, drivers tend to adapt to this, resulting in lower probabilities of stopping.

Entity

Head of International Relations

Region and location

North America – United States of America

Core technology

Smart wireless sensors and Artificial Intelligence

Unique Breakthrough

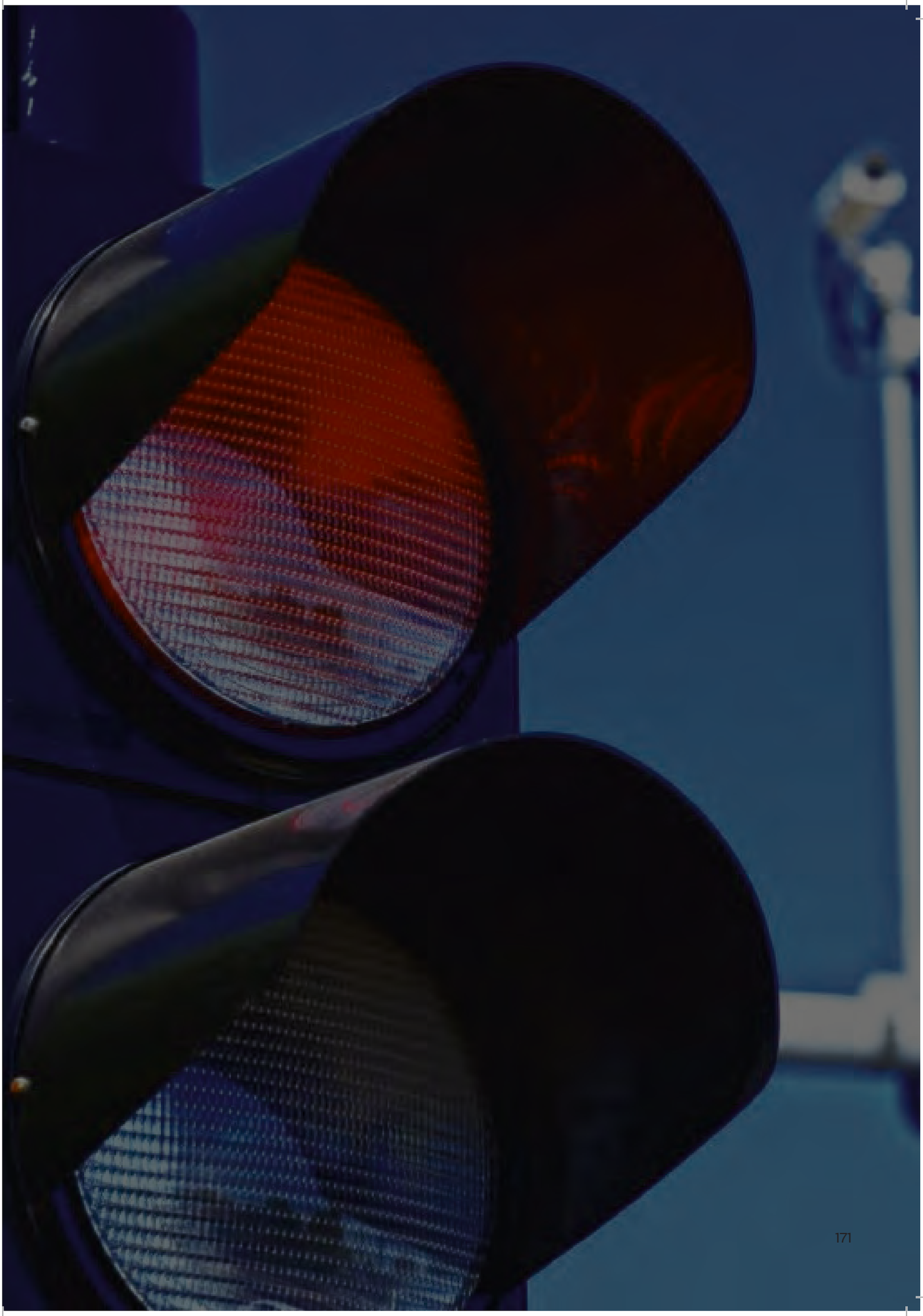
Human-Safety Traffic

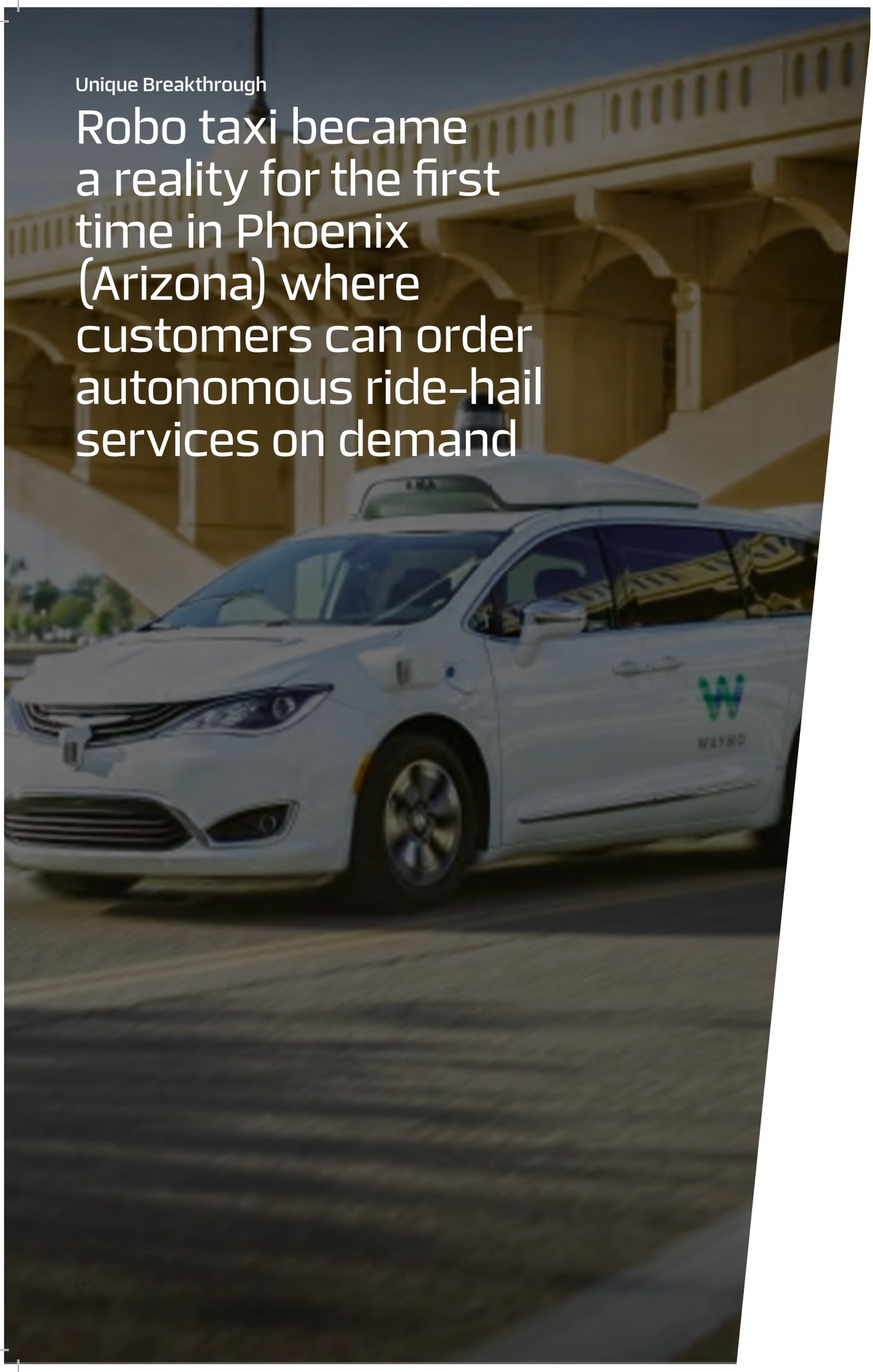
The system can extend the green light to ensure that vehicles can clear the intersection; however, when there are multiple vehicles competing for green time, the system will flash the yellow light before the cars enter the dilemma zone. The wireless devices will be placed in both the traffic lights and in vehicles, many of which are already coming off assembly lines with built-in high-bandwidth, low-latency technologies like 5G broadband. Specialized software at the signal controller will tie the components together.

The project was tested on a stretch of highway in Tippecanoe County, Ind. During tests, the system was able to detect vehicles travelling 55 miles per hour, in a six-foot waypoint radius spaced 50 feet apart, with 95% accuracy. Using this data to estimate risk mitigation, researchers concluded dilemma zone incursions at that particular testing site could be reduced by 34%.

In the past, there were only conceptual-use cases involving onboard vehicle communication technology integrating with live traffic signal control. The new technology moves this integration beyond the merely conceptual. This work provides an implemented real-world use case that addresses an important safety concern, among other applications.

Link – Aashto Journal





Unique Breakthrough

Robo taxi became a reality for the first time in Phoenix (Arizona) where customers can order autonomous ride-hail services on demand

Unique Breakthrough

Waymo One

Waymo launched its fully automated, robo-taxi ride hailing service in Phoenix, rebooting its effort to transform years of autonomous vehicle research into a revenue-producing business.

Phoenix is the only market where Waymo is currently operating its self-driving ride-hailing service, Waymo One, to the general public, though test rides are available in San Francisco.

Entity

Phoenix City Government

Region and location

North America – United States of America

Core technology

Self Driving Vehicle

Description

Waymo has been in the Phoenix area for a few years, largely in the southeast valley (Chandler and parts of adjoining communities). Waymo has been mapping the area and driving vehicles in its service territory to continuously improve vehicle operations.

The four Arizona cities where Waymo is operational have a combined population of 1.2+ million. Waymo says it provides hundreds of rides a week, the majority of which, we presume, are repeat customers

Waymo started providing AV rides in 2018 to people who applied and were selected to be in the early rider program.

