

ACE ANNUAL REVIEW 2019/20

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Richard Alcock CBE, OSCT Chief Operating Officer

The Home Office's Accelerated Capability Environment was established to respond to unpredictable and fast-moving threats and challenges. So it is fitting that as it begins its fourth year, ACE has been making vital contributions to the UK's response to the coronavirus pandemic. It serves to highlight how widely ACE's approach can be applied to deliver impact at pace through industry-driven innovation.

ACE continues to deliver well across a broad spectrum of ambitious government public safety and security policy initiatives. Its innovative approach is enabling more rapid delivery in partnership with industry. It is helping transform public service delivery through science, technology and improved exploitation of data.

In these times of exponential technological change, innovation isn't an optional extra – it's an obligation. It is the only meaningful way we will meet tomorrow's challenges, whether they are global pandemics, combatting technology-enabled crime or countering the threat of terrorism. And it is the way we will achieve the greatest efficiencies in doing so.

Innovation is so much more than the clever solutions that are developed to meet the pressing needs of mission challenges. It is about the creation of an ecosystem that challenges the ways we think about and approach problems, the commercial and contractual arrangements around developing solutions, ensuring diversity of suppliers, and seeking ways of working that challenge norms and provide the fastest and most cost-effective routes to delivery.

These are all attributes of the ACE model. They are what makes ACE an enabler, not only for mission customers but also for other organisations within the government's extensive and enviable innovation ecosystem. The ACE team can help any project, programme or organisation deliver with greater impact and at greater pace.

I am very proud about what ACE has achieved to date and excited by the work they will continue to do to improve public service delivery.



ACE continues to deliver well across a broad spectrum of ambitious government public safety and security policy initiatives.

Richard Alcock

Foreword by AC Martin Hewitt

Chair National Police Chiefs' Council & co-author of the National Policing Digital Strategy 2020 – 2030

Nobody can be in any doubt about the urgent need for policing to transform itself in order to respond effectively to a world of unpredictability and exponential change. Digital disruption has had a profound impact on the way people live their lives. It has up-ended entire industries and remodelled economies.

Policing faces these same disruptive forces. As the *National Policing Digital Strategy 2020 – 2030* acknowledges, policing does not operate in a vacuum. It needs to respond to the new and ever-changing threats presented by technology and a data-driven society.

The challenges we face in doing so are significant and complex, but they are not insurmountable. And we are not tackling them from a standing start and, in most cases, we do not have to build from scratch. Organisations such as ACE offer proven vehicles to drive ideas into frontline impact at the pace demanded by the fast-changing world around us.

Through its Vivace industry community, ACE brings the private sector and policing together at that frontline mission level to address the real challenges officers face. It brings new ways of working and thinking about problems to a service that has been rigid in structure and traditional in approach.

Digital technologies enable entirely new types of crime, provide new tools to offenders, and open up new opportunities to target and harm the vulnerable. These same technologies can also enable new ways to deliver policing, provide new tools for fighting crime, and open up new opportunities to bring offenders to justice and to protect the public.

Criminals have always been early adopters of emerging technology, so the police service cannot afford to be any less innovative. And we can't do that without working with the private sector in the sort of ways that ACE makes possible.

There are other examples where police forces and national programmes are innovating to deliver real impact. We need to celebrate these and do everything we can to learn from them, share knowledge and make them the norm, not the exception.

But as much as we need to embrace technology and innovation, we need to change the way we lead and behave.

The need for such transformation is clear and the strategy to achieve it is in place.

Now it is time to turn the thinking into doing.



Criminals have always been early adopters of emerging technology, so the police service cannot afford to be any less innovative.

Martin Hewitt



**POSITIVE DISRUPTION
TO DRIVE INNOVATION**

Introduction by Toby Jones Head of ACE

One of the founding principles of ACE was for it to be a force for positive disruption. To challenge accepted norms and solve problems in ways that are novel, faster and more cost effective than those the public sector has become used to.

The past year has demonstrated how relevant and applicable our innovative approach can be to diverse mission problems that demand meaningful impact delivered at pace.

Because, as much as we are immersed in technology and data, we consider innovation in a much broader context.

For ACE, innovation means the most effective way to go from initial problem to making something happen. And that has more to do with people than just technology and data abilities.

Human behaviours catalyse innovation – the way we shape the problem, develop the best tools, and craft the solution. It's about assembling high performing teams from within our own ACE core team and across our multi-disciplinary Vivace community.

Our Maritime Security commission initially focused on supporting ministers' position on the implications of Brexit on safeguarding our territorial waters but within a few months had evolved into building a business case for a significant advance in governance and technical situational awareness capabilities.

