KERNOW FORNIA

Cornwall's Digital Economy 2016

PFA RESEARCH

CONTENTS

A focus on the high growth Digital Sector in Cornwall & Isles of Scilly.

Introduction

Our lives are becoming increasingly digital and the benefits of technology are reaching people of all ages and backgrounds – over three quarters of adults now use the internet every day[1]. The Digital Economy is leading the growth of economies across the country and the emergence of Cornwall's digital tech cluster is being recognised on a national stage.

In June 2016, market research & insights company, PFA Research took another look at this fast evolving industry in Cornwall to see what the recent developments are. We looked at the latest facts and stats being used to define the sector, and gathered in-depth insights from some local digitech business leaders.

This report provides a valuable update to the evidence base and will act as a catalyst to drive further work in mapping the key contribution of Cornwall's digital sector to the UK economy.

With thanks to Cornwall & Isles of Scilly LEP for supporting the design element of this document. The research and opinion gathering was conducted independently by PFA Research.

Sector facts and stats

The Digital Sector is defined using Standard Industry Classifications (SICs) as an extension of the ICT sector which also includes activities such as publishing, motion picture, video and TV production, sound and music publishing, and radio and TV broadcasting.

The Digital Economy is a wider measure which represents the value of digital activities to the wider economy, as there are many people working in digital jobs for organisations which are not part of the Digital Sector and many more making use of digital technology to do their work (e.g. through e-commerce) who do not work in digital jobs nor the Digital Sector.[2]

2.0
MILLION JOBS
in the wider Digital Economy

UK DIGITAL SECTOR
(2014 STATS)

GVA
£118.3bn
(**7.2%** increase on 2013)

1.4
MILLION JOBS
(**4.4%** of total jobs in the UK)

7.3%
OF THE UK ECONOMY

TOTAL EXPORTS
£43.0bn
(**8.2%** of all UK exports (goods and services) - 2013 figure)

DIGITAL SECTOR BUSINESS NUMBERS
(2015 STATS)[3]

UK: 206,000
ENTERPRISES

SOUTH WEST
15,765
ENTERPRISES
(**8%** of the UK total)

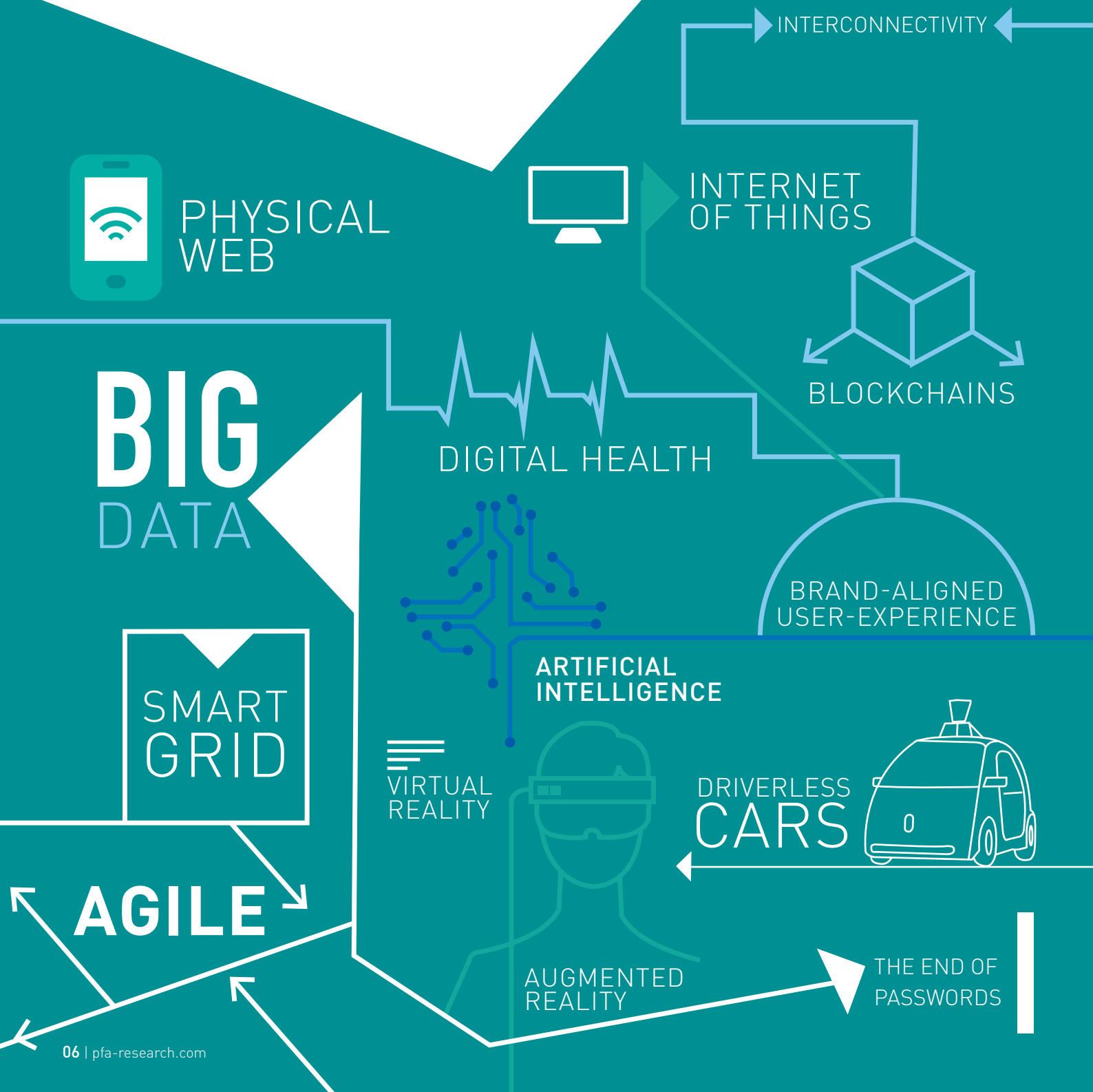
AN INCREASE OF OVER
60%
SINCE 2009[4]

