

JANUARY 2024

inside zhero

IoT FOR THE
PLANET
Change is inevitable

RAJ'S TAKE
ON IoT
Smart buildings are
the future



Message from Izak

Welcome to this year's first edition of Inside Zhero and wishing everybody a belated Happy New Year!

This month, we're diving into the wonderful world of IoT and how we can use the technology to become more sustainable.

A handwritten signature in black ink, appearing to read 'Izak Oosthuizen'.

IZAK OOSTHUIZEN
Chief Executive Officer,
Bestselling Author



In this issue

Our feature “IoT for the Planet” shows us why IoT is a catalyst for a sustainable and productive future.

Businesses leveraging IoT can see a 70% boost in productivity.

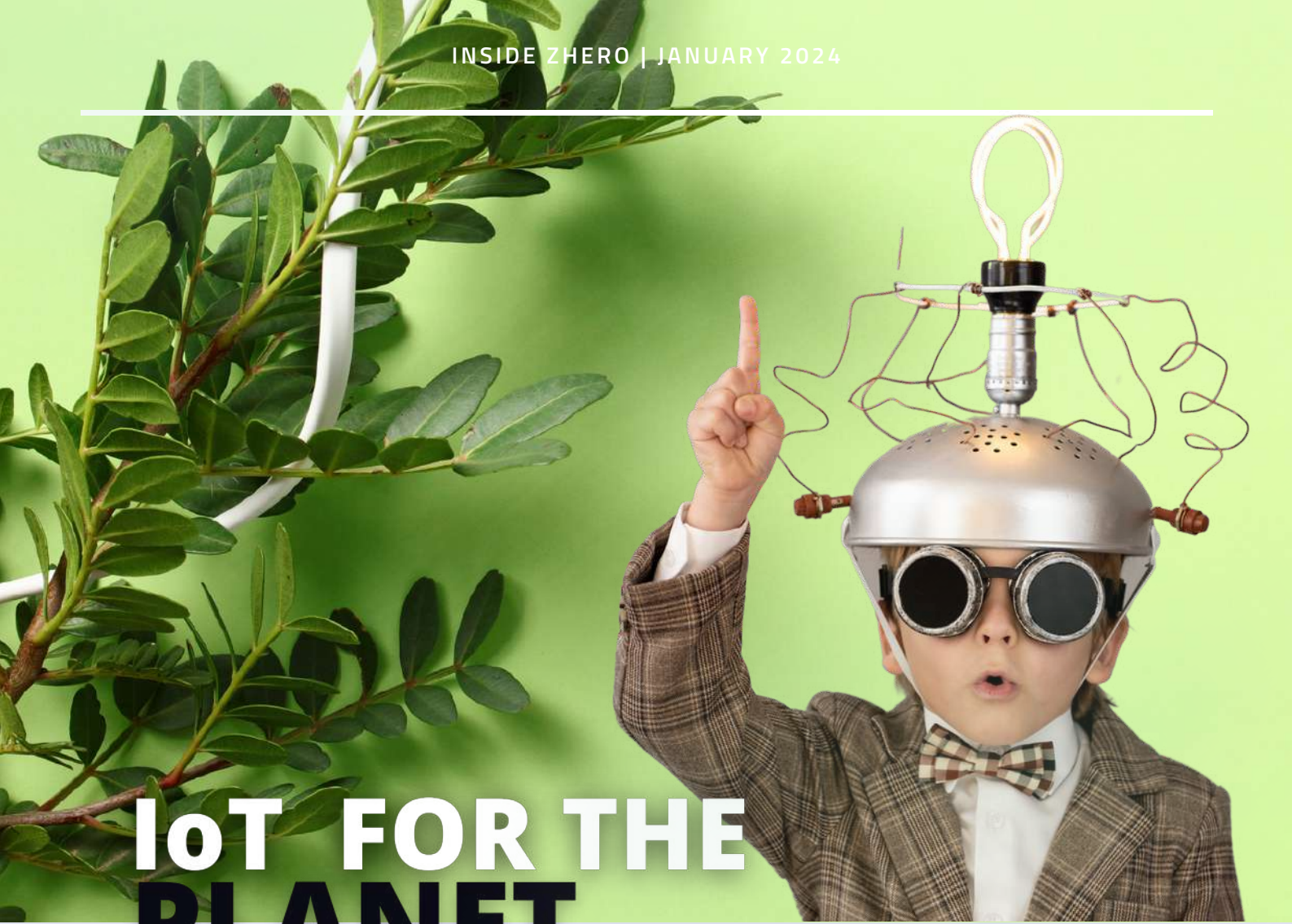
“SMEs are starting to buy into IoT technology. In 2021, 70% of UK small businesses were already looking into using IoT platforms to optimise operations, improve customer experience, and monitor their inventory.”