Working with Derbyshire Police and the National Crime Agency, we have developed a platform for ingesting and analysing data shared by British businesses on the constant barrage of cyber attack attempts they face every day. It makes real the prospect of a co-ordinated, nationwide, data-driven police response to a problem that costs the UK economy £30billion a year.

These are just two of many examples of critically important challenges that have been brought to ACE because of its novel model for addressing mission problems.

At the heart of this model is our focus on making work real and tangible at the earliest opportunity through proofs of concepts, MVPs and demonstrators that can be quickly spun up into pilots.

Bringing proposed solutions to life early on makes them real for customers and other stakeholders, removing uncertainty about what is being done and why. It accelerates the shaping, development and delivery. It is about going from idea to impact via the shortest and most effective route possible.

An independent review by Massachusetts Institute of Technology (MIT) last year highlighted the effectiveness of this model, with a recommendation it be applied more widely across government. ACE was also awarded the Institute for Collaborative Working's national award for innovation.

Of course, such recognition is welcome, but the bigger point is the validation from industry and academic bodies that see the value and transformational potential of our disruptive approach.

ACE is now entering a new phase in its growth and development, and in the coming year I'm looking forward to mainstreaming that approach across the public sector and beyond.



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Toby Jones

The year in review

The past financial year has seen ACE consolidate and grow its model for delivering innovative solutions for digital and data challenges across law enforcement and public safety. Increasingly, it has been able to apply its approach to a wider range of mission challenges for a broader set of public sector customers.

In addition to continued extensive work in areas of online harms and child sexual exploitation, ACE commissions have covered cybercrime, cybersecurity, maritime border security, modern slavery and human trafficking, desistance and disengagement of offenders from crime, risk profiling of prisoners prior to release, critical national infrastructure threats, and implementing new data-oriented investigatory powers.

The ACE model was recognised by the Institute for Collaborative Working with its annual award for innovation in December 2019. It was also the subject of independent research by Massachusetts Institute of Technology (MIT), comparing it with MIT's Sloan School's model for successful innovation. Its report concluded that ACE represented an effective co-creation model which should be replicated across the UK government.

In addition to addressing mission challenges through commissions, the ACE model has provided effective means to bring the expertise of its core team and wider Vivace community to bear on strategic policy development. A noteworthy example was ACE's work with the government's Office for Artificial Intelligence to trial the Organisation for Economic Co-operation and Development (OECD) guidelines for ethical procurement of AI.



Another was at the conclusion of Sir Craig Mackey's Serious and Organised Crime Review, when ACE hosted a workshop between the private sector, law enforcement and members of the review team. The workshop appraised the review's candidate findings before publication, qualified industry's perspective and sought opportunities for increased collaboration between law enforcement and the private sector in tackling serious and organised crime.

ACE is also leading a new collaboration between the Information Commissioner's Office and the private sector to develop recommended practice – compliant with data protection legislation – for when collaborative development of solutions relies on processing sensitive law enforcement data.

Following a visit to ACE in August 2019 by the Metropolitan Police Commissioner Cressida Dick, Deputy Commissioner Sir Stephen House, and Director of Digital Policing Angus McCallum, ACE has built a training platform to assist Met officers develop and share new techniques to exploit data in investigations.

ACE also re-uses its internal infrastructure to provide services to organisations within the public sector, branded to delineate them from commissions.

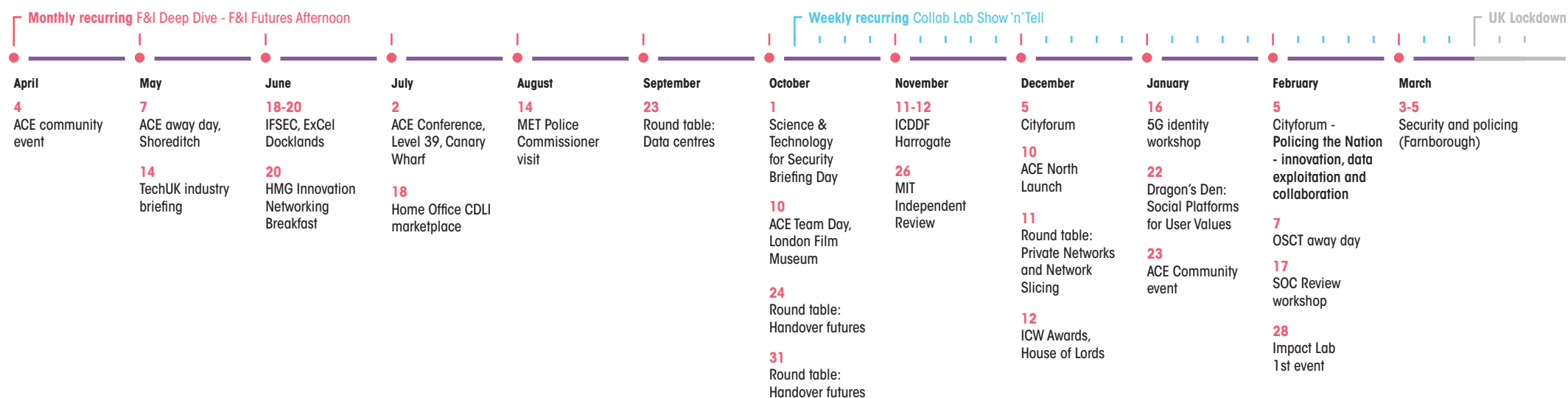
Collab Lab provides the facilities and services for people drawn from diverse organisations to work together on joint initiatives in a way that public sector infrastructure does not readily support, while developing their own understanding of the personal and organisational qualities needed for successful collaboration. Collab Lab hosts the nascent National Security Technology and Innovation Exchange (NSTIx), whose team are drawn from a dozen plus government departments and national security agencies.