Unique Breakthrough

Waymo One

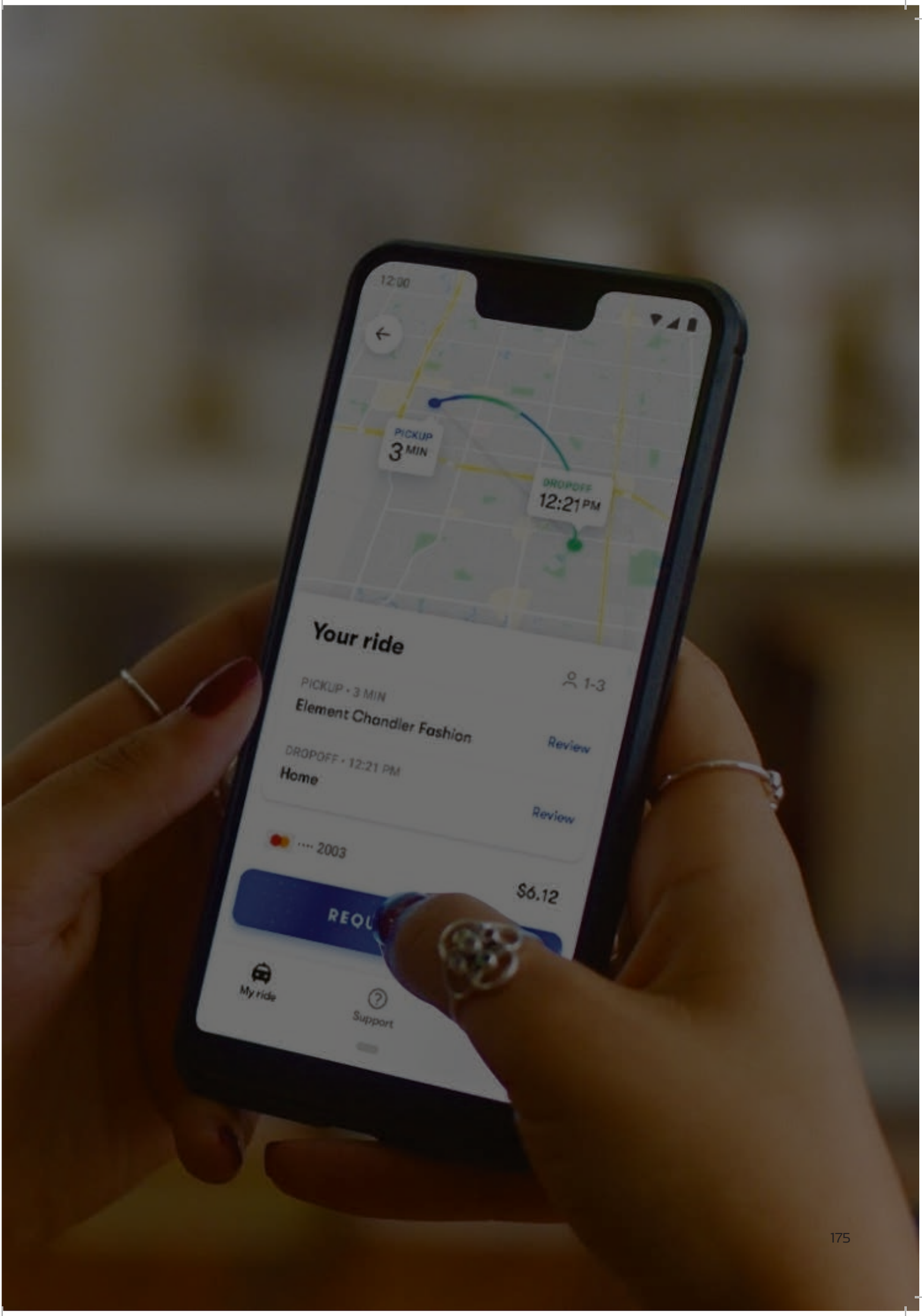
This program was open to the public and offered a Transportation Network Company (TNC) type of service.
A mobile app was used to request service and paid for each ride, the same as for any other ride-hailing service.

A safety operator was on-board to serve as a backup, but the vehicles were fully autonomous and did not require any human intervention.

In general, users of the AV MOD service were satisfied with the convenience and service offered and indicated that it was generally considered better than the traditional choices available to them.

Overall, the project was successful in helping people understand and perceive the benefits of AVs and overcome some of their initial misgivings about such technology. The Waymo services were well received by users and were rated as providing better service than other options.

Video - YouTube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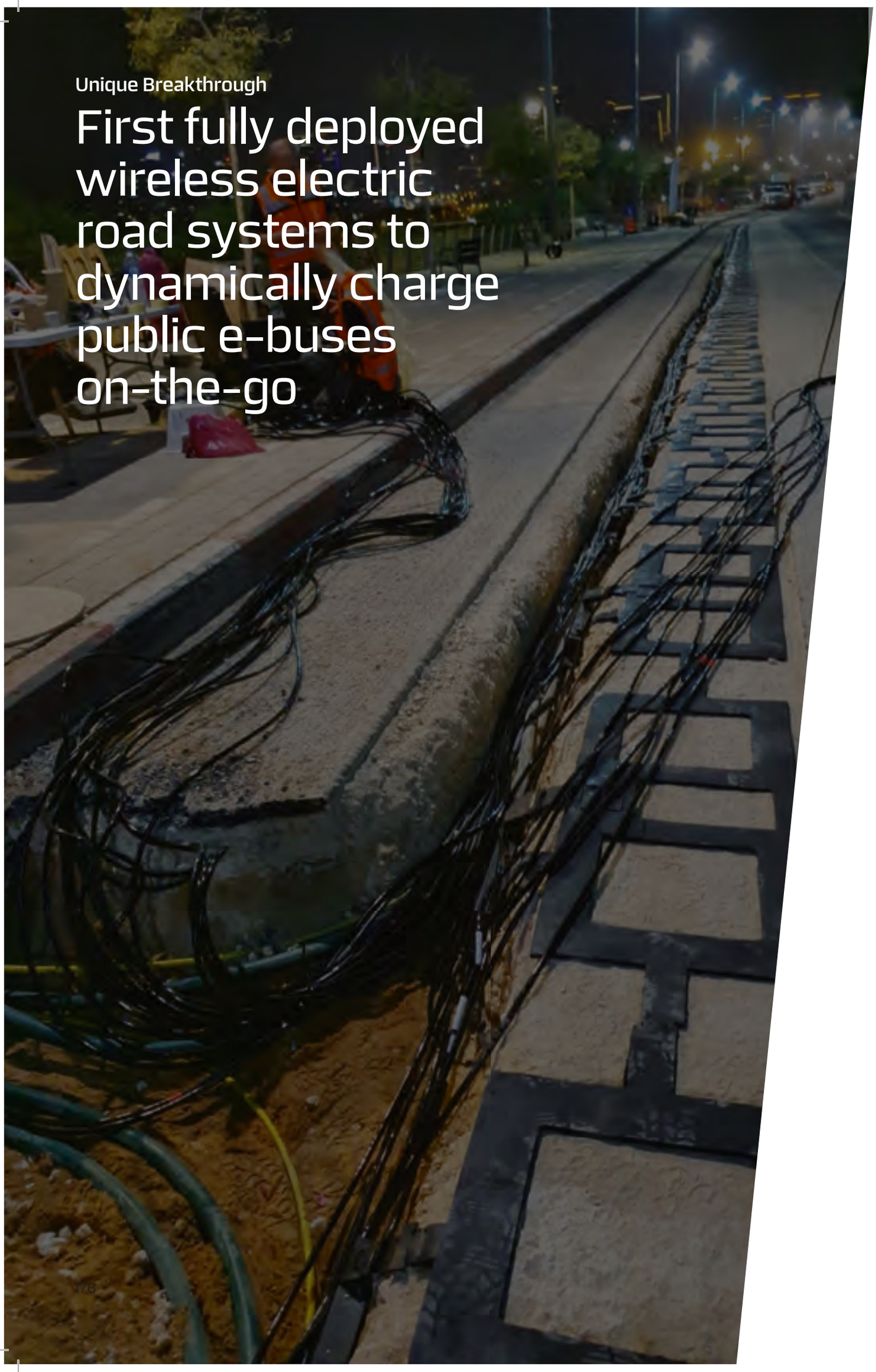