Izak Oosthuizen

Zhero Founder and CEO,
Bestselling author



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IoT FOR THE PLANET

21st century tech

In case you've got a short memory, the Internet of Things (IoT) is an interconnected network of physical objects, or "things." These "things" are equipped with sensors, software, and technologies to allow communication and data exchange with other devices and systems via the Internet. IoT has been called a pivotal technology of the 21st century. When we bring together affordable computing, cloud storage, big data, analytics, and mobile technology, everyday devices can share info without needing a ton of human input. IoT lets connected objects interact in a super-connected world where the physical and digital collaborate smoothly.

IoT everywhere

You probably don't realise it but IoT is everywhere. Each home in the UK has more than 10 IoT devices making a massive total of almost 290 million "things" in the country. Smartphones, laptops, smart TVs, baby monitors, electric vehicles (EVs), washing machines, toasters - you name it - almost anything connected to the internet is considered an IoT device. Plus, we've got Siri and Alexa.

Smart thermostats can understand your daily schedule and automatically regulate room temperature, saving energy savings and decreasing utility expenses. Meanwhile, wearable fitness trackers can track vital metrics like heart rate, sleep cycles, and workout patterns, offering valuable information about your general health and wellness.



global growth of IoT

Although the term "The Internet of Things" was not used until 1999, the first IoT device was invented in 1982, a vending machine that lit up every time somebody bought a Coke. Strictly, this was not an IoT device as the internet was only born a year later. We've come a long way since self-illuminating Coke machines.

By 2010, there were 800 million IoT devices on the planet - 9% of all the devices in the world. And the global growth of IoT speaks for itself:

- 2015 - 3.6 billion (27% of all devices)
- 2020 - 11.7 billion (54% of all devices)
- 2023 - 19.8 billion (66% of all devices)

Predictions are there will be over 29 billion IoT devices by 2030. The consumer market will dominate with 17 billion, most of which will be internet and media devices like smartphones.



IoT ecosystem

Any IoT ecosystem has:

- **Devices** - IoT devices can collect data or perform specific actions based on the received data.
- **Connectivity** - IoT relies on Wi-Fi, Bluetooth, or cellular networks, to transmit and receive data efficiently.
- **Data** - IoT devices capture data using sensors which is then transmitted to cloud storage for processing and analysis.
- **Applications** - Data analytics applications and machine learning algorithms process and interpret the collected data.

When we integrate IoT into any business process, all these components are essential.

IoT in business

IoT enables organisations to ditch old-fashioned manual asset-tracking systems and adopt automated sensors. IoT also has the potential to take customer satisfaction to the next level by providing advanced features and personalised experiences. In a nutshell, businesses benefit from IoT through automation and connectivity. These enable:

- optimal asset utilisation
- getting invaluable insights from data
- embracing increased mobility and agility
- boosting productivity by 70%
- increasing efficiency
- improving customer shopping experience

IoT solutions help companies of all sizes, including SMEs, offer more products and better quality than their rivals, all without breaking the bank. Going for smart IoT solutions makes a business more competitive and attractive as a potential partner. As a consequence of IoT initiatives, 36% of companies are considering new directions in their business strategies.