ACE conceived Impact Lab as a new way to rapidly use private sector expertise to overcome barriers which data can present to criminal justice and public safety. It provides industry participants with access to real operational data from closed cases to ignite innovation.

Underpinning the way ACE works and facilitates collaboration is the secure IT infrastructure that makes possible rapid onboarding, Bring Your Own Device

(BYOD), and use of sensitive live data within the unique PodDev development environment. These tools and ways of working have enabled ACE to continue operating almost seamlessly through coronavirus restrictions. The following pages feature case studies highlighting some of ACE's work from the past year.

The year in review timeline



CASE STUDY

Accelerating data exploitation capabilities through collaboration

Data Investigation and Collaboration Environment (DICE)

ACE developed the Data Investigation and Collaboration Environment (DICE) to enhance the sharing of knowledge and tradecraft for the better exploitation of communications data in investigations. DICE enables the development of advanced techniques that deliver real impact to frontline policing.

Building on the work of a previous ACE commission which helped design a blueprint for maximising benefits from data sources, DICE brought this another step closer to reality by creating a cloud-based collaboration environment which can be accessed remotely.

A laptop-based demonstrator was built initially, by a rainbow team of four companies from ACE's Vivace industry community, which was then transitioned on to secure cloud-based infrastructure.

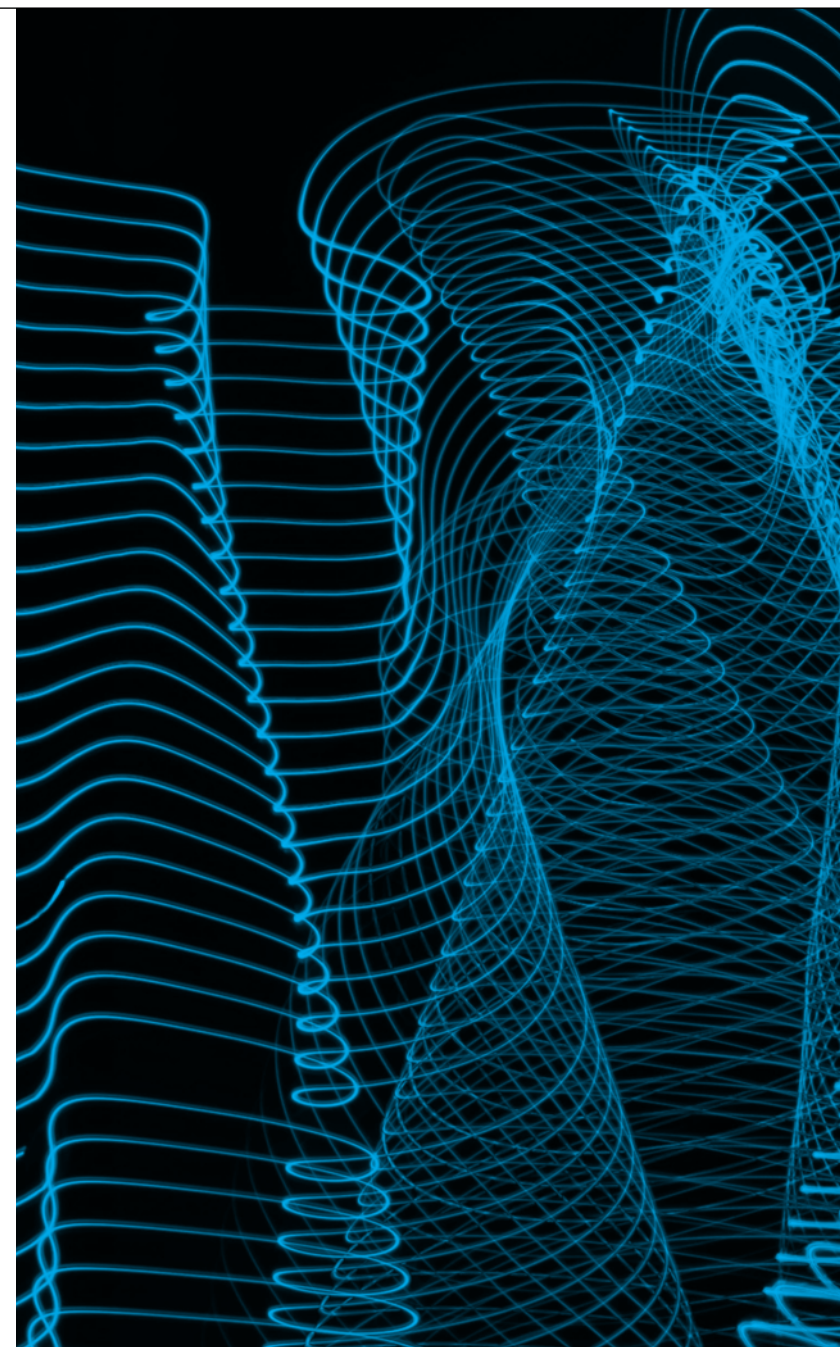
This created an innovation environment for the law enforcement community that can be used to explore future opportunities in multi-source data exploitation, as well as non-technical aspects such as personal compliance monitoring.