Unique Breakthrough

First fully deployed wireless electric road systems to dynamically charge public e-buses on-the-go

Unique Breakthrough

Smart Roads

Transport is a big part of today's society. Vehicles emit large amounts of carbon dioxide (CO2), which contributes to the greenhouse effect and global warming. The transportation industry accounts for approximately 27% of global greenhouse gas emissions, one of the largest contributors to pollution in the world. Reducing the overall carbon footprint requires use of electric vehicles and electrification of public transport and heavy-duty trucks.

Tel Aviv-Yafo Municipality, in partnership with ElectReon and Dan Bus Company, launched a pilot project to install wireless electric roads for charging public transportation in the city.

Description

The pilot, the first of its kind in Israel, was carried out between Tel Aviv University Railway Station and Klatzkin Terminal in Ramat Aviv – a two-kilometer route including 600 meters of electric road.

The wireless Electric Road project includes a wireless electric charging station at the Tel Aviv University Train Station bus terminal, which charges the stationary e-bus when passengers are boarding and disembarking, making optimal use of idle time at the first stop of the route to charge the bus. The project includes wireless dynamic charging on the Electric Road as well to maximize charging efficiency and reduce service downtime.

Entity

City of Tel Aviv

Region and location

Middle East - Israel

Core technology

Electric vehicle charging, super capacitors

Unique Breakthrough

Smart Roads

The buses on this road will be specially designed electric buses that are capable of being charged directly from under-road electric infrastructure. A complementing static wireless charging station will be at the terminal, to be used by the bus in between rounds.

Tel Aviv-Yafo aims to be the first city in the worked to roll out technology for charging buses on a wide scale through the construction of an electric road. In doing so, the city will evaluate the possibility of additional electric transportation, including public transportation, distribution trucks, and private and autonomous vehicles.

The project is part of Tel Aviv's ambition to increase use of electric vehicles and reduce air pollution in the city.

After completion of the pilot phase, electric roads will be constructed to encourage energy independent public transportation; placing EV charging stations in public spaces; and adopting innovative initiatives and technologies in various fields, including transportation.

ElectReon, Tel Aviv's partner in this project, completed the testing of an electric road system, and presented for the first time an electric vehicle traveling continuously along a 25-meter section within the company's experimental complex in Beit Yanai.

Video - YouTube

Unique Breakthrough

Re-inventing how the world makes materials by creating carbon-eating microbes that reduce CO2 emissions

Unique Breakthrough

Visolis

The manufacturing industry is one of the largest contributors to greenhouse gas emissions worldwide. In fact, in 2020, according to the Environmental Protection Agency, industry accounted for just over 22% of emissions in the United States.

Visolis has come up with an innovative and future-looking solution for the manufacturing industry by creating a technology platform called the 'Visolis process', based on an engineered microbe coupled with efficient processing, leading to near theoretical energy and carbon efficiency.

Entity

United States Department of Energy

Region and location

North America – United States of America

Core technology

Synthetic Biology, Chemical Catalysis

Description

The manufacturing industry must accept its heavy responsibility for emissions of greenhouse gases. According to the Environmental Protection Agency in the United States manufacturing accounts for almost a quarter (22%) of direct carbon emissions and the figure is set to rise. In Europe, the situation is equally dire: the industry emits an annual total of 880 million tons of carbon dioxide equivalents making it one of the largest emitters of greenhouse gases on the continent.

Visolis has come up with a technological advancement that will enable the manufacturing to offset its carbon dioxide emissions by creating microbes that effectively 'eat' CO2 emissions.