CORNWALL
Equivalent figures are not available for Cornwall & Scilly, however Business Register and Employment Survey (BRES) data suggests that local technology companies alone employed over

2,200
PEOPLE IN 2013

Industry developments

In June 2016, PFA Research conducted a focus group and in-depth interviews with Digital Sector industry experts in Cornwall. When asked about the exciting developments in the industry, our digitech leaders enthused about:



> AR [Augmented Reality] is going to change the game – the next big thing is to get rid of the screen and free you from your seat.

TANYA KRZYWINSKA
Falmouth University

Tanya Krzywinska, Professor of Digital Games at Falmouth University talked about something we used to only see in sci-fi film: "AR [Augmented Reality] is going to change the game – the next big thing is to get rid of the screen and free you from your seat. It's about geometry in real space, so any old space can act as a games space. It'll change the media industry – imagine the Star Trek Holodeck, where you can be in a story space physically."

MIKE TREBILCOCK
Cornwall College

Mike Trebilcock of Cornwall College mentioned: "The physical web is something that's excited me in recent weeks – Eddystone beacons transmitting a URL is something we've had in the background for a couple of years, but that ability to go somewhere, like a museum where you see an exhibit and your phone buzzes and says look at this link and there's more information, there's a video about it. If you then tie that in with augmented reality to be able to see the exhibit come to life... there's amazing possibilities that I can see that Google and others are building in mobile devices which I think we'll see more of over the next few years. Particularly if you take that out to retail or other areas, it's technology that could really change things and how you use your mobile device."

JULIAN COWANS
Superfast Cornwall

For Julian Cowans of Superfast Cornwall, virtual reality stands out: "When the talk is all about 'let's go faster and faster' and you're wondering, 'so what applications are we going to be using here?', the one thing I've seen demonstrated which is pretty impressive, is some of the virtual reality stuff. So if you can imagine you have this device on your head and the amount of bandwidth that's required to transmit a 360 degree sphere of high definition video around you, so that wherever you look at any one time it's pretty much instantaneous and the visual information is there, it's pretty impressive.

"There is a conversation that we've gone superfast and now we've got to go ultrafast, but the stuff I come across on a daily basis is I'm constantly being made aware of how important having good broadband is to everyone – people use health services, people do their homework online and use education services and apps, people set up loads of businesses if they've got access to superfast in their home, that kind of stuff. But the people that can't do all that stuff, who say "my kids can't do their homework", or "I've signed up to this new health app through the hospital and I can't check my health online and I've got this chronic condition"; it's those sorts of things that make you realise that there are huge impacts for people who can't access this service that is becoming very widespread."

RANULF SCARBROUGH
BT Group

CORNWALL IS LEADING THE WAY IN ULTRAFAST BROADBAND WITH OVER

30%

COVERAGE OF FIBRE TO THE PREMISES (FTTP) TECHNOLOGY OFFERING SPEEDS OF UP TO **330Mbps**.