User engagement will drive further refinements to the platform, and the demonstrator also allows for additional functionality to be added in a safe test environment.

Where people are already doing good work in this area in isolation, DICE provides them with community and infrastructure that allows them to work in a more joined-up way.

This commission provided the customer with a potential design for an initial scalable and sustainable operational collaboration environment which can be progressed for further development and procurement.

This capability will also help promote and share common methods and standards across the wider data analysis landscape and could potentially be expanded to industry in the future, enabling more industry innovation and accelerating new product development.



CASE STUDY

Creating a safer internet for children

Verification of Children Online (VoCO)

ACE was commissioned by GCHQ and supported by DCMS and the Home Office, to run a cross-sector research project to provide insights to Government on how children could be kept safer online. By bringing together experts from across the spectrum it was able to stimulate innovation and collaboration.

In partnership with its Vivace industry community and GCHQ's child sexual exploitation and abuse (CSEA) team, ACE created a cross-sector task force to explore the hypothesis that "if platforms could verify which of their users were children, then as a society we would be better empowered to protect children from harm as they grow up online".

The task force included experts in technology, privacy and law enforcement, child protection specialists and government policy makers, as well as third-sector child safety organisations such as UNICEF and the NSPCC and representatives from major technology and social platforms.

The project had two phases. For phase one the taskforce met fortnightly for 10 weeks, holding five workshops and one round table as part of a high-energy, fast-paced commission to explore the VoCO hypothesis from multiple perspectives including ethics, children's rights, education, digital parenting, safer by design standards and regulatory oversight, with an overarching theme of preserving privacy.

Discussions were also informed by 'action research' that went on in parallel, including landscape analysis, child / parent use cases, market analysis and work seeking to define the existing, emerging and trial technical solutions in the VoCO space.

Phase one explored the need for a coherent partnership between platforms, parents and children, balancing the right of young people to benefit from all the internet has to offer, while also having the right to be kept safe.

A range of promising solutions were identified for further exploration and trialling, and a product/solution scoring system developed. Six leverage points were identified across ISPs, devices and platforms where verification could take place.

The commission also identified and worked with a number of innovators in the child age verification space. This included paper-based assessments against the criteria from the product selection work and a real-world end-to-end trial of a prototype technology with parents and children.

The task force delivered a phase one report with ten key recommendations designed to help find a workable, practical solution focused on preserving privacy that will make a real difference to the age verification of children online, help protect them from sexual abuse, and inform other online safety and privacy consultations.

The second phase of the commission aimed to further test the theoretical and practical aspects of VoCO by providing valuable research and demonstrable practical proof of concepts to help inform wider government initiatives where VoCO and the aim of making children safer online is an underlying foundation.



CASE STUDY

Cutting edge tech to fight child abuse imagery Child Abuse Image Database (CAID)

ACE facilitated the development of a number of digital tools that accelerate investigations into child abuse images by enhancing the capabilities of the Child Abuse Image Database (CAID), helping to catch more offenders, better safeguard children and protect the welfare of investigating officers.

