

TRAILBLAZER STORIES

2024



PIONEERING THE FUTURE OF INNOVATION AND ENTREPRENEURSHIP

EDITORIAL

TRAILBLAZER STORIES: PIONEERING THE FUTURE OF INNOVATION AND ENTREPRENEURSHIP

→ AS WE FACE EXTRAORDINARY GLOBAL challenges—ranging from climate change and healthcare inequities to resource scarcity and economic instability—it's clear that traditional methods alone are not enough. We must harness the power of innovation and entrepreneurship, especially in emerging markets, to develop effective solutions for these complexities.

At the core of this transformation are artificial intelligence and emerging technologies. AI has the potential to reimagine how we live, work, and interact—whether it's optimizing supply chains or advancing healthcare diagnostics. However, the real impact of these technologies will be determined not by how quickly they advance, but by how inclusively they are adopted.

Supporting entrepreneurship, particularly in emerging markets, is essential to unlocking the full potential of AI and new technologies, ensuring they address the pressing

challenges of developing economies. Entrepreneurs, being closest to these issues, often have unique insights that allow them to craft solutions that are both impactful and sustainable.

Yet, these innovators face substantial challenges, from limited access to funding and mentorship to insufficient infrastructure. At FII Institute, we believe in leveling the playing field. By creating opportunities for startups to thrive, especially in often-overlooked regions, we are contributing to a more inclusive and resilient global economy.

The six trailblazing startups featured in this publication embody this vision. They represent not only technological ingenuity but also a commitment to tackling global challenges through collaboration, innovation, and entrepreneurship. We are proud to share their stories—stories that reflect a future where innovation knows no boundaries.



Richard Attias
CEO, FII Institute

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ENTERING THE ERA OF INNOVATION MULTIPOLARITY

→ **WHATEVER YOUR VIEW OF THE CURRENT** geopolitical moment, you probably believe that it is meaningfully different from the recent past. I certainly think so. I believe we are on the cusp of a truly multipolar era, in which nodes of power and influence will be more widely distributed across the world than they have been for decades, perhaps centuries. I also strongly believe that this multipolarity extends to technology and innovation. Silicon Valley is still a mighty star, with a gravitational field that continues to attract the most bleeding-edge technical talent in the world to build the future in Northern California. However, Silicon Valley is no longer a black hole, engulfing everything around it. There are other stars on other continents, with their own gravitational fields. The epicenter of artificial intelligence (AI) innovation may be San Francisco, but battery innovation might be centered in Ningde and fintech innovation in São Paulo.

The causes of this innovation multipolarity are likely some combination of politics, regulation, demographics, flows of financial and human capital, smartphone penetration and democratization of Silicon Valley's "tribal knowledge." What matters more than the multiple causes, however, are the implications. It is now possible for any entrepreneur, anywhere, to use technology to solve a local problem and launch an interesting company around her solution. It is also more feasible than ever for this founder to expand her company beyond her local borders, to adjacent countries and around the world. The AI revolution that is just beginning makes this "launch and expand" process even simpler, by reducing the need for experienced and expensive human engineers - AI agents are becoming more proficient every day, and don't have time-zone, language or vacation requirements.

For investors, the phenomenon described above creates a tectonic shift in the landscape. Those who want to be The Future, who want to own the next cohort of category-defining companies, now have options. They can still fight for allocation in Silicon Valley funds and companies; but they can also lead the charge in

funding managers and founders who are riding the multipolar wave in other parts of the world, especially emerging markets. Instadeep from Tunisia is raising the bar for AI-powered decision-making in large enterprises. Athena from Vietnam continues to extend the frontier in gaming. Unico is cracking the code on user authentication and fraud in Brazilian e-commerce to unlock trapped GDP. Trax from Singapore is making physical retail as analyzable as digital shopping. Bitso in Mexico is powering financial inclusion with crypto. Aerodyne from Malaysia has built a world-leading drone operation and intelligence platform. These cutting-edge stories from the Global South did not exist a decade ago; multiples more will exist a decade from now.

At FII this year, multipolar innovation is alive and well, including in the subsequent pages, where you will read about founders from Taiwan to Saudi Arabia to Brazil to the UK, all of whom are tackling some of the most urgent problems of our time with homegrown technology.

THE FUTURE IS BEING BUILT, EVERYWHERE! ■



SHU NYATTA,
Cofounder and Managing
Partner, Bicycle Capital

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THE PROBLEM: FOOD WASTE

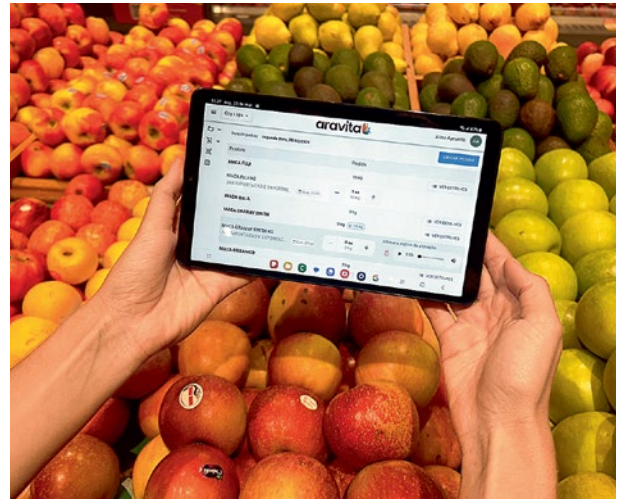
A CRISIS IMPACTING THE ENVIRONMENT, HUNGER, AND ECONOMIC OPPORTUNITY

→ **FOOD WASTE IS A PERVERSIVE ISSUE AFFECTING** every link in the supply chain from farmers to consumers. Globally, one-third of all food produced – about 1.3 billion tons – is wasted each year, with fresh foods such as fruits and vegetables among the most frequently discarded. This waste has severe environmental consequences, contributing nearly 10% of human-made greenhouse gas emissions and wasting valuable resources like water, energy, and land.

Socially, this inefficiency is troubling. While food is discarded, 800 million people globally face hunger and food insecurity, highlighting the disconnect between excess and need. Economically, food waste represents missed opportunities for savings and improved profitability across the food supply chain, emphasizing the need for innovative solutions.

FRESH FOOD IN SUPERMARKETS: A VITAL BUT COMPLEX CATEGORY

In supermarkets, fresh foods such as fruits, vegetables, dairy, and meat account for about 40% of total sales, making them crucial for revenue. However, managing these perishable items is complex due to fluctuating demand and short shelf life. Reliance on outdated tools like spreadsheets and manual processes often leads to



Data-driven management of perishable items

overstocking and waste, or stockouts and lost sales. This inefficiency underscores the need for better, data-driven management.