Ranulf Scarbrough of BT Group added: "All of these things are enabled by the underlying connectivity - both fixed and mobile. The UK's in a strong position in a European context, it tends to be ahead of most of the major European economies. A huge investment has been made in fibre both commercially and with Government programmes such as we've seen here [in Cornwall].

"We've just announced a further £6bn of investment on fixed and mobile – EE are taking 4G to 95% landmass – so the underlying connectivity will be there. The challenge for the industry is service and reliability, as the more people rely on these services and the more important service becomes, the more important reliability becomes. A lot of these networks are fundamentally more reliable but the more importance people place on these services, the more critical they become to businesses and to our lives."

In fact, the May 2016 Queen's speech has set a commitment for a 10MB universal service obligation: "Measures will be brought forward to create the right for every household to access high speed broadband. "It also highlights the growing importance being placed on our digital sector: "Legislation will be introduced to improve Britain's competitiveness and make the United Kingdom a world leader in the digital economy."

> People are looking at what 5G is going to bring and the early trials - faster uploads and lower latency become particularly important when you're looking at connected cars, driverless cars, the internet of things – very large numbers of connected devices. So, it isn't just about speeds, it's about infrastructures that can cope. It's about having this platform for innovation that allow all these services to happen.

> There's lots happening in GPS in terms of accuracy and availability of the network for a lot of the connected devices - wearables, connected car, autonomous vehicles, drones, etc.

FIONA CAMPBELL-HOWES
Radix Communications

Fiona Campbell-Howes of Radix Communications cited a much more unseen technology: "There's lots happening in GPS in terms of accuracy and availability of the network for a lot of the connected devices – wearables, connected car, autonomous vehicles, drones, etc. Lots of things rely on GPS for positioning and navigation, but also for precise timing. GPS broadcasts a precise time signal which is used by electricity grids, telecoms networks and people rely on it without realising it.

"Getting into cybersecurity, it's getting easier to hack GPS to jam it and also to spoof it, which is to broadcast a fake GPS signal, so you can fool something into thinking it's somewhere else which has all kinds of interesting ramifications. We're working with a company in Devon which tests that your GPS system works as you might want it to, to protect against this new wave of hacking and jamming that could be quite disruptive."

Something the Cornwall & Isles of Scilly Local Enterprise Partnership is keeping its eye on, that BIS (the Department for Business, Innovation & Skills, the Government department for economic growth) has talked about through the national Growth Hub network, is the possibility of reallocating the analogue TV spectrum to aid the development of driverless cars and whether they can accelerate the process.

DAN PUGH
Piran Technologies

Dan Pugh of IT Services company, Piran Technologies, said: "In terms of media consumption, a lot of us are watching more and more over the internet, so things like BBC iPlayer and video on demand, Netflix and Amazon. The transition to delivering everything through the internet is sooner than you think."

Scarbrough adds: "There is an issue with digital inclusion because you can turn it off for 95% of people, but for the 5% of people who can turn on the TV but can't use a computer or don't have an internet connection it's a big challenge."

TOBY PARKINS
Headforwards

Toby Parkins of software development outsourcing company, Headforwards, said: "The key opportunities that we've got locally are energy, eHealth and cyber-security. But then actually on a global perspective, IoT – Internet of Things – is just a huge growth area. I was chatting to the guys from Hitachi and they're basically just saying 'we're an IoT company from now on'. With IoT, the value is in the data... all these large organisations have identified that the value is in the data and therefore they need to control the data, and therefore they create these infrastructures as they don't want to let that data out again. I do not think you will be able to take company x big data project system and compare it with company y's big data and IoT collection unless there is massive negotiations going between them.

> **One of the things that drives innovation is this openness, open source... if you look at the way the cloud has developed so massively, it's actually because of the fact that it's service-based, REST API based systems that allow you to integrate lots of different services, lots of different products together very very easily and quickly and cheaply.**

"But actually I don't see the same happening in the world of data control and ultimately that's going to stifle innovation or make it very closed.

"In order to get the next big innovation you want to be able to compare lots and lots of different data from repositories but you've just got to be able to. I've got an app which tells me exactly how much energy my PV is [generating]; it'll tell you exactly how much energy is being used, but I can't link that to switch my car on to charge when it's the best time."