Unique Breakthrough

Visolis

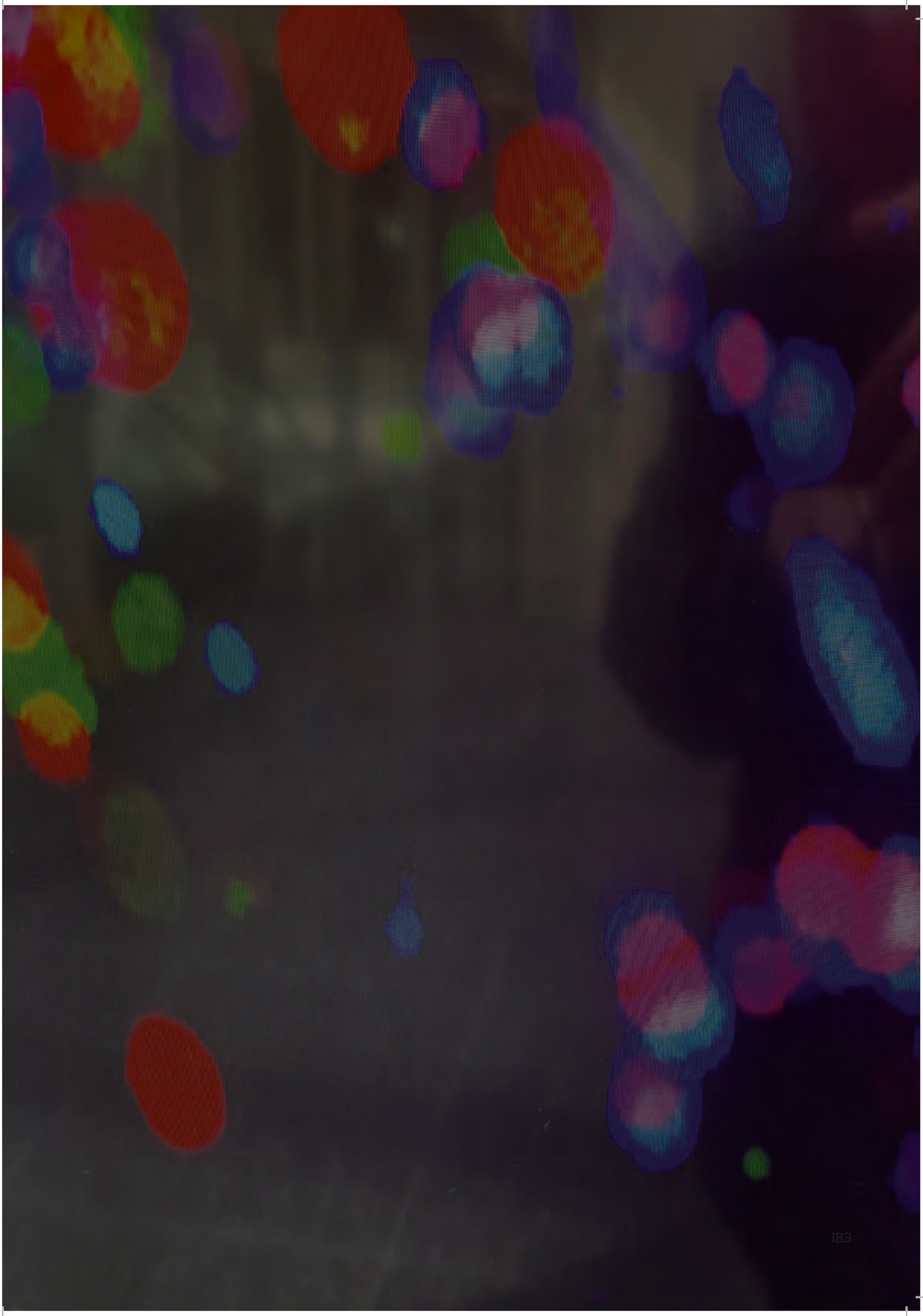
A major goal of the synthetic biology industry is to develop alternative, biology-based methods for industries that typically use petroleum-based products as inputs and produce carbon emissions as outputs. By displacing petroleum-derived material with engineered, bio-based alternatives, Visolis aims to create renewable products for the circular economy.

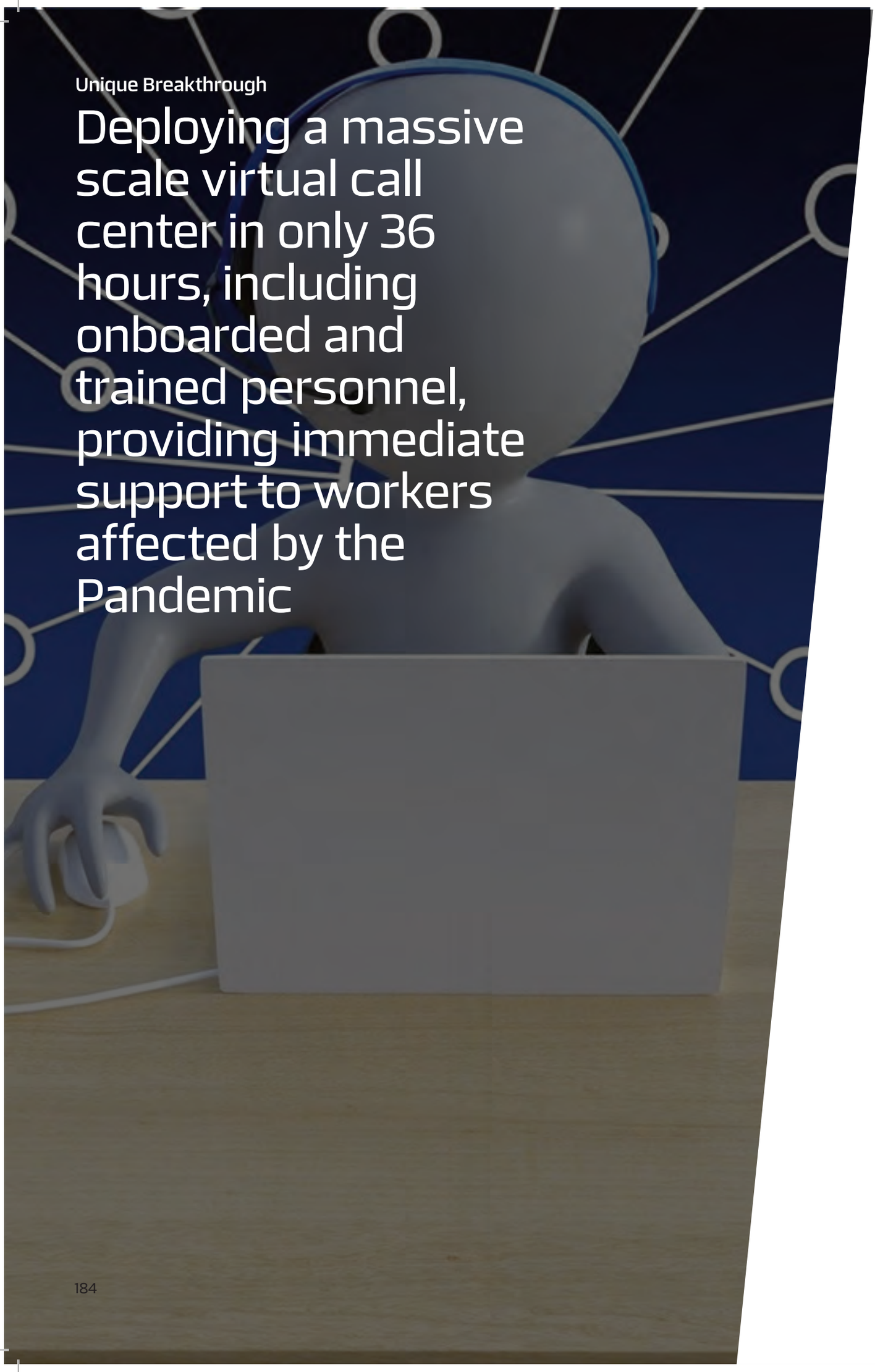
Visolis has begun producing bio-based ingredients for high-end cosmetic products; high-performance polyurethanes; and a solvent for polymer recycling and processing. This solvent is designed to replace petrochemical counterparts that the Environmental Protection Agency has identified as being highly toxic to human and environmental health.