Supermarkets, with their structured data on sales and inventory, provide an ideal environment for deploying AI-driven solutions that can effectively optimize fresh food management and reduce waste. →

PHOTOS: ARAVITA



ABOUT THE AUTHOR

ALINE is the cofounder of Aravita, where she leads product and operations to help supermarkets reduce food waste and increase sales, integrating economic, environmental, and social impact.

In 2023, Aravita raised \$2.5 million in funding, led by Qualcomm Ventures and 17 Sigma. Her focus on social impact began early with the Green Grease Project at MIT CoLab, aimed at improving the income of waste pickers. She holds a double degree in Chemical Engineering from the University of São Paulo (USP) and École Centrale Paris, where she engaged in entrepreneurial projects that sparked her interest in creating impactful ventures.

→ ARAVITA'S SOLUTION: AI-DRIVEN FRESH FOOD MANAGEMENT

Aravita started its mission by addressing fresh food management through the critical lens of the ordering process, focusing on when, how much, and from whom to buy. The platform leverages AI to transform these decisions, combining deep learning, probabilistic modeling, and real-time data analysis to optimize ordering.

→ **DEMAND FORECASTING:** Aravita's AI models integrate internal data such as sales history and promotions with external factors like weather and seasonality, enabling supermarkets to better predict customer needs.

→ **INVENTORY MANAGEMENT:** The platform continuously updates stock levels by analyzing data from sales, deliveries, and in-store counts, helping supermarkets make precise decisions to avoid overstocking and stockouts.

→ **ORDER OPTIMIZATION:** Aravita simulates various ordering scenarios, accounting for supplier constraints, business rules, and shelf life to recommend optimal quantities and timings for orders, reducing waste and improving efficiency.

→ **USER EXPERIENCE:** Designed for ease of use, Aravita's interface uses GenAI, machine vision, and audio inputs to integrate seamlessly into daily operations, providing actionable insights that simplify decision-making.

PARTNERSHIPS AND MARKET SUCCESS

Aravita's impact has been amplified through strategic partnerships with leading supermarket chains in Brazil, most notably St Marche. As a trendsetter in the Brazilian food retail market, St Marche's adoption of Aravita's solution across all its stores has demonstrated the value of AI-driven fresh food management.

Beyond economic benefits, Aravita's platform enhances client operations by mapping previously unknown losses, allowing supermarkets to identify and address key inefficiencies in their supply chain. Aravita's advanced algorithms not only capture the causes of losses, but also employ stockout prediction models that tackle shortages directly from sales data rather than traditional inventory counts. This helps supermarkets understand the root causes of stockouts and implement proactive measures to mitigate them.

Aravita also improves productivity and governance by streamlining operations, with a 75%–80% adoption rate of its recommendations across client stores. This high level of engagement enables staff to follow optimized processes, freeing up time for customer service and



Aravita integrates seamlessly into daily operations.

other critical tasks. Systematic benchmarking between stores further enhances operational efficiency, helping supermarkets set performance standards and drive continuous improvement.

Aravita's solution extends to understanding consumer behavior more deeply, matching inventory strategies to customer preferences by identifying similar product groups, such as varying packaging sizes. This alignment between inventory and consumer demand allows supermarkets to refine their inventory and sales strategies, contributing to demand forecasting that is up to 30% more accurate. By optimizing how supermarkets stock and sell fresh foods, Aravita reduces waste, boosts sales, and increases overall customer satisfaction.

VISION FOR THE FUTURE: EXPANDING ARAVITA'S IMPACT

Looking forward, Aravita aims to extend its solutions beyond supermarkets to other parts of the food supply chain, including distributors and farmers. The goal is to create a fully integrated system that enhances decision-making at every stage, aligning with global goals for sustainable and secure food systems. By reducing waste and optimizing the fresh food supply chain, Aravita not only helps supermarkets but also contributes to the broader goals of environmental sustainability and food security. ■



DRIFT

Oceans of Energy

UNLOCKING THE POWER OF OUR OCEANS

→ **THE WORLD NEEDS MORE ENERGY, NEEDS IT TO BE green and needs it fast.** Our mission at DRIFT Energy is to solve the world's biggest problem by using its biggest resource - the ocean. The team here is committed to driving the transition to clean energy worldwide by unlocking the power of our oceans. We call it 'Oceans of Energy'.

DRIFT offers a brand-new class of mobile, renewable energy that is independent of any power grid. High performance, state-of-the-art sailing vessels harness deep ocean wind to produce green hydrogen at sea and deliver it globally. They do this using a unique, AI-enabled vessel-routing algorithm that enables them to find and stay in optimum, "Goldilocks" weather conditions. Our energy yachts don't wait for the wind, they follow the wind, returning to port when their hydrogen tanks are full.

GREEN HYDROGEN AND HOW IT FITS IN

Growing demand for clean hydrogen to accelerate the decarbonization of sectors such as heavy industry, transportation and manufacturing is sparking innovation. Green hydrogen, produced via electrolysis using renewable energy, has a much lower carbon footprint than "grey" hydrogen, which is produced from natural gas through steam methane reforming. Green hydrogen currently represents the most fungible commodity, and is the easiest to move back to shore, from both a cost and a technology perspective. DRIFT's complete energy

yacht solution comprises energy generation, storage and delivery from a flexibly deployable platform, transporting green hydrogen to wherever it is needed via a highly integrated and deployable mobile asset.

The technology that DRIFT offers has multiple advantages over existing classes of renewable energy. We are viable in more places and can produce more power, more of the time. Our hardware assets, sailing vessels, are simpler to maintain than most other offshore infrastructure assets (e.g. wind turbines) and the complete solution is crucially up to ten times faster to implement. Having said that, we see our technology as an "and" solution, creating a faster, viable option that complements existing renewable energy sources such as static offshore wind and solar. DRIFT's vessels are essentially platforms for renewable energy.

WORLD'S FIRST NET POSITIVE SHIP

DRIFT is backed by leading Deep Tech investors Octopus Ventures, Founders Factory and the Blue Action Lab. We have also recently won a major grant from Innovate UK, the UK's innovation agency. These investments are a vital step in developing and building the first green hydrogen-producing DRIFT ship - or Most Valuable Yacht (MVY). The funds will catalyse and → bolster our research and development program, as well as enable us to continue to expand the team and onboard new partners as we plan our first keel laying in 2025.

PHOTO: DRIFT



ABOUT THE AUTHOR

With the mind of an engineer and a heart for innovation, **BEN MEDLAND** set up DRIFT Energy Ltd to help tackle what is the most important issue currently facing humanity - how to build a more sustainable planet and tackle climate change.

Prior to founding DRIFT, Ben spent 17 years at Accenture as UK Lead Partner, Digital & Data Strategy Practice. Leaving as Managing Director, Ben has a wealth of experience and extensive networks across numerous industries, including energy and utilities, financial services, technology and the public sector.

He started his early career with BAE Systems, who sponsored his Masters in Systems Engineering at Loughborough University. Ben also holds data science qualifications from Northwestern University and holds Isambard Kingdom Brunel as one of his heroes.

