

**CIONET UK COMMUNITY
PROGRAMME 2023**

EMERGING TECHNOLOGIES

GRASPING THE OPPORTUNITIES AHEAD

Roger Camrass
CIONET UK

CIONET UK Community Programme 2023

Emerging Technologies: Grasping the opportunities ahead

This article is written by Roger Camrass, Director of Research for CIONET International, and is based on the first UK community programme event of 2023, which was held at the Institute of Directors in London and attended by 140 digital leaders.



Prelude to the event

As business leaders, we recognise that just four technologies – cloud, mobility, social media, big data – have created immense structural changes to our social and working habits during the past two decades. These technologies have also fuelled the development of Big Tech, a small number of innovative and fast-moving digital behemoths that now dominate global equity markets. But if you think the scale of that transformation has been remarkable, it's our contention that 'you ain't seen nothing yet!'

At CIONET, we anticipate a second wave of technological advances during the coming decade that will create even more fundamental change. This wave will include the continued rise of quantum and edge computing, artificial intelligence (AI) and machine learning (ML), the Internet of Things, blockchain, 3D printing, and augmented and virtual reality. As this second wave approaches our shores, the key question facing all business leaders is how to act on these new tech-led opportunities? At our first community event of 2023, we discussed:

- What business problems are these second-wave technologies likely to address?
- How do we experiment with such techniques and confirm their commercial value?
- What is the role of CIOs and IT organisations in the orchestration of this technology?

Session One: A Master Class by Cindy Hoots, Global CDIO of AstraZeneca

As Chief Digital Officer & CIO at AstraZeneca, Cindy leads the company's digital strategy. Roger Camrass asked her five questions during the keynote session:

1. Looking back over your recent career as a global CIO, which technologies have been most influential in transforming your businesses (e.g. mobile, social, cloud, data analytics)?

The move to cloud has been the most significant advancement in both technical and business terms, offering the flexibility and agility to respond to world events, such as the discovery of new vaccines during the recent coronavirus pandemic. Today, we can switch on compute capacity in seconds that would have taken months to organise historically. Cloud adoption varies across sectors, with consumer goods products approaching 70%, but others, such as military & defense, remaining largely on-premises.

Data analytics has become increasingly influential during the past decade, providing senior managers with crucial insights into research and business performance. However, at the same time as these advance, it's also true to say that no sector is yet in a good

place. A great deal of effort is now being directed to building solid data foundations for modern businesses that will enable powerful new tools, such as AI, to be deployed.

2. Given the challenges facing healthcare organisations across the globe, how could new technologies open up fresh opportunities across business and society?

Until recently, it has taken pharma companies 10 years to bring a new drug to market. Modern technologies have helped compress this timespan. A large amount of the traditional effort associated to testing drugs in 'wet labs' can now be completed by virtual computations, assisted by AI. Given that AstraZeneca is focused on life-saving drugs, a significant reduction in the time it takes to bring new drugs to market is a game changer.



In the case of the COVID-19 vaccine, we were fortunate to collaborate with the University of Oxford, which is an institution that was already using advanced technologies in its drug discovery processes. The experience of developing the vaccine highlighted the importance of active collaboration between pharma companies and academia. These ecosystem-led approaches can accelerate critical activities, such as drug discovery. It should also be noted that collaboration also boosts effectiveness across all areas of technology leadership, as demonstrated by the success of CIONET's peer-to-peer network.

3. Which emerging technologies do you believe will support a radical change in the way healthcare is delivered in the coming decade?

We see AI as our biggest bet today, as it is now at the cusp of full-scale commercialisation. We would also highlight advances in image processing that enable medical practitioners to analyse multiple scans and identify early signs of illness, including the early detection of cancer.

However, these data-led advances also raise ethical questions that the CIO community must strive to answer. AstraZeneca has worked closely with EY to understand the ethical implications of AI and to develop governance frameworks that address potential issues. Trust is a critical factor in any discussion about the ethics of AI. CIOs and their C-suite peers must think about how to build trust with external parties. CIOs can help take the lead in these discussions.

Looking beyond the two-to-five-year timeframe, we believe immersive technologies will play a transformational role in healthcare and other sectors. We see a new era emerging, where the fast-developing capabilities of augmented and virtual reality could enable us to be in two places at once. This blending of physical and virtual environments would be a game-changer for business and society.

My personal advice to the CIO community is to be more entrepreneurial. The expanding pipeline of powerful new technologies means now is the perfect time to innovate. Perhaps it is time for us to be 'Chief Innovation Officers'?





4. How does an organisation like AstraZeneca seek to monitor and deploy emerging technologies, especially in their nascent phases?

AstraZeneca employs a carefully orchestrated process to monitor, apply and scale new technologies across its global businesses. We have technology scouts who identify potential new technologies to be incorporated into our enterprise architecture. These technologies are then added to our portfolio and offered to C-suite partners as potential solutions to ongoing business problems and routes to new opportunities. For example, AI has been introduced into clinical trials to inform patients about the processes that they will go through. This insight helps reduce stress and improve outcomes.