Finally, security is also top of the list for Pugh:
"There's been quite a lot of extreme risks in the last year in terms of things like ransomware destroying quite a lot of data, which is unusual. In the last ten years, I wouldn't say viruses destroyed things so much, they were just a nuisance, whereas in the last 5 months, we've seen a lot of businesses who've had actual loss of data and quite significantly. Also, data being leaked as well; so security is very much on the radar.

"Things like two factor authentication and actually removing passwords completely, with things like UB keys, has a lot of interest for us. Security generally makes things more complicated and painful, but if it can actually get rid of your password when you log in in the morning, then that's a big step forward. If you can then link it together so when you press something, it also logs in to your bank and to Facebook and to all of the other websites you use - that you haven't got to remember or change your passwords ever, it's just a button you press - that sort of technology is starting to converge and take off."

The ones to watch

So who's setting the agenda? Whether local, national or global, who are our industry leaders watching? The tale was of the Goliaths... and many many Davids: "Amazon" "Google" "Hitachi" "Apple" "Tesla".

Campbell-Howes cited: "Amazon Web Services - they are completely lowering the bar for what people can do with technology and making the kind of technology accessible to people that as a start-up or a small business you wouldn't have been able to afford before. So that kind of service being available now... I think it's going to enable much more innovative stuff to happen than will have been possible previously."

Pugh adds: "It's not just Amazon - Azure and Google - they're all very similar converging platforms in terms of price and what they deliver. Service delivered applications - they are the future of the cloud - not having to have hunking great servers, whether virtualised or physical, it doesn't really matter, but to just have the service - that is the future. It's a huge step change in how people work on daily basis in terms of any app from accounting to email to you name it."

For Trebilcock, it's: "Digital Ocean – they're great if I need a server very quickly and it's done very easily. Students who we're going to be working with ought to be coming out into industry knowing these things are out there and you can't go wrong following the Amazons, the Googles, Microsoft and at least having some currency in what they're researching and what they're working with.

"Microsoft is fine for most of our provision and most of our students because for most of them will go into a business type environment where they're using Microsoft platforms and that's the one of choice at the moment. But for those that are involved in the digital industries then that's not necessarily the one of choice... so part of what we will be doing is moving across more to open source platforms and getting our students familiar with those environments."

Mike Barritt of health technology business, SCSLhealth, said: "Globally there are plenty of start-ups that will create disruption going forward – Uber being one example, so it will all be about different business models and models of running businesses."

Other examples cited include:

- **Magic Leap – Using their 'Dynamic Digitized Lightfield Signal™' to generate images indistinguishable from real objects and then being able to place those images seamlessly into the real world.**
- **Tesla – which has opened up its patents "in the spirit of the open source movement, for the advancement of electric vehicle technology", demonstrating it is a socially conscious organisation.**
- **...and lots of small players in the smart energy market. Parkins says:** "Heating, hot water, EV cars, micro-storage - there's lots of investment going into smart energy. The innovators are lots of small companies. Once the industry protocols are established, everyone can sign up to use them, but no-one has established the model yet."

amazon Google HITACHI TESLA

The digitech cluster in Cornwall

Tech Nation 2016 from Tech City UK, in partnership with innovation charity, Nesta, highlights Truro, Redruth and Camborne as a leading UK digitech cluster in terms of its turnover growth of 153%. Whilst our local sector leaders were not convinced that this area denomination quite describes the Cornwall tech cluster accurately, it is very encouraging to see our Digital Sector being recognised on a national stage.

So what is going on in Cornwall now that is most groundbreaking and what can we be proud of?

Campbell-Howes emphasises the games and digital animation movement in Cornwall: "There's a very good digital animation course at Falmouth University that is churning out a lot of graduates who are setting up their own studios locally and the same with the games courses, so I think that's definitely one to keep an eye on – it's not just IT.

"For a long time there's been companies like Spider Eye in St Just that are doing animation for television, and now there's a lot of digital animation work going on in other sectors, not just broadcast entertainment and media. There's a lot going on in marketing and there's a whole load of different applications for digital animation now. Tthe fact that we've got a university here that has a course that teaches people that and people are graduating and choosing to stay in Cornwall I think that will become an important, growing sector for us."

Cluster networking

Software Cornwall is at the hub of Cornwall's growing tech industry, aiming to grow Cornwall's software community by providing learning, training and careers opportunities. A not for profit organisation, it is led by its membership of leading digital tech companies.

The Cornwall Digital Meetup Group

670 MEMBERS

IT HAS ORGANISED 160 NETWORKING EVENTS AND SPECIAL INTEREST / TECHNICAL MEET UPS OVER THE LAST 6 YEARS.