→ We refer to our ships as green self-filling tankers, or fishing boats for energy. The key point is that the first MVY will be the world's first net positive ship. If large-scale hydrogen plants are the hospitals, DRIFT represents the ambulances, shuttling green fuel when and where it is most needed.

The MVY is essentially a high-tech sailing yacht, propelled forward by the wind. As the boat moves through the water, turbines on the underside of the hull serve to convert kinetic energy into electric energy that feeds an onboard megawatt-electrolyser. Through the process of electrolysis, water is then split into hydrogen and oxygen. Solar panels onboard also harvest clean energy for the boat's batteries, powering the onboard air-conditioning and other hotel load components.

Each MVY will have the capacity to produce between 120,000 and 150,000 kilogrammes of green hydrogen every year, storing up to 4 tonnes at a time thanks to its catamaran (twin-hull) design. Due to its highly integrated nature, DRIFT's green hydrogen pathway is up to three times more energy efficient than other renewable energy pathways.

Green hydrogen from our MVYs can be used to power many different sectors, including grid energy, land based and seagoing transport, off-grid net-zero hotel complexes, shipping and heavy industries, such as foundries and distilleries, are just a few examples. Our solution is non-invasive, independent of grid and planning restraints and is gradually scalable for a smoother transition to net zero.

JOURNEY SO FAR

While looking forward to building our first MYV next year, it is also incredible

to reflect on the journey we've had so far. DRIFT has won several awards and accolades, including the inaugural LeZero Innovation Prize at COP28 and recognition from the International Superyacht Society for "excellence in technology." We first demonstrated the production of green hydrogen on a foiling yacht at SailGP in 2022, after which an article was published about DRIFT in The Sunday Times.

As well as many high points, DRIFT has also confronted the many challenges that start-ups face, namely having to forge through challenging periods of having huge ambition but limited resources. Raising capital, recruiting talent and onboarding customers, all while trying to develop a new technology and build a scalable positive business, is hard.

What made a real difference for the team at DRIFT is the sheer volume of goodwill that has come to us from public, industry and government stakeholders. There is just something about that DRIFT lightbulb moment - when you get it, you really get it.

OCEANS OF ENERGY - THE FUTURE

With a focus on innovation and sustainability, we strive to develop and implement renewable energy projects that benefit global communities and the environment. With oceans covering 70% of the globe, DRIFT offers a planet-scale solution to the myriad of challenges faced by global communities grappling with the clean energy transition.

At FII8 we will be unveiling an exclusive opportunity for strategic investors across the marine and energy sectors to take advantage of our unique planet-scale opportunity as a leader in deep ocean energy - a true, blue ocean strategy. ■





DATA-DRIVEN SOLUTIONS FOR THE FUTURE OF OCEAN SUSTAINABILITY

→ **THE OCEAN, COVERING MORE THAN 70% OF EARTH'S** surface, plays a crucial role in maintaining the health of our planet. It regulates the climate, absorbs carbon, and sustains biodiversity that is fundamental to both marine and human life. Yet our oceans are under unprecedented pressure from climate change, pollution, overfishing, and industrial activities. This imbalance threatens not only marine ecosystems but also the global economy and the billions of people who depend on the ocean for their livelihoods.

Despite the urgency of these issues, vast parts of the ocean remain largely unmonitored. The tools and technologies used to observe the ocean are often outdated, fragmented, and limited in their capacity to provide continuous data. This data gap is one of the greatest barriers to protecting marine ecosystems, responding to climate change, and ensuring the sustainability of industries that rely on the ocean.

HydrokinetX is stepping into this space with a mission to change how we monitor and understand the ocean. Through cutting-edge data collection technologies powered by marine renewable energy, HydrokinetX is focused on solving some of the ocean's most pressing challenges. By filling the gaps in ocean monitoring, we can help secure the future of our oceans and the communities that depend on them.

THE OCEAN DATA GAP: A CRITICAL ISSUE

It is estimated that about 80% of the world's oceans remain unexplored, according to the World Ocean Council. This lack of data leaves governments, scientists, and industries with incomplete information about ocean conditions, limiting their ability to make informed decisions. Whether it's safeguarding ecosystems, preparing for extreme weather events, or managing marine resources like fisheries, the absence of real-time, continuous data severely hampers efforts to respond effectively.

In many areas, ocean monitoring relies on periodic expeditions, buoys with limited battery life, or satellite data that lacks the resolution necessary for detailed analysis. These fragmented approaches fall short of providing the high-resolution, real-time insights needed for critical decisions. As the climate crisis intensifies, the need for better ocean data is becoming ever more urgent.

For example, the lack of accurate data makes it difficult to predict extreme weather patterns, such as hurricanes or storm surges. Coastal cities, which are home to millions of people, face heightened risks from rising sea levels and increasingly frequent and severe storms. Without timely data, these cities are often left unprepared, increasing the potential for loss of life and economic damage. →

PHOTOS: ARAVITA



ABOUT THE AUTHOR

JOHN W. TAURIAC is the CEO of HydrokinetX, a pioneering start-up specializing in sustainable marine renewable energy and ocean data platforms. He is an inventor known for developing a patented ocean observation platform that integrates renewable power sources with data collection technologies. With a background in engineering and a passion for ocean innovation, John leads HydrokinetX's efforts to transform blue economies by leveraging ocean intelligence networks. His vision focuses on advancing ocean exploration and supporting global sustainability goals. Under his leadership, HydrokinetX is revolutionizing how ocean resources are monitored and utilized.

→ ADDRESSING THE CHALLENGE WITH TECHNOLOGY

HydrokinetX is leading the charge to close this data gap by focusing on continuous, renewable, and sustainable solutions. Our approach centers on the development of marine-powered platforms that can operate autonomously in the ocean, collecting data without the constraints of traditional monitoring systems. These platforms harness the natural energy of the ocean, such as waves, tides, and currents, allowing for uninterrupted power generation and, consequently, continuous data collection.

By using the ocean's own energy, HydrokinetX eliminates the need for external power sources or frequent battery replacements, reducing both costs and the environmental footprint of ocean monitoring. This innovation not only provides a sustainable energy solution, but also ensures data can be gathered continuously, offering real-time insights into critical ocean variables.