Visolis uses synthetic biology for green and cost-effective production. The adopt flexibility in the production process allowing for changes in products in response to market conditions - this could potentially reduce commercial risk. Compared to petroleum-based processes, the Visolis process could reduce the cost of products by 20-50 percent and reduce greenhouse gas emission by more than 70% and bio-based materials produced in these processes can trap carbon.

Through Cyclotron Road, a fellowship program at Berkeley, California, Visolis collaborated with Advanced Biofuels and Bioproducts Process Development Unit (ABPDU) to demonstrate its process.

Video – YouTube





Unique Breakthrough

Deploying a massive scale virtual call center in only 36 hours, including onboarded and trained personnel, providing immediate support to workers affected by the Pandemic

Unique Breakthrough

ShiftSmart

The COVID-19 pandemic caused shockwaves across the world and impacted everyone from individuals, the economy and small businesses. Young entrepreneurs had to turn around their business operations overnight, and many would not survive the pandemic.

National lockdowns caused major panic and stress for small business owners who turned to the Small Business Administration (SBA) for answers but had to wait hours on the phone. To assist in fielding both business and mental health queries during this time, SBA partnered with Shiftsmart to scale a virtual contact center in a record 36 hours.

Description

As the effects of the pandemic were starting to take their toll, a large number of small business owners were struggling to stay afloat. In order to help alleviate some of the pressure, the SBA released information about their loan program for businesses impacted by COVID-19. Since many businesses were in need of such assistance, the SBA contact centers immediately experienced a 10-20x increase in volume, dramatically increasing wait time for callers. In some cases, callers were waiting up to an hour before they could get a hold of anyone, contributing to uncertainty during the stressful early days of the pandemic.

Entity

US Small Business Administration

Region and location

North America – United States of America

Core technology

Artificial Intelligence

Unique Breakthrough

ShiftSmart

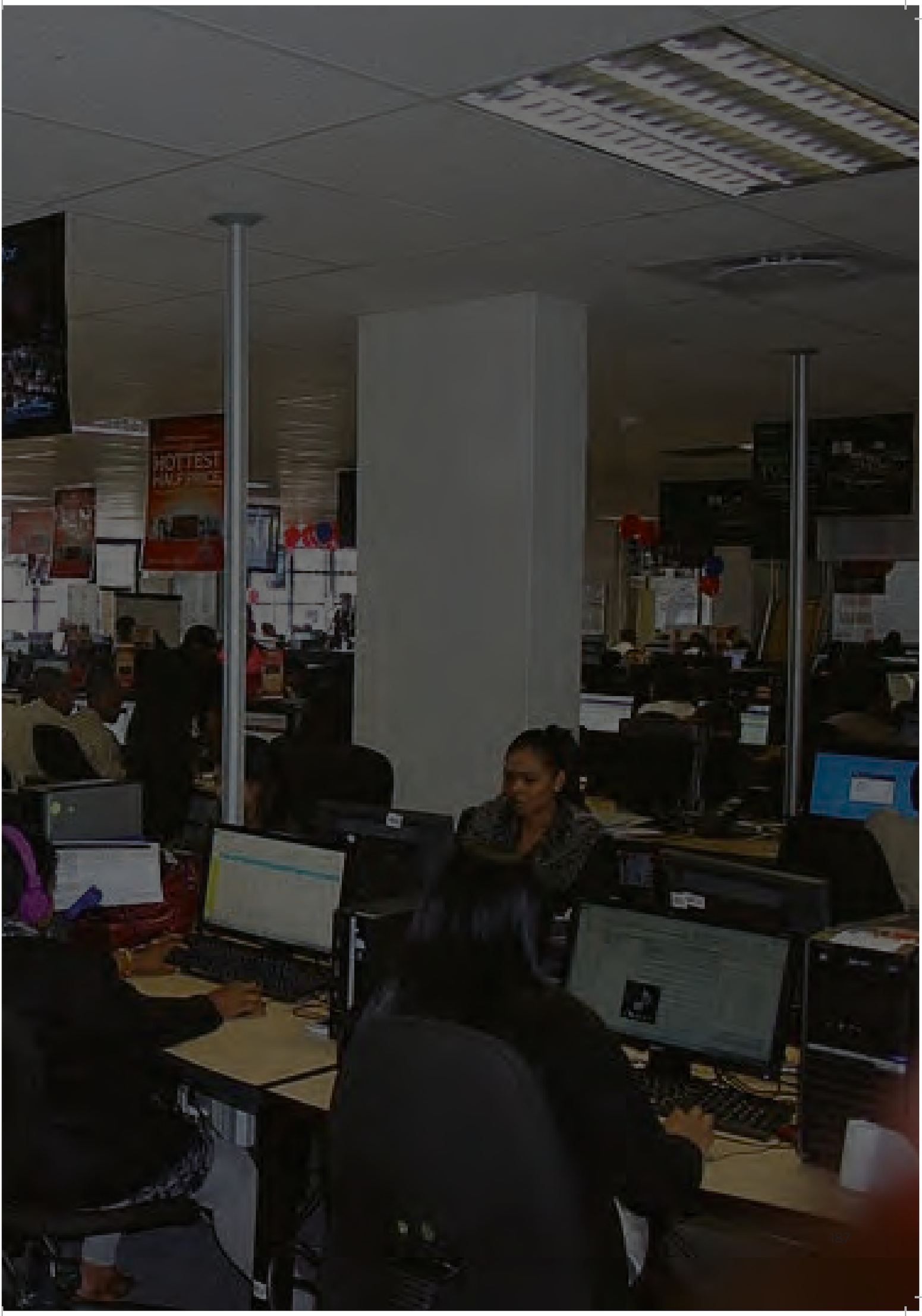
Small business owners were calling with questions regarding the SBA loan application. They wanted to understand how to apply, how much assistance they might get, receive status updates on their application once they had submitted, and more. Shiftsmart, a worker-centric labor platform, provided the SBA with access to a tier-1 contact center built to flex with their unpredictable needs. The call center staffed 10,000 hours of agent time to handle the large influx of calls. The team was able to answer basic FAQs, and for anything requiring more personal information, the team triaged calls based on question type and complexity. This allowed the SBA to allocate resources more effectively based on the caller's needs, in a time when their resources were already strained.