These tools were

- A fast-forensic algorithm to rapidly analyse seized devices to identify indecent images of children
- A capability to assist with the categorisation of illegal imagery
- A capability to detect images with matching scenes to help identify locations in common of indecent images of children

All three tools have been successfully live tested by the National Crime Agency and the Metropolitan, Norfolk, Suffolk and Surrey police forces.

During a demonstration at the CAID innovation lab last year, then Home Secretary Sajid Javid described these tools as ‘game-changing’, and went on to announce a £30million additional investment in capabilities to combat child sexual exploitation.

The Innovation Lab itself had been built in 12 weeks with support from ACE, achieving approval to test new technology using a copy of representative live data.

The Child Abuse Image Database holds millions of indecent images of children, and the volume and sharing of child abuse imagery continues to increase.

Assessing and classifying these images has historically been an entirely manual process, limiting the pace of investigations and having a significant impact on the officers exposed to high volumes of distressing material.

These cutting edge tools will drive faster outcomes, dramatically reduce the burden on officers and, ultimately, help protect more children.



Growing, diversifying and collaborating to deliver mission impact

by Simon Christoforato, Vivace CEO

The Vivace community is now more than 230 members strong. But growth, for us, is not simply a numbers game, it is about impact and diversity of both capability and approach. Engaging the right organisations to be able to move at pace on customer assignments is key.

The Maritime Security commission has been a good example of such diversification and flexibility, as we were able to bring new companies into the Vivace community to deliver specific specialist capabilities and knowledge, in this case sensor technology to bring additional data sources into an enhanced fused situational awareness picture.

It demonstrates the partnership between public and private sectors that Vivace and ACE embodies. It is shared commitment, aligned thinking and co-investment on mission problems that delivers the most impact and value for both customer and supplier.

These qualities were abundant in our first Impact Lab in which Vivace members were given unprecedented access to real data from a closed police investigation. It unleashed genuine creativity among participating companies, who picked up and ran with the mission problems presented.

What this highlights is a focus not just on technology but the way in which it can be applied through a deep understanding of the real challenges police chiefs and their officers face day to day.

It's about how we make data and technology solutions come to life for operational users while helping our community to really understand how their capabilities can deliver impact within the complex policing and digital data landscape.

Key to this is creating the opportunities for pull-through into exploitation that returns value for the investments made by our Vivace members.

As we embark on a further two-year contract for Vivace to power ACE, I'm really looking forward to developing and expanding our ways of working still further to enable that partnership to deliver greater impact and drive co-investment between government and private sector.

Many of the challenges our public sector customers face are the same ones that businesses are grappling with, for example in areas of cyber crime. So, we will now be bringing our innovation, ways of working and diversity of thinking to bear for private sector customers.

Of course, recent months have been dominated by the impact of the coronavirus pandemic. Our commission pipeline has remained strong – including support for the government's response to the crisis – and our secure collaboration tools were designed to make remote working simple and effective.