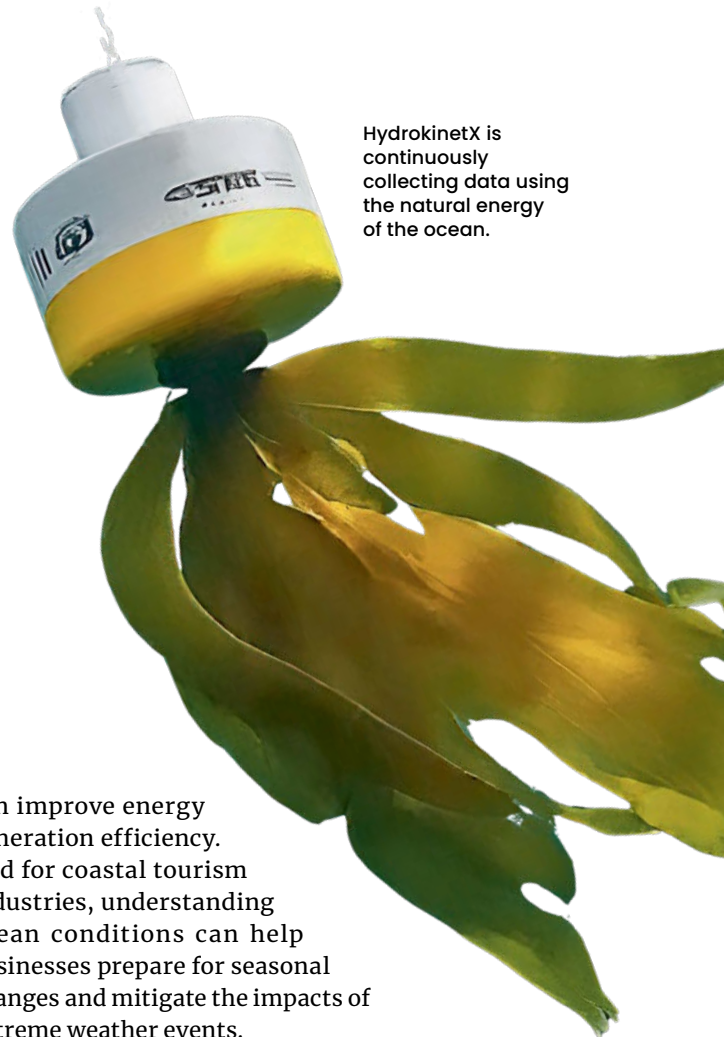
The data collected by these platforms includes key metrics such as water temperature, salinity, ocean currents, and sea-level changes. These variables are essential for understanding both short-term weather patterns and long-term climate shifts. For example, water temperature plays a key role in hurricane formation, and ocean currents influence global climate systems. With access to real-time data on these factors, governments, industries, and scientists can respond more effectively to emerging threats and opportunities.

THE VALUE OF REAL-TIME DATA

The ability to collect real-time data from the ocean will revolutionize how industries and governments operate in the marine environment. The fishing industry, for instance, has long struggled to manage fish stocks sustainably. Overfishing remains a global crisis, with 34% of the world's fish stocks currently overexploited, according to the Food and Agriculture Organization (FAO). Sustainable management of fisheries is critical not only for maintaining marine biodiversity, but also for supporting the millions of people who rely on fishing for their livelihoods.

Real-time data on fish migration patterns, water temperatures, and ocean conditions could help regulatory agencies better enforce fishing quotas, ensuring fish populations are harvested responsibly. Real-time monitoring would also allow fishermen to maximize their efficiency, targeting healthy fish stocks without contributing to overfishing. This data-driven approach could lead to a more sustainable balance between industry needs and environmental protection.

Beyond fishing, real-time ocean data is crucial for sectors such as shipping, energy, and tourism. For shipping companies, accurate ocean data can optimize routes, avoiding dangerous weather conditions and reducing fuel consumption, which in turn lowers emissions. For energy companies, especially those focused on offshore wind and other marine renewable energy sources, precise data on wave and wind patterns



HydrokinetX is continuously collecting data using the natural energy of the ocean.

can improve energy generation efficiency. And for coastal tourism industries, understanding ocean conditions can help businesses prepare for seasonal changes and mitigate the impacts of extreme weather events.

PROTECTING COASTAL COMMUNITIES

Coastal communities stand on the front line of the climate crisis, facing increased risks from rising sea levels, more frequent storms, and coastal erosion. According to the World Bank, more than 143 million people, many of them living in coastal regions, could be displaced by 2050 due to climate-related factors. The potential for large-scale displacement underscores the need for accurate, real-time data to protect these vulnerable populations.

HydrokinetX's platform will provide critical early warning systems for coastal communities. By monitoring sea-level changes, wave activity, and storm patterns, our technology can give local authorities the data they need to issue timely evacuation orders and implement disaster mitigation strategies. In a world where the frequency and intensity of storms are increasing, these early warnings can make the difference between life and death.

HydrokinetX was the winner of the WAVE/Tonomus Project 71 Venture Competition, and as a result was awarded a place in the Tonomus Venture Studio, where venture building and incubation is currently ongoing. ■

IRONYUN[®]

VAIDIO AI VISION PLATFORM

INNOVATIVE SOLUTIONS AT IRONYUN: SHAPING THE FUTURE OF VISION AI

→ **FOUNDED IN 2015 AND BASED IN STAMFORD, CT,** IronYun is a leader in AI-driven video analytics. In 2021 and 2022, IDC recognized IronYun as a “Major Player” in Video Analytics and Video Analytics as a Service, saying that IronYun’s Vaidio® AI Vision Platform “is a good decision for enterprises that want to upgrade to advanced analytics that incorporate proven and accurate AI.” NVIDIA’s Director of Smart City initiatives remarked, “Out of hundreds of solutions, Vaidio is one of a handful that ranks highest in terms of platform maturity and real-world customer value.” From 2020 to 2024, Vaidio won the US Security Industry Association’s New Product & Solutions Awards for Commercial Monitoring, Mobile Solutions, Video Analytics, Retail Loss Prevention, and Managed Services, taking home the Best New Product Overall award for 2024.

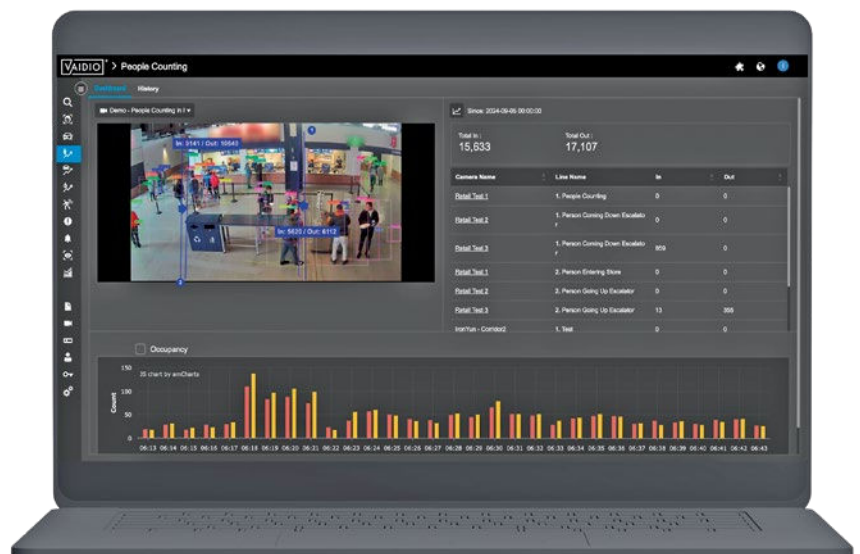
GLOBAL REACH AND IMPACT

IronYun’s impact extends far beyond the US. Vaidio has been deployed across 30 countries in sectors ranging from transportation and public safety to retail. International media companies, casinos, and resorts all report 99%+ reduction in false alerts, one company reducing from 2,000 a month on average to ten per month. Vaidio video analytics save a manufacturer \$1 million annually with