Shiftsmart's model is based on providing flexible work opportunities to hourly workers. The same model also makes it easy for companies to manage increases and decreases in demand to improve utilization, rather than incur the costs of peak-level staffing at all times. Shiftsmart platform tracks worker metrics, so they are able to quickly identify and funnel shifts to the highest performers and optimize each shift for maximum quality and output. This allowed Shiftsmart to ensure that everyone working with the SBA was a high performer.

The success of the contact center is highlighted in key facts below:

- Launched flex contact center in under 36 hours
- Trained and onboarded 2,000 agents
- Instantly flexed up to 10,000 hours of agent call time on first day of operation, eliminating call wait times
- 500 agents were moved to Tier 2 support, handling even more complex calls for the SBA

Link - ShiftSmart Web Site


HOTTEST

Unique Breakthrough

Reducing the cost of space travel by 90 percent by using the world's first fully reusable rocket allowing humankind to go further than it has ever before

Unique Breakthrough

NASA SpaceX

Space travel has always been very expensive. The space race led to great technological advances, but these innovations came at a high cost. For instance, during the 1960s NASA spent $28 billion to land astronauts on the moon, a cost today equating to about $288 billion in inflation-adjusted dollars.

Today SpaceX has completely revolutionized the industry by designing a rocket that can return to Earth in good enough condition and be refurbished, which saves money and helps the company undercut competitors' prices.

Description

As human beings we have been venturing into space since October 4, 1957, when the Union of Soviet Socialist Republics (U.S.S.R.) launched Sputnik, the first artificial satellite to orbit Earth.

In 1958, space exploration activities in the United States were consolidated into a new government agency, the National Aeronautics and Space Administration (NASA).

In 1969, on Apollo 11, the United States sent the first astronauts to the Moon, and Neil Armstrong became the first human to set foot on its surface.

Entity

NASA – National Aeronautics and Space Agency

Region and location

North America – United States of America

Core technology

Autonomous guiding technology, rocket technology

Unique Breakthrough

NASA SpaceX

Since the Apollo lunar program ended in 1972, human space exploration has been limited to low-Earth orbit, where many countries participate and conduct research on the International Space Station.
Apollo 17 became the last manned mission to the Moon, for an indefinite amount of time. The main reason for this was money. The cost of getting to the Moon was, ironically, astronomical.

SpaceX has changed that forever. By creating re-useable rockets, SpaceX has lowered the cost of spaceflight through innovations such as reusable stages and fairings. Just to put this into context: between 1970 and 2000, the cost to launch a kilogram to space remained fairly steady, with an average of US$18,500 per kilogram. When the space shuttle was in operation, it could launch a payload of 27,500 kilograms for $1.5 billion, or $54,500 per kilogram. For a SpaceX Falcon 9, the rocket used to access the ISS, the cost is just $2,720 per kilogram.

These breakthroughs have re-kindled the race to space exploration with the main target now being Mars. NASA and SpaceX are now working together to reach the red planet by 2027 using re-usable rockets that allow for cost-efficient missions and re-deployable infrastructure allowing humankind to reach further than it has ever before.

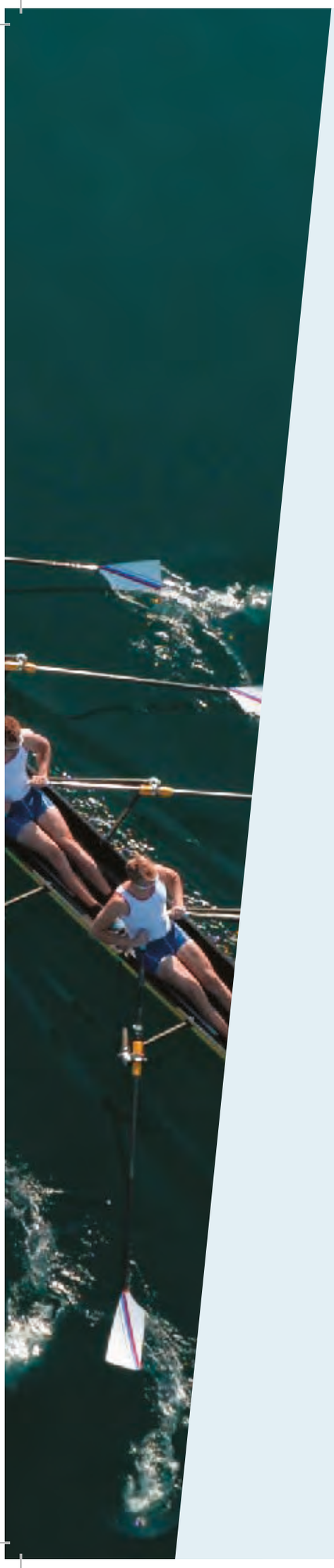
Video - YouTube


SPACEX

Conclusion

This report is offering a sample on how bold government entities are adopting innovative solutions to create wide impact for the resolution of social and environmental problems.

Governments are nowadays following a bolder approach to innovation, showing greater ability to identify issues and embrace advanced solutions to achieve better outcomes.