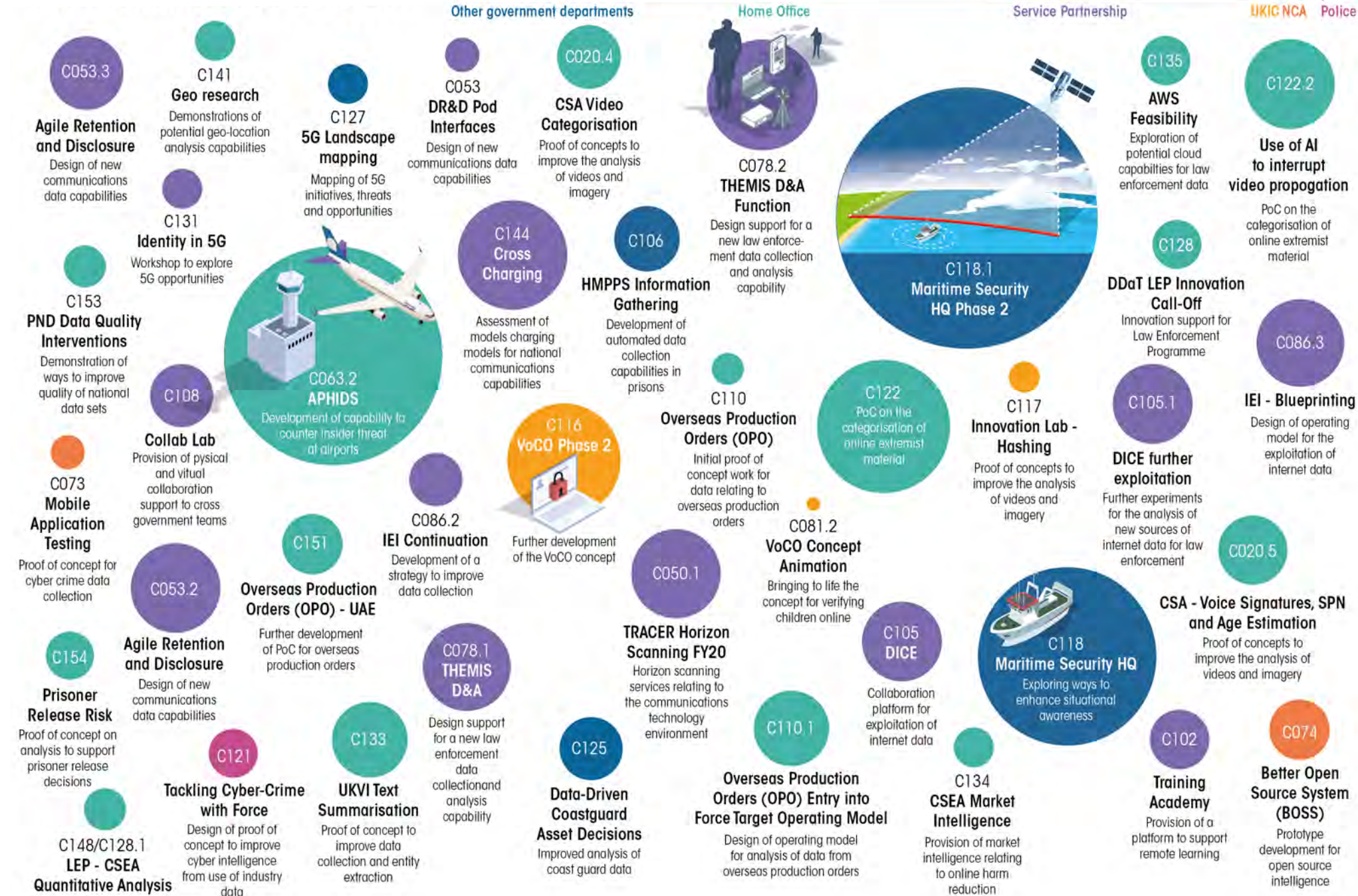
We have maintained the tempo of our events, adapting formats and experimenting with new ones to ensure that the engagement, collaboration and networking our community values can continue.

It is testament to the ACE ways of working that we have been able to continue delivering for our customers without breaking stride.



I'm really looking forward to developing and expanding our ways of working still further to enable that partnership to deliver greater impact and drive co-investment between government and private sector.

Simon Christoforato



IMPACT LAB

Impact Lab: Igniting front-line innovation

ACE launched Impact Lab to bring industry and academia know-how even closer to frontline mission challenges and to enable innovation using real operational data from closed police investigations.

The inaugural Impact Lab revolved around Derbyshire Constabulary's Operation Doubrava, a complex, 18-month investigation into an international human trafficking and modern slavery operation.

Participating Vivace organisations were given unprecedented access to members of the investigating team and to the significant volume and variety of data from the case which presented challenges including text extraction, translation, and integration.

Participants developed solutions to a number of defined challenge areas before returning to pitch them to a panel including Derbyshire Chief Constable Peter Goodman, National Police Chiefs' Council Chair Martin Hewitt, City of London Police Commissioner Ian Dyson and Sussex Police Chief Constable Giles York.

The panel was extremely impressed by the quality of the pitches which presented numerous ideas valuable to frontline policing. Two solutions were selected for funding into the next stage of development.