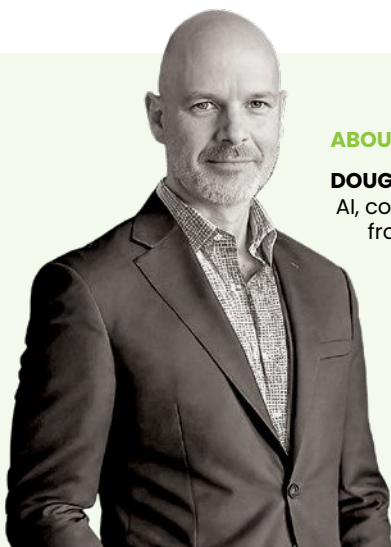
improved raw material grading. A smart railroad system in Taiwan alerts train conductors to problematic crossings with 99% accuracy. A retailer’s custom retail loss prevention solution achieves 90% accuracy in detecting abnormal shopping behavior for high-value items. And a city in the US Midwest anticipates significant improvements in traffic flow, reductions in accidents, and traffic analysis cost savings. These international deployments demonstrate IronYun’s capacity to deliver quantifiable value across diverse environments.

FOUNDER’S VISION

Paul Sun, IronYun’s founder and CEO, began his career in AI research in the US-led Microelectronics and→



PHOTOS: IRONYUN



ABOUT THE AUTHOR

DOUGLAS HAMMER has managed strategy, marketing, and channel sales for AI, computer vision and data storage companies for 20 years. He holds a BA from UC Berkeley, an MBA from NYU Stern, and a U.S. Patent on information risk assessment. He initiated and launched a \$40 million net new line of business with NetApp. As VP of Marketing for IronYun, Hammer is responsible for marketing, strategy and business development for the award winning Vaidio® AI Vision Platform and its value-added real-time, video search, and business intelligence applications.

→ Computer Technology Corporation (MCC) in the 1980s. Subsequently, Paul founded and led exits for Avidia (\$100 million M&A) and DSL.net (\$1.5 billion IPO), and led the smart city team at Taiwan's ITRI. Paul parlayed these experiences into IronYun, with the drive to create the world's most comprehensive general intelligence platform – to take in sensory data from cameras and other IoT devices and, with automated common-sense AI, convert it into actionable insights and predictive foresight.

THE STATE OF THE MARKET

The global video analytics market is growing at a 22.7% CAGR, fueled by advancements in AI, IoT, and cloud computing. There is increasing adoption across sectors such as public safety, transportation, logistics and healthcare, and demand is particularly strong in smart city applications to enhance safety, security, and operational efficiency. With major countries investing heavily in smart city initiatives, the adoption of intelligent video analytics (IVA) is expected to accelerate, driving further growth and innovation in the market over the next decade.

ALTERNATIVE SOLUTIONS

The IVA market is generally split between camera-based solutions and independent software vendors (ISVs), and between on-premises and cloud-based solutions.

Camera-based solutions install without extensive backend infrastructure but lack scalability and manageability in city-wide deployments. However, AI cameras usually support only a single analytic function, such as intrusion detection, face recognition, or license plate recognition (LPR). This restricts versatility and scalability. Adding more functionality requires adding more cameras. Furthermore, these systems typically rely on low-power chips, limiting processing speed and accuracy compared to server- or cloud-based solutions. Camera analytics are often restricted only to real-time alerting applications. As a result, while camera-based solutions provide quick, localized insights, they may not be ideal for large-scale, multifunctional, or highly accurate video analytics requirements.

Cloud- and server-based alternatives also have limitations. Many alternatives offer cloud-only deployment options that can be incompatible when on-premises solutions are required for security, compliance, or infrastructure reasons. Other solutions rely on proprietary camera + analytic + vms stacks, which can significantly increase costs and reduce flexibility relative to an open platform. Several solutions are narrowly focused on single-functions such as LPR, facial recognition, retail merchandising or weapon detection, lacking the broad, multifunctional video analytics capabilities modern cities require.

THE VAIDIO[®] AI VISION PLATFORM

IronYun's Vaidio platform is a game-changer. It provides broader functionality than camera-based systems and

offers flexible, open integration across any IP camera or video management system (VMS). Vaidio supports multimodal deployments – whether on-premises, in the cloud, or as a service – making it ideal for complex

→ **COMPUTE EFFICIENCY:** Vaidio 8.0 is 40% more compute efficient than its predecessor. Advanced code optimization allows each GPU to handle more cameras, while preprocessing algorithms filter out irrelevant frames to reduce unnecessary processing. This efficiency lowers operational costs and reduces infrastructure requirements, making Vaidio highly cost-effective.

→ **DEPLOYMENT FLEXIBILITY:** Vaidio supports deployment across edge devices, servers, Kubernetes, and the cloud. Its Kubernetes architecture enables dynamic scaling and five-nines availability, simplifying large-scale deployments. For example, in large-scale public safety deployments in Taiwan, Vaidio's flexible architecture helped monitor over 1,000 cameras, ensuring 99.99% uptime and reducing operational costs by 15%.

→ **SERVICE PROVIDER ARCHITECTURE:** Vaidio enables partners to deliver Video Analytics as a Service (VAaaS) with a 2-tier service provider model and usage-based billing. This architecture is scalable, supporting thousands of end users. It has been instrumental in projects such as a multi-city deployment across the UAE, where Vaidio enabled centralized analytics services for more than 500 commercial clients, improving city-wide surveillance efficiency by 25%.

infrastructures. Its analytics capabilities span real-time monitoring, forensic search, and business intelligence, making it a versatile choice for city-wide deployments and industry-specific needs.

Three key factors set Vaidio apart from other video analytics solutions: Compute Efficiency, Deployment Flexibility, and Service Provider Architecture.

VISION FOR THE FUTURE

Under Paul Sun's leadership, IronYun will continue to lead the video analytics market, focusing on innovation, compute efficiency, and deployment flexibility. With ongoing plans to enhance Vaidio's capabilities, IronYun is exploring AI-driven automation, generative AI, and large language models (LLMs) to further expand Vaidio's predictive and analytical power. The company's vision is to provide unparalleled efficiency and intelligence in video analytics, ensuring that organizations can make smarter, faster decisions. ■



 Sadeem

INNOVATING FOR A SAFER FUTURE: THE SADEEM JOURNEY

→ **FLOODING IS THE MOST PREVALENT NATURAL** hazard worldwide, affecting millions of people and causing significant economic and environmental damage. The urgency to address this issue has never been greater, especially as climate change and urban expansion exacerbate the frequency and severity of flash floods. At Sadeem, our core mission is to mitigate these flash floods and enhance urban resilience through innovative solutions. Floods occur more frequently and with greater intensity due to a combination of factors, including extreme weather events and rapid urbanization. In this context, flash floods, characterized by their sudden onset and severe impact, pose a particularly daunting challenge. As a start-up focused on addressing this issue, we recognized early on that effective flood management requires more than just response measures – it demands proactive, real-time solutions that can anticipate and mitigate risks before they escalate. Understanding the pressing need for effective flood management, we embarked on a journey to develop cutting-edge technologies that address this critical challenge.