5. What role do you believe the CIO and IT organisation should play in harnessing the power of emerging technologies across the healthcare sector?

I would advise aspiring digital leaders to be curious about global developments, both technical and economic. Job rotations of between 18 and 36 months can foster curiosity, especially when they take place across countries and regions. We need to recognise that technology has 'become the business' and digital leaders stand at the forefront of change.

One of our obligations as CIOs is to ensure the C-suite is fully informed about technological possibilities. Many line-of-business executives have risen through the ranks without the need to have a deep understanding of technology. This is an area where we can make a big difference; mentorship must be a key component of our roles as digital leaders.

Session Two: Panel discussion

Five distinguished panellists were asked to comment on emerging technologies and their implications for the CIO community and the organisations they serve:

- **Catriona Campbell**, Chief Technology and Information Officer of EY UK & I
- **David Smith**, Chief Executive of Global Futures and Foresight
- **Kevin Kennedy**, Senior Vice President of Products at Vectra AI
- **Jennifer Bisceglie**, Founder and Chief Executive Officer of Interos Inc
- **Brad Mallard**, Chief Technology Officer at Version 1

Here is a summary of the topics that were discussed by the Panel.

Welcome to the Intelligent Era

David Smith said we are entering a new Intelligent Era of interconnected devices. This machine-to-machine network of more than one trillion intelligent devices will be capable of predicting events and taking action. In 2012, we generated one zettabyte of data annually. By 2025, this total is likely to exceed 175 zettabytes due to an explosion in the number of intelligent devices. This data explosion means we will need new tools and platforms to exploit our ever-growing information resources.

Brad Mallard described the fast-growing network of low-Earth orbit satellites (LEOs) that will offer high-definition connectivity to every member of the world's population. Today, five billion people have access to the internet; LEOs will help ensure the remaining 40% are also included. High-definition connectivity will foster new business-to-business applications in sectors such as utilities, agriculture and logistics. With over 100,000 satellites likely to enter orbit by 2030, there is hope that these connected technologies will allow innovators to generate solutions to intractable global problems, such as climate change and world hunger.

Improving risk management and operational resilience

Jennifer Bisceglie said the uninterrupted supply of goods and services is simply table stakes for successful supply chain management. Delivering this minimum acceptable offering requires real-time oversight of the complex ecosystems that comprise modern physical and digital supply chains. Jennifer anticipates that pioneering developments in AI and ML will mean that we will be able to engineer self-healing supply chains within a few years.

Kevin Kennedy referred to increasing concerns about cyber risk. The ever-growing rise in connectivity means potential attack surfaces continue to grow, especially across cloudbased services. However, the monitoring of cyber activity is a complex and mundane task. The challenging and repetitive nature of this work has led to an exodus of cyber workers in recent years. Applied intelligence could automate some of the repetitive tasks of cybersecurity, leaving staff to focus on creative, value-adding activities.

Kevin believes the rise of quantum computing is both a challenge and an opportunity. While quantum will help us to protect future information assets, the technology could

also be used to break modern encryption standards. Chinese organisations are already storing vital commercial transactional data in anticipation of this break occurring in as little as five years. The continued rise of intellectual property theft by bad actors means data protection will continue to be a big concern for commerce and government.

An expanded role for the CIO

Catriona Campbell said she sees the CIO as the orchestrator of tomorrow's complex ecosystems. There are several dimensions to this expanded role, including protecting customer and employee privacy in the emerging era of AI. The EU is already introducing [The AI Act](#) to help regulate the use of new and powerful technologies, such as ML. The UK will need to follow this initiative if it is to do business with its EU partners.

While only 3% of CIOs occupied board positions in 2003, the figure today is close to 40%. David Smith believes CIOs will continue to move away from back-office responsibilities and towards front-line activities and then beyond into the external environment. Jennifer Bisceglie suggests CIOs should be curious and entrepreneurial in their day-to-day tasks. In the future, digital leaders will spend more of their time informing the rest of the C-suite about technology and business developments.

Conclusion: Three big bets for the future

Roger Camrass thanked the speakers for their valuable insights and the audience for their enthusiastic participation in the event. He concluded by summing up CIONET's take on the role of emerging technologies, which is presented in the recent paper *'Emerging Technologies – CIONET is placing three big bets for the future'*. These bets are:

1. AI and ML are evolving quickly into consumer applications that will transform every aspect of our lives
2. Immersive technologies, such as augmented and virtual reality, will give us the opportunity to be in two places at once
3. Web 3.0 and the birth of autonomous decentralised organisations will transform the economic landscape into the new structures of tomorrow, see our paper *'Back to the Future – A radical manifesto for digital leaders'*





Roger Camrass
Lead researcher

A pioneer of today's Internet as an ARPA research fellow at MIT in the seventies, Roger has spent over forty five years helping corporations harness the power of new technologies such as cloud, mobile communications, e-commerce, voice recognition and satellite. He was a partner at EY responsible for e-commerce during the dot.com boom. He is a graduate of Cambridge University and MIT, and a visiting professor at the University of Surrey.

See rogercamrass.com