COLLAB LAB

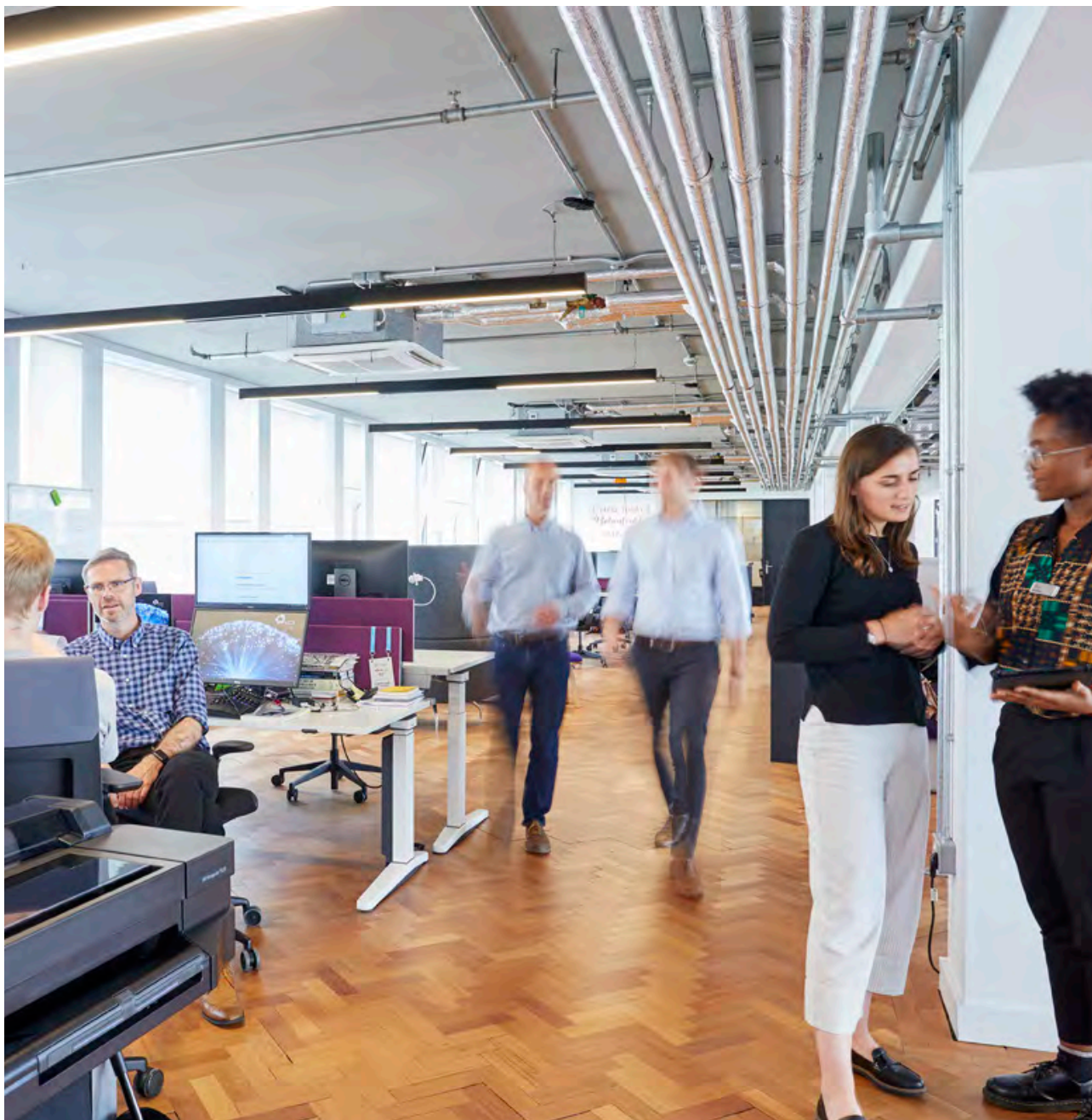
Opening up collaborative ways of working

Collab Lab was conceived to make the collaborative ways of working developed by ACE available more widely as a way to foster different thinking and new approaches across government.

It offers a neutral space for different teams to come together on projects. Prior to Covid-19 lockdown, purpose-designed areas were developed within the ACE Space at Tintagel House in Vauxhall to enable agile, sprint-based working. The same ACE IT infrastructure that has been designed to support such collaborative teamworking has seamlessly translated to remote working across all of ACE operations and commissions.

Genuine collaboration is at the heart of Collab Lab, and so users sign up to a Manifesto that commits them to practices and behaviours that make it a practical reality. Its ultimate purpose is to drive active engagement that creates efficient, enduring mission impact to customer user groups through more effective collaboration.

Collab Lab launched with 70 people working across three teams. Weekly 'Show & Tell' events provide opportunities to share insights and highlight work across the wider ACE community. Again, these have continued into lockdown with events successfully delivered and well attended remotely.



ACE FUTURES+ INSIGHT

In FY20, ACE's Futures & Insight capability ramped up the pace and volume of output for the Communications Data & Lawful Intercept Service Partnership, producing 45 deep-dive foresight and market analysis reports over the year, while successfully taking on further work for new customers across HMG. This growth was enabled both by building the delivery team – we now have six on-call futures analysts – and by multiple innovations in how we access and engage subject matter expertise.

“Calls-for-insight” have delivered the participative spirit of a round table in slower time, increasing the rigour and depth of contributions, and exposing a wealth of perspectives alongside the analyst's informed synthesis. For more focused enquiries, technical and industry experts have been coaxed into speculative scenario development – and then rigorous probability evaluations – in iterative foresight pairings with futures analysts. Niche market intelligence firms have applied deep, narrow expertise to operational challenges.

This has all been underpinned by sensitivity to the complex mix of needs for recognition, engagement and remuneration across industry and academia. It's also supported by a robust resourcing function which identifies temporarily-available experts to offer neutral, candid, informed insight,

shortcutting or supplementing traditional industry engagement.