THE LAUNCH OF EQUA: A GROUNDBREAKING START

In our quest to combat the flood crisis, in 2018 we launched our first product, Equa – a sensor designed to monitor water levels and traffic on urban roads. What set Equa apart was its unique capability to measure both flood risks and traffic conditions without physical contact. This dual functionality provided a comprehensive view of urban conditions, enabling more effective prevention and management of flash floods.

Equa not only innovated in its technological approach, but also delivered tangible operational benefits. By integrating advanced sensors and real-time data analytics, Equa significantly reduced the need for unnecessary visits to the drainage network by up

to 50%. This reduction in field visits translated into substantial cost savings and operational efficiency. Furthermore, Equa's ability to provide real-time data led to a remarkable 75% reduction in response time to emergencies. This swift response capability is critical in mitigating flood risks and enhancing urban safety. The introduction of Equa marked a significant milestone for us, demonstrating our commitment to innovative solutions that address complex urban challenges while delivering measurable improvements in operational efficiency and emergency response.

PIVOTING TO URBAN DRAINAGE DIGITIZATION

The launch of Equa offered us invaluable insights into the flood prevention market and highlighted areas for further innovation. In 2022, we decided to pivot our focus to the digitization of urban drainage systems, which serve as the first line of defense against floods. →



Equa: No more unnecessary visits to the drainage network.

PHOTOS: IRONYUN



ABOUT THE AUTHOR

ESTEBAN CANEPA is from Mexico and holds a Bachelor's degree in Mechatronics Engineering from Monterrey Institute of Technology, where he was the top student. He pursued a Master's in Mechanical Engineering and a PhD in Electrical Engineering at King Abdullah University of Science and Technology (KAUST), graduating in 2011 and 2016, respectively. During his studies, he collaborated with MIT, KTH, and UCLA, and co-invented a patent in the smart city field. Esteban is now the cofounder and CTO of Sadeem (sadeemwss.com), a Saudi tech start-up specializing in novel sensors for monitoring flash floods and enhancing urban resilience. Sadeem won the Best Global Startup award at GITEX Dubai in October 2017 and presented its technology at the UN Conference of the Parties later that year.

→ This strategic shift was driven by our understanding that maintaining and optimizing drainage systems is crucial for preventing flood damage. Our second product, Voda, was developed in response to this need. Voda is a sensor designed to monitor water accumulation and the status of openings in manholes and catch basins. In conjunction with Voda, we introduced a novel web platform specialized in drainage management, further enhancing our ability to offer comprehensive solutions for urban flood prevention.

The success of our initial products and the growing demand for advanced flood management solutions prompted us to expand our offerings. In early 2024, we launched the Preventive Plan Module, an innovative addition to our digital solutions. This module focuses on the digitalization of daily preventive maintenance for urban drainage systems, providing our clients with tools to streamline and optimize their cleaning operations. By incorporating this module into our platform, we aimed to deliver even greater value to our clients, helping them maintain their drainage systems more efficiently and effectively.

Our solutions have had a profound impact on flood management. Through our integrated approach, we have achieved a reduction in economic losses by up to 30% during flash floods, highlighting the significant cost savings realized through effective flood prevention. In addition, our technology has proven highly effective in eliminating 5 out of every 10 flood incidents, further underscoring our commitment to enhancing urban safety and resilience. These advancements reflect our dedication to impactful, data-driven solutions that make a tangible difference in flood management and urban infrastructure.

Looking beyond our current achievements, we have a strategic vision for expanding our impact to regions beyond MENA. Our solutions, with their adaptable technical framework, are well-suited for international deployment. However, we recognize that each region has unique dynamics and legal considerations regarding drainage maintenance. By carefully navigating these factors and tailoring our approach to fit local regulations and practices, we aim to bring our transformative technology to new markets worldwide, enhancing urban flood management on a global scale.

PIONEERING THE FUTURE OF FLOOD MANAGEMENT

As we approach the end of 2024, we are excited to unveil Voda 2.0, an upgraded version of our original

sensor. Voda 2.0 represents a significant leap forward in drainage monitoring technology, featuring novel advancements and approaches that set it apart from its predecessors. This new sensor will further revolutionize how we monitor and manage drainage systems, solidifying our position as a leader in flood mitigation technology.

Looking ahead, we are also exploring ways to enhance our solutions to prevent floods and minimize their impacts even further. By integrating advanced flood models and artificial intelligence into our platform, we aim to provide even more accurate predictions and effective responses to flood events. These innovations will enable us to refine our approach to flood management, offering our clients enhanced tools for safeguarding urban environments against the growing challenges of climate change.

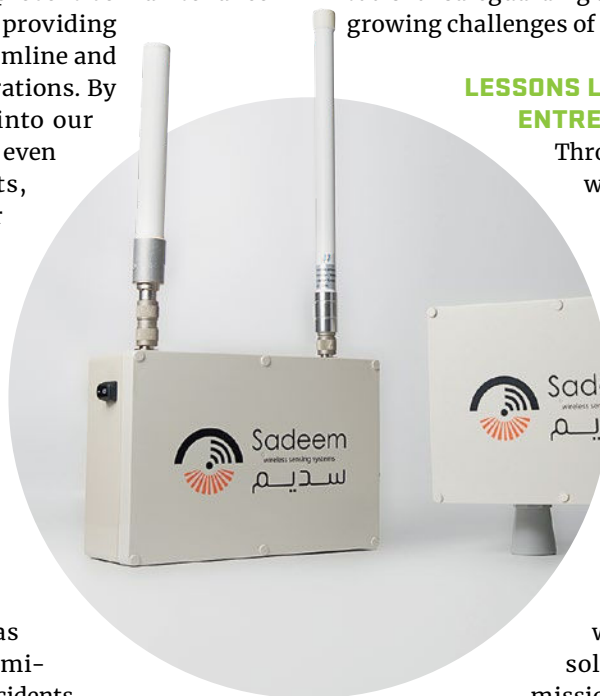
LESSONS LEARNED FROM OUR ENTREPRENEURIAL JOURNEY

Through our experiences at Sadeem, we have learned that innovation is not just about developing new technologies, but about focusing on the core problem and refining solutions to address it effectively. It requires a clear vision, strategic pivoting when necessary, and the discipline to say no to opportunities that, while attractive, do not align with our primary goals.