IoT in fintech

The role of IoT in FinTech promises to shake things up for the banking industry, how we bank, pay for things and handle our money. Financial technology or FinTech uses innovative technologies like IoT to enhance and automate the provision of financial services and how we use them. This means we have entered a new era of digital currency, simplifying money transfers and sidelining the need for physical cash. IoT in FinTech accelerates operations, refines service delivery, and improves our overall customer experiences.



catalyst for change

Some say that IoT is a catalyst for sustainability. The ongoing progress in IoT has transcended its initial focus on reducing energy consumption and carbon emissions. IoT has expanded its scope into critical areas like water conservation, waste reduction, and the promotion of renewable energy usage. Here are just a few ways that IoT is doing its greener good for sustainability:

- **Smart buildings** – IoT building management systems optimise energy use, reduce waste, and enhance occupant comfort.
- **Smart electrical grids** - Using IoT technology, we can develop smart grids that better manage electricity distribution and consumption.
- **Smart public transport** - IoT enables real-time tracking, predictive maintenance, and dynamic route optimisation, thereby reducing fuel consumption and increasing efficiency.
- **Smart healthcare** – Admissions, physical appointments and hospital energy consumption are reduced when IoT is used for remote patient monitoring, telemedicine, and care coordination.
- **Remote monitoring** – Companies engaging in IoT for remote monitoring of assets and operations experience better efficiency and cost-savings.
- **Supply chain optimisation** – IoT improves supply chain visibility and traceability, helps identify inefficiencies, and reduces waste.
- **Waste management** – With an estimated 3.4 billion tons of annual waste by 2050, IoT can solve waste and trash management problems by giving access to real-time data.

the google nest

Google Nest is a range of smart home products including smart speakers, smart displays, streaming devices, thermostats, smoke detectors, routers and security systems. Speakers start at £49, a Nest Cam with a floodlight costs £270, and a subscription to the home-monitoring package, Nest Aware is £6 a month and up. In terms of sustainability, Google's Nest makes a substantial impact on the Greentech industry with its programmable, Wi-Fi-enabled thermostats. The Nest Thermostat has saved billions of kilowatt hours of energy in millions of households worldwide since 2011.

making IoT sustainable

The rapid expansion of the IoT device count is escalating the demand for device manufacturers to improve the power efficiency of the devices and increase their lifespan. Here are some of the ways IoT devices can be designed and used to promote our green world:

- **Solar harvesting** – Using small solar panels to power remote IoT devices.
- **Green cloud** – Using a data centre energy consumption baseline to optimise cloud energy and resource consumption.
- **Settings optimisation** – Use IoT device settings to reduce energy usage and make them more responsive to your needs.
- **Firmware updates** – These improve the functionality, security, and efficiency of your IoT devices.
- **Responsible recycling** – When IoT devices reach end-of-life, they must be disposed of with minimal environmental impact and according to the local regulations and guidelines.

IoT and cybersecurity

Security was not at the forefront of designer's minds when they developed IoT devices. This has led to many challenges that can result in catastrophic situations if not kept in check. Unlike other technological solutions, there is a lack of well-established standards and regulations governing IoT security. Also, many people lack an understanding of the risks associated with IoT systems and remain unaware of the complexity and extent of IoT security challenges. Here are a few of the main IoT cybersecurity concerns that perplex many of us:

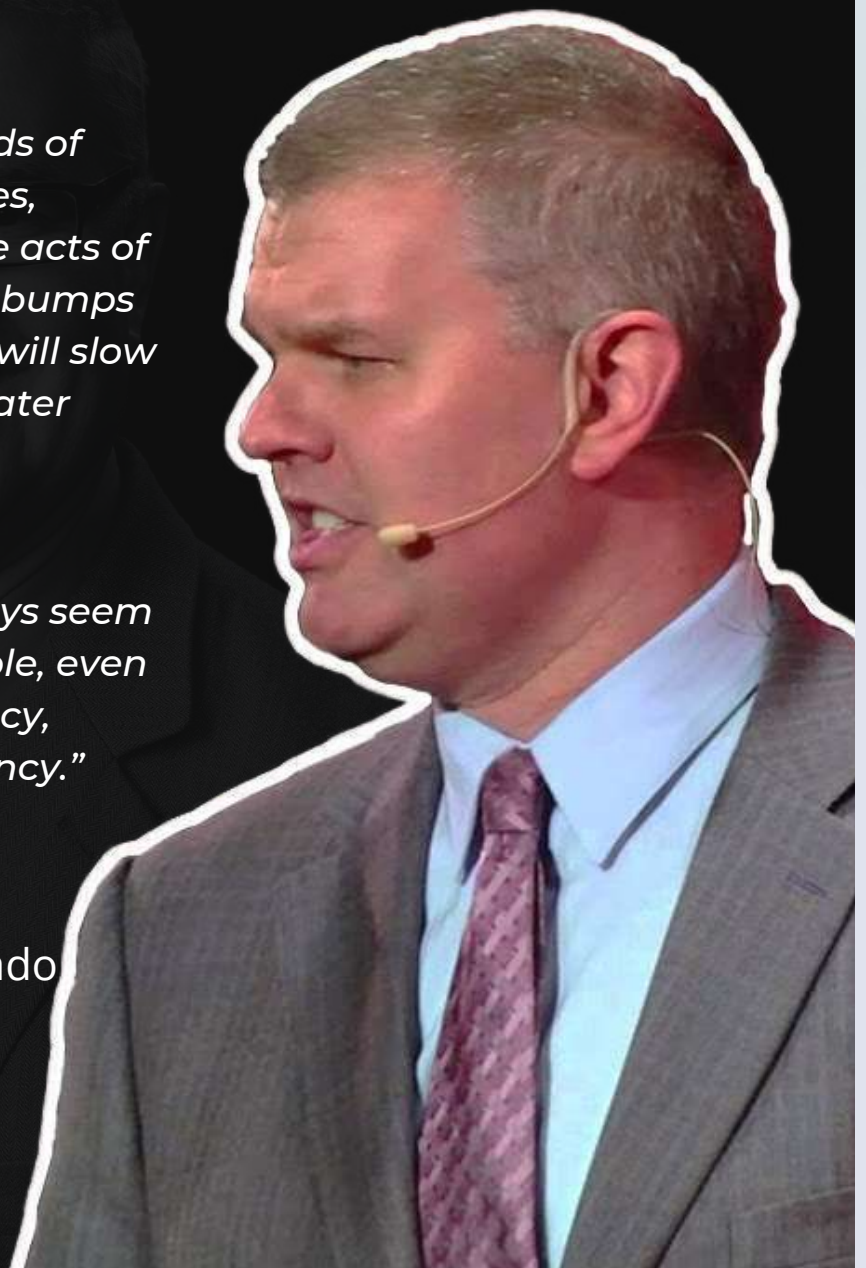
- **Insecure Passwords** - Many IoT devices come with default passwords that users often neglect to change, providing cybercriminals with effortless access.
- **Inadequate Testing** - Developers don't do thorough vulnerability testing, meaning that weaknesses within IoT systems aren't identified.
- **Unpatched vulnerabilities** - Numerous IoT devices have unpatched vulnerabilities because patches aren't available or there are challenges in accessing and installing them.
- **Data volume** - The huge amount of data generated by IoT devices makes data oversight, management, and protection very challenging.
- **Limited security integration** - Because of the variety and scale of IoT devices, integrating them into security systems can sometimes be impossible.
- **Lack of visibility** - In many businesses, IoT devices are often deployed without the knowledge of IT departments, making it impossible to have an accurate inventory of what needs to be protected and monitored.