It's important to underline that this report is not focusing on technology adoption per-se but turns the spotlight on the way technology is used to provide citizens with adequate solutions to support current and future challenges.

Government entities should be fearless and endure in their effort to embrace technology and continuously innovate. Technology is changing with a hectic pace and there is only small visibility on future developments and new enhancements. Government entities should create the right environment and ecosystem to nurture technology advancement and be able to evolve their solutions accordingly.

Moreover, the most promising, impactful and scalable ideas should be adopted broadly, leveraging on the experience and effort already spent to further achieve progress across several domains.

About

As a global consulting partnership in more than 40 countries, our people make us who we are. We're individuals who take as much joy from those we work with as the work itself. Driven to be the difference between a big idea and making it happen, we help our clients break through

Why We are different.
We represent consulting that is both personal and practical. Working alongside you from day one, we never tell you just what you want to hear or something you already know. Instead we're more interested in hearing you talk, asking the questions that get you thinking. With honest advice and practical guidance, we'll help you make the shift from keeping up to breaking through.

We're big enough to have it covered, small enough to really care.
Big change is in the details. "Transformation" is a big word for getting to know every corner of an organization to find what might just be that one, crucial way to make the difference. We know this to be true because it's how we work. While we're 3,600 people strong in more than 40 countries, our size means we're small enough to stay connected. For you this means a dedicated team of doers, bringing both the scale and the focus to make change happen.

We're for less talk, more action.
As flattering as it is to see our peers catch up to what we've been doing for years, we'd rather see less talk about tangible, lasting results and more of the actual getting on with it. With our heartland in operations, we've always known that an idea is only as good as the action it inspires. We promise to deliver, not just deliberate.

We're individual and inclusive at our core.
Kearney people are always themselves. No cookie-cutter box-tickers, but people driven by their own passions and strengths. Working together it's not just bodies in a room, but more a team that's right for you. Because innovation doesn't happen in an echo chamber, we bring refreshing perspectives to established problems. The result is your stand-out success.

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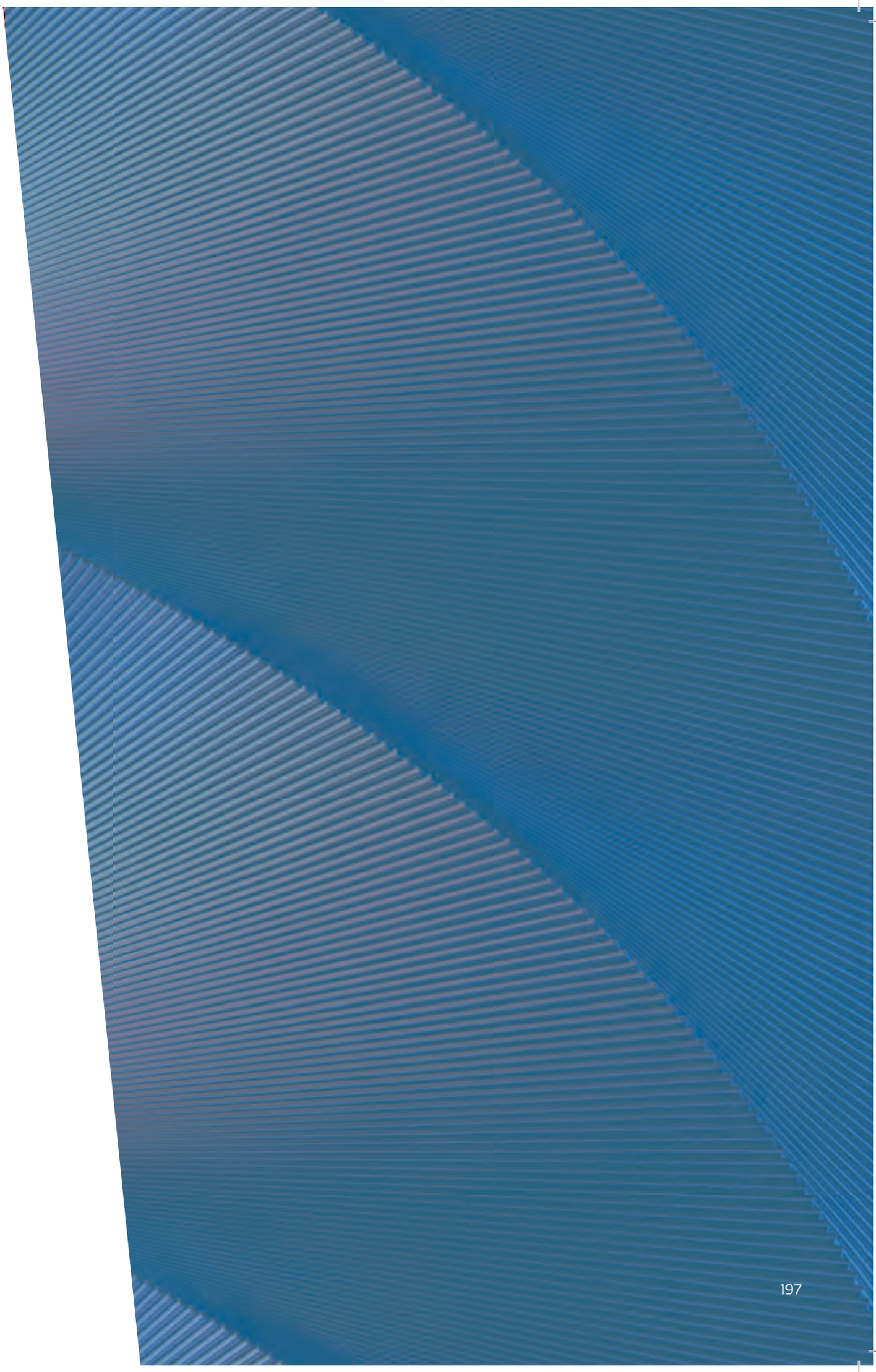

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