One critical lesson we learned was to avoid diversifying our solutions to the point where our mission becomes unclear. By staying focused on our goal to mitigate flash floods, we have driven meaningful advancements in flood management and made a significant impact in our field.

Our journey over the past few years has been marked by a relentless focus on improving the value we provide to our clients. We have continuously sought to enhance our solutions, striving to do what we do better and adding features that delight our customers and keep us ahead of the competition. This commitment reflects our core belief that true progress comes from addressing the fundamental problems our start-up aims to solve, while avoiding distractions and staying true to our mission.

In conclusion, the evolution of Sadeem is a testament to the power of innovation and dedication in addressing global challenges. From our pioneering efforts with Equa to the transformative developments with Voda and the upcoming Voda 2.0, we are proud of the progress we have made. As we continue to evolve and grow, our focus will remain on making cities safer and more sustainable through innovation and strategic vision. ■



WOOT ANDO

PIONEERING THE FUTURE OF ROBOTICS IN THE FRESH PRODUCE INDUSTRY

→ **IN TODAY'S RAPIDLY EVOLVING TECHNOLOGICAL** landscape, innovation is not just a buzzword; it's a necessity. Few embody this truth more than Dr. Atif Syed, the visionary CEO of Wootzano, a company that has been pushing the boundaries of robotics in one of the most challenging sectors – the fresh produce industry. As the world prepares for the upcoming Investment Day at FII8 in Riyadh on October 31, 2024, it is important to shine a spotlight on trailblazers like Dr. Syed, whose groundbreaking work in robotics is reshaping the global food supply chain.

THE GROWING CHALLENGE OF LABOR SHORTAGES IN FRESH PRODUCE

The fresh produce industry relies heavily on skilled human labor to ensure delicate fruits and vegetables are carefully packed and processed for retail. As the demand for fresh produce increases, the industry faces a critical challenge: labor shortages. Harvesting, sorting, and packing fresh fruits like tomatoes, berries, and grapes require precision and care that only a skilled human workforce has been able to provide – until now.

The scarcity of workers is becoming a global issue, with many countries struggling to maintain year-round labour availability. This is where Dr. Syed's vision has made a transformative impact. Under his leadership, Wootzano has designed solutions that cater to the sector's most pressing needs, without disrupting established workflows.

WOOTZANO'S INNOVATIVE APPROACH: THE AVARAI COBOT

At the heart of Wootzano's success lies its flagship product: Avarai, a highly advanced robotic system

designed to tackle the unique demands of the post-harvest process. Avarai stands out in the industry for its ability to supplement a shrinking workforce with cutting-edge robotic technology, efficiently taking on tasks previously reliant on human labor.

What sets Avarai apart is its dexterity. The system is equipped with an award-winning electronic skin that mimics human touch, providing unparalleled sensory awareness. The electronic skin is a marvel of engineering, designed from a silicone-based polymer with layers of metal that respond to changes in pressure. This allows the robot to accurately sense the amount of force needed to handle soft and delicate produce without causing any bruising or damage.

Dr. Syed and his team have ensured that every feature of Avarai was created with the customer in mind. The system is not just about automation, but about enhancing the quality and consistency of the packing process without compromising standards. With its cutting-edge vision technology and sophisticated machine learning algorithms, Avarai is capable of real-time learning and self-improvement, continually optimizing its performance and delivering consistent, high-quality results. This ability to adapt without external inputs represents a breakthrough in the application of artificial intelligence (AI) in robotics.

THE TECHNOLOGY BEHIND THE INNOVATION

Wootzano's proprietary technology is what makes its robotic systems not only effective, but revolutionary. The electronic skin on Avarai operates as a highly compliant force and pressure sensor. It detects touch in a way that closely mimics human sensitivity, a feature crucial for handling soft fruits like tomatoes, ber- →

PHOTO: PR



ABOUT THE AUTHOR

DR. ATIF SYED is the CEO and founder of Wootzano, a pioneering robotics company specializing in advanced tactile sensing technology. With a PhD in Electronics Engineering, he has extensive expertise in robotics, AI, and materials science. Under his leadership, Wootzano has developed innovative robotic systems with human-like touch capabilities, revolutionising sectors like agriculture and manufacturing. Recognized as a visionary entrepreneur, Dr. Syed has received numerous accolades for his contributions to the field of robotics. His work is driving significant advancements in the integration of robotics and AI to enhance automation and human-robot interactions.

→ ries, and grapes. This capability is made possible by the piezoresistive response created when the layers of metal deposited on the silicone-based polymer deform under pressure. The precise measurement of force allows the robot to apply just the right amount of pressure to prevent damage.

But Wootzano's innovation goes beyond physical handling. The company's advanced computer vision systems can estimate the weight of individual pieces of produce and detect quality defects for more accurate sorting and packing. This ensures consistency in quality control, preventing damaged or substandard items from reaching consumers. The system can even snip vines on fruits like grapes and tomatoes with precision, using machine learning algorithms to determine the exact location of the cut needed for optimal weight and quality.

By combining these innovations, Wootzano is not only solving labor shortages but also improving efficiency and reducing food waste. Its robotic systems can identify and discard damaged produce at the packing stage, ensuring that only the highest-quality products make it to market. This reduces food waste, a significant environmental and economic concern today.

MAKING TECHNOLOGY ACCESSIBLE

As a growing business, Wootzano understands that accessibility is key to widespread adoption of its technologies. The company has designed flexible payment plans that allow customers to pay for the robotic systems in a way that mirrors the cost of hiring human workers. This innovative business model is pivotal in lowering the barriers to entry for businesses, particularly in regions where labor is cheaper, but still inconsistent or unavailable.

By making their technology accessible in this way, Wootzano has expanded its presence not only across the UK, but also into international markets across the Middle East, Australia, the USA, and Asia. In these regions, the cost of automation can be a deterrent, but by offering a model that competes directly with human labor costs, Wootzano is making advanced robotics an attainable solution.

Moreover, Wootzano's technology fosters economic growth by enabling businesses to operate more efficiently and reliably. For countries facing labor shortages or economic barriers to automation, Wootzano's robotic systems offer a way forward, allowing them to remain competitive in the global market.

CONTRIBUTING TO JOB CREATION, ECONOMIC GROWTH, AND SUSTAINABILITY

Beyond solving labor shortages, Wootzano's robots contribute to sustainability in the fresh produce sector. By reducing food waste through more precise handling and quality control, the company is making the entire packing process more sustainable. This commitment to reducing waste is critical in a world where food waste represents a significant threat to global food security.

By automating labor-intensive tasks and enhancing productivity, the company's technology is driving growth in specific regions, reducing costs for businesses, and promoting sustainability. Below are key areas of contribution:

Sustainability Contributions

→ **REDUCTION IN FOOD WASTE:** Wootzano's robotic systems have contributed to up to 20% less food wastage through their precision and consistency in handling fresh produce. This efficiency reduces the environmental impact of agriculture and food processing, conserving natural resources and minimizing the need for overproduction.