Dr Scott McLeod, a professor at the University of Colorado also believes that when it comes to IoT, individuals will opt for pleasure and convenience first and forget about the pain of being hacked which can easily follow.

“There will be all kinds of hiccups, horror stories, accidents, deliberate acts of sabotage and other bumps along the road that will slow but not stop our greater connectivity.

Convenience and empowerment always seem to win for most people, even at some loss of privacy, control or transparency.”

Dr Scott McLeod
University of Colorado



CRUSH IT CHAOS



Tune in here:



zhero | PODCAST

NEW GEN SOCIAL RESPONSIBILITY

On 10 January, Zhero had a great time attending the 5th National Symposium on Developing Socially Responsible Professionals at City, University of London. The symposium gathered together experts and stakeholders from academia, industry, charities, and government organisations. Along with some awesome keynote presentations, including one by Prof. Raj entitled "Could the FinTech sector deliver Social Value in the UK?", compelling debates focused on developing the next generation of socially responsible professionals (SRP).

Besides Raj's revelations on the impact of IoT on socially responsible FinTech, Professor David Leslie, Director of Ethics and Responsible Innovation Research at The Alan Turing Institute, gave the lowdown on Generative AI and the future of the professions. The day, hosted by Accenture and UK Engineers Without Borders, was a valuable and insightful journey down the roads of diversity, equality, global sustainability, circular economies, privacy, identity and data protection, and corporate social responsibility.





University of
Business, practice
and professions.

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5th National Symposium
**Developing Socially
Responsible
Professionals (SRP)**

10th January 2024

Welcome



Raj on IoT

At the symposium, we caught up with Raj and asked him a few questions about IoT, social responsibility and sustainability. Here are his wise words:

What is the role of IoT in sustainability?

Raj - Put simply, we can look at IoT as using sensors to collect data. We then analyse the data to see where we can reduce energy consumption and make our use of energy efficient.

What is the main benefit of using IoT for sustainability?

Raj - IoT lets us supply energy Just-in-Time (JIT). Just like JIT in supply chains, providing energy JIT saves on resources and reduces waste.

Are there any challenges?

Raj – I think the biggest challenge for IoT in sustainability is that enormous amounts of data are generated which are then processed in data centres. This uses a lot of energy.

Where is IoT making its greatest impact on sustainability?

Raj – In smart buildings and homes. At City, we use a JIT approach to supply lighting and heating and this has made a huge difference to our gas and electricity bills.

What about the sustainability of IoT devices?

Raj – Historically, these devices weren't designed with energy saving in mind. I think that sustainability needs to start at the design stages of devices so that they are more efficient, and operate on renewable energy sources, like solar power. They also need to have a longer life so we reduce recycling and waste.

Besides his active role as Zhero's Head of R&D, Raj continues to work closely with many tech start-ups by translating his research into commercial products to make a societal impact through technology.



**sustainable
city**

In 2022, City, University of London received a first-class award from the People & Planet University League, a UK-wide performance indicator on environmental and social sustainability criteria.

Meet the team



Leandro Lee

SERVICE DESK ENGINEER

Hi Leandro! What made you realise you want to go into the IT industry? ✓✓

I used to be an ex-professional rugby player. While I was playing I was injured and realised I needed something to fall back on so I pursued IT.

What's your most-used productivity tool? ✓✓

That would be my emails and my phone. Basically, from my phone, I can do anything.

How would you describe yourself? ✓✓

I'm calm, reserved and patient. Also, I always try to be positive.

What do you enjoy the most about your role? ✓✓

I enjoy assisting clients and users. Also assisting with whoever needs assistance. At the end of the day, I just love what I do.

Do you have any hidden talents or hobbies? ✓✓

I enjoy working with wood and DIY. I enjoy going out in nature to clear my mind and meditate.

What is your favourite movie or TV show? ✓✓

I enjoy Top Gear and of late I've been into Tulsa King. My favourite movie is Troy.



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