The majority of our FY20 futures and insight outputs have focused on technology and industry. However, we also carried out various projects which examined public privacy perceptions and narratives, the largest of these using at-scale behavioural market research to achieve new levels of segmented insight. This work makes a solid, empirical contribution to the ethical aspects of ACE's campaigns on data-enabled innovation.

We have ensured that as many of our commissioned deliverables as possible are freely available to the wider law enforcement community. Meanwhile, our weekly horizon scanning service for technology, transformation and futures leads across law enforcement and national security has won a highly receptive audience, increasing its circulation fivefold from launch through referrals and shares. Towards the end of the year, we launched projects which bridged the gap between this short-form threat and opportunity commentary, and the operational process we bring to our commissioned work, allowing ACE to incubate and evaluate potential new workstreams.



Engaging the innovation community

The Vivace industry and academia community has continued to grow and diversify in step with the evolving needs of the widening ACE mission customer base. At the heart of our approach to ensuring this community remains engaged, responsive and informed of work opportunities lies a varied programme of events.

Last July's ACE Conference at Level 39 in Canary Wharf brought together larger numbers of Vivace members, customers and other stakeholders to learn, share ideas and network.

Covering themes of data science, machine learning and artificial intelligence, it was a chance to hear expert speakers, learn, and engage in discussion around these important subjects.

The conference – as with the numerous community events at the ACE Space in Tintagel House – also featured pitches by Vivace members to allow them to showcase their capabilities to key audiences.

While the coronavirus pandemic put such events on hold, ACE shifted gear to take events online while developing formats that deliver value for everyone taking part.

The number of events has actually increased during lockdown, but they tend to be shorter with more specific focus, providing easier ways to engage and access the most relevant content.

Weekly 'Ask Me Anything' Q&A sessions give any Vivace organisation the opportunity to showcase their expertise and capabilities.

Regular business surgeries offer advice on working more effectively with ACE, provide commission pipeline updates and, more generally, offer greater understanding of the law enforcement, security and policing landscapes and the opportunities that exist within them.

We have strived to maintain the social aspect of ACE events, being conscious of the value to our members of coming together and creating opportunities for collaboration.

ACE will continue to develop its events to ensure we keep building the relationships with – and between – the members of the Vivace community and to facilitate the innovation they deliver for our customers.



MIT report hails ACE innovation as model for government

ACE was the subject of an independent review by the Massachusetts Institute of Technology (MIT), which concluded that it provided a working model for how government innovation can deliver rapid mission impact.

In a comparison with MIT's Sloan School model for successful innovation, the study concluded ACE represented an effective co-creation model which should be replicated across the UK government.

At the heart of the MIT's findings was the value to government of bringing small entrepreneurial start-ups and SMEs into the mission space rather than relying on traditional, established relationships with large prime contractors.

The study also highlighted the value of the ACE Space at Tintagel House, 'which blends the collaborative buzz of an "entrepreneurial co-working space" with the security and mission-driven focus of a public sector agency in this field'.

The study praised the 'vision' of OSCT in championing such a novel and innovative agency. It also highlighted the value to government of bringing small start-ups and SMEs into the mission space rather than relying on traditional programme delivery mechanisms and existing relationships with large prime contractors.

The report stated: "ACE has already delivered results, and at a faster pace than many expected."



ACE wins industry innovation award

ACE was awarded the Innovation Award by the Institute for Collaborative Working at its ceremony for finalists at the House of Lords in December. The award recognised the innovative approach ACE brings to solving public sector challenges through the power of collaborative working.

The award citation read: “Accelerated Capability Environment (ACE) is a Home Office initiative to bring together experts from government, industry and academia in order to tap into current and future development to address the ever-increasing challenges faced by the UK, from child protection to crime and terrorism. Advising on policy and change to make our country safer for all.”

Head of Ace Toby Jones and Vivace CEO Simon Christoforato received the award and were accompanied on the night by OSCT COO Richard Alcock and Head of CCU Katie Gardiner.



ACE IN NUMBERS 2019/20

41

Commissions delivered

67

Organisations winning
commission work

74%

of them are SMEs

All figures relate to FY19
unless otherwise stated

233

Organisations in
Vivace community

80%

of them are SMEs

£25.9m

Value of work
through ACE

20

Organisations brought
problems to ACE

499

People using ACE Space

1200

Current subscribers
to ACE Insights

267

Contracts placed

57

Regular users of Secure Space

500

Delegates attending
community events

100

attending workshops and round-tables

2,500

Visitors to
ACE Space

£3.9m

Cumulative savings

Home Office:

Toby Jones – Head of ACE

Jen Wallace – Deputy Head of ACE

Vivace:

Simon Christoforato – Chief Executive Officer

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