→ **ROUND-THE-CLOCK FUNCTION:** Wootzano's robots operate 24/7, which increases production capacity and allows companies to meet demand without the need to significantly scale up human labor. This enhances sustainability by making better use of energy and reducing idle time on production lines.

Success Metrics for Business Adoption

1. REDUCTION IN LABOR COSTS: Wootzano's robot lines have reduced the need for human labor by up to 60%. This translates into significant savings for businesses, especially in regions facing high labor costs or shortages.

2. FAST RETURN ON INVESTMENT (ROI): Businesses using Wootzano's technology see a rapid ROI, especially due to the no upfront costs under Wootzano's lease agreement. Combined with increased productivity and reduced labor needs, companies quickly recover their investment and continue to benefit from ongoing operational savings.

3. OPERATIONAL EFFICIENCY: Wootzano's sleek modular design allows for quick implementation, with systems installed on day one and ready to go by day two. This enables businesses to quickly scale operations without downtime, further enhancing economic output.

In summary, Wootzano's technology provides not only tangible business benefits, but also strengthens regional economies and contributes to environmental sustainability through job creation, reduced food waste, cost savings, and the efficient use of resources.

WOOTZANO'S JOURNEY FROM START-UP TO GLOBAL PLAYER

Since its inception, Wootzano has transformed from a start-up in the North East of England to a global player in the robotics industry. Under Dr. Syed's leadership, the company has secured multi-million dollar contracts from around the world, a testament to the effectiveness of its technologies and the dedication of its team. This success reflects Wootzano's innovative spirit and its ability to stay ahead of the curve in a rapidly changing market. Dr. Syed attributes much of the company's success to the inclusive and creative environment fostered within Wootzano.

CONCLUSION: THE FUTURE OF AUTOMATION IN FRESH PRODUCE

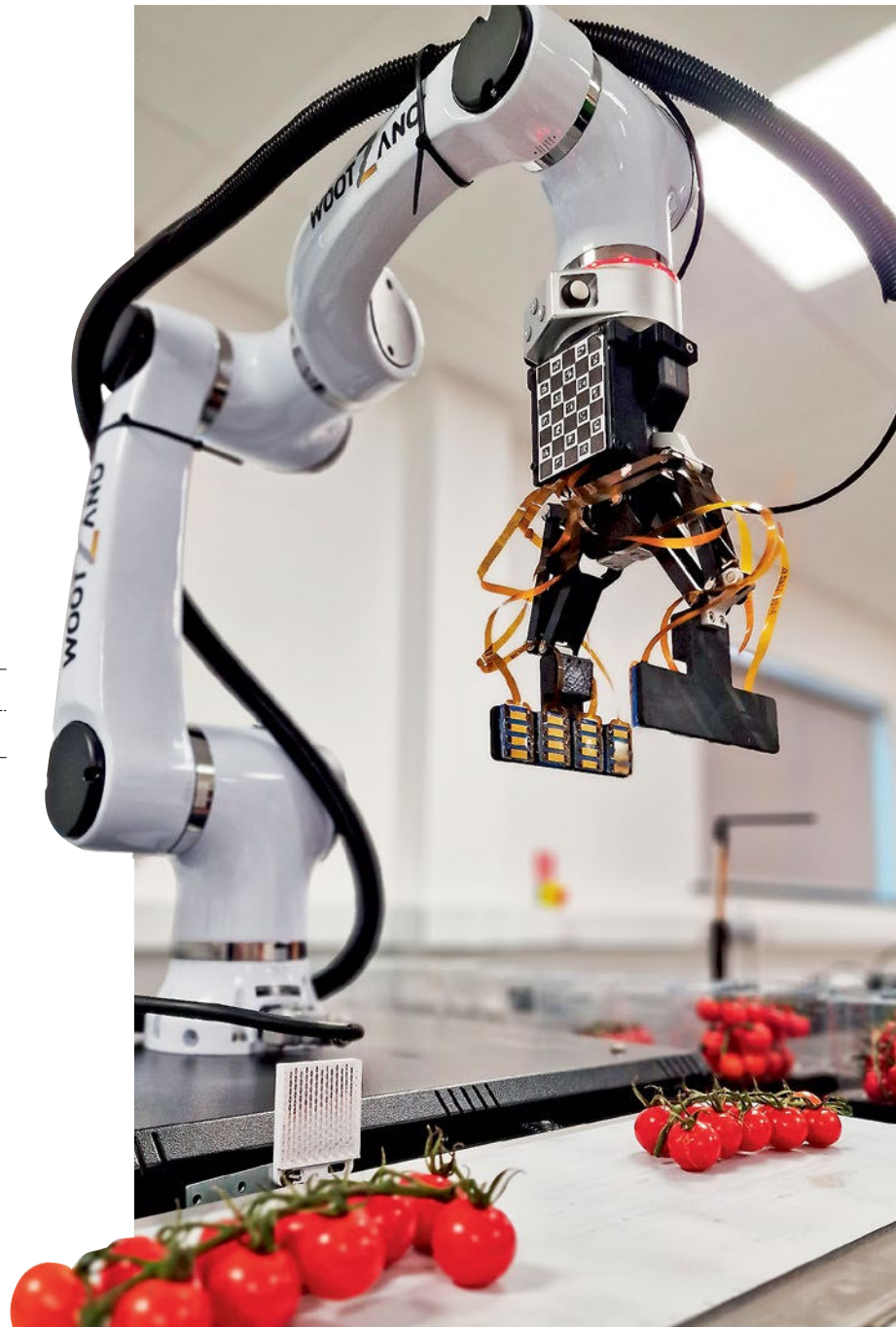
As the Investment Day at FII8 in Riyadh approaches, it is evident that companies like Wootzano are leading the charge in revolutionizing industries through innovation and entrepreneurship. Dr. Syed's journey with Wootzano is a testament to the power of visionary leadership, cutting-edge technology, and a relentless drive to solve real-world problems. With its focus on addressing labor shortages, improving sustainability, and making automation accessible, Wootzano is poised to continue shaping the future of the fresh produce industry for years to come. ■



The team is encouraged to experiment, innovate, and learn from failures, which has led to groundbreaking solutions like Avarai. This culture of innovation is what drives Wootzano's continued growth and success in an increasingly competitive landscape."

DR. ATIF SYED

Wootzano





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**FII-I has three pillars to deliver its mission:
THINK, ACT and XCHANGE**



1 FII-I THINK

Identify societal challenges and current inhibitors. Curate the brightest ideas to address societal issues



2 FII-I ACT

Catalyze innovation and initiatives by mobilizing partners and resources



3 FII-I XCHANGE

Create platforms for live discussions on the future of humanity. Share knowledge, stories and publications with different stakeholders

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Upcoming Events

FII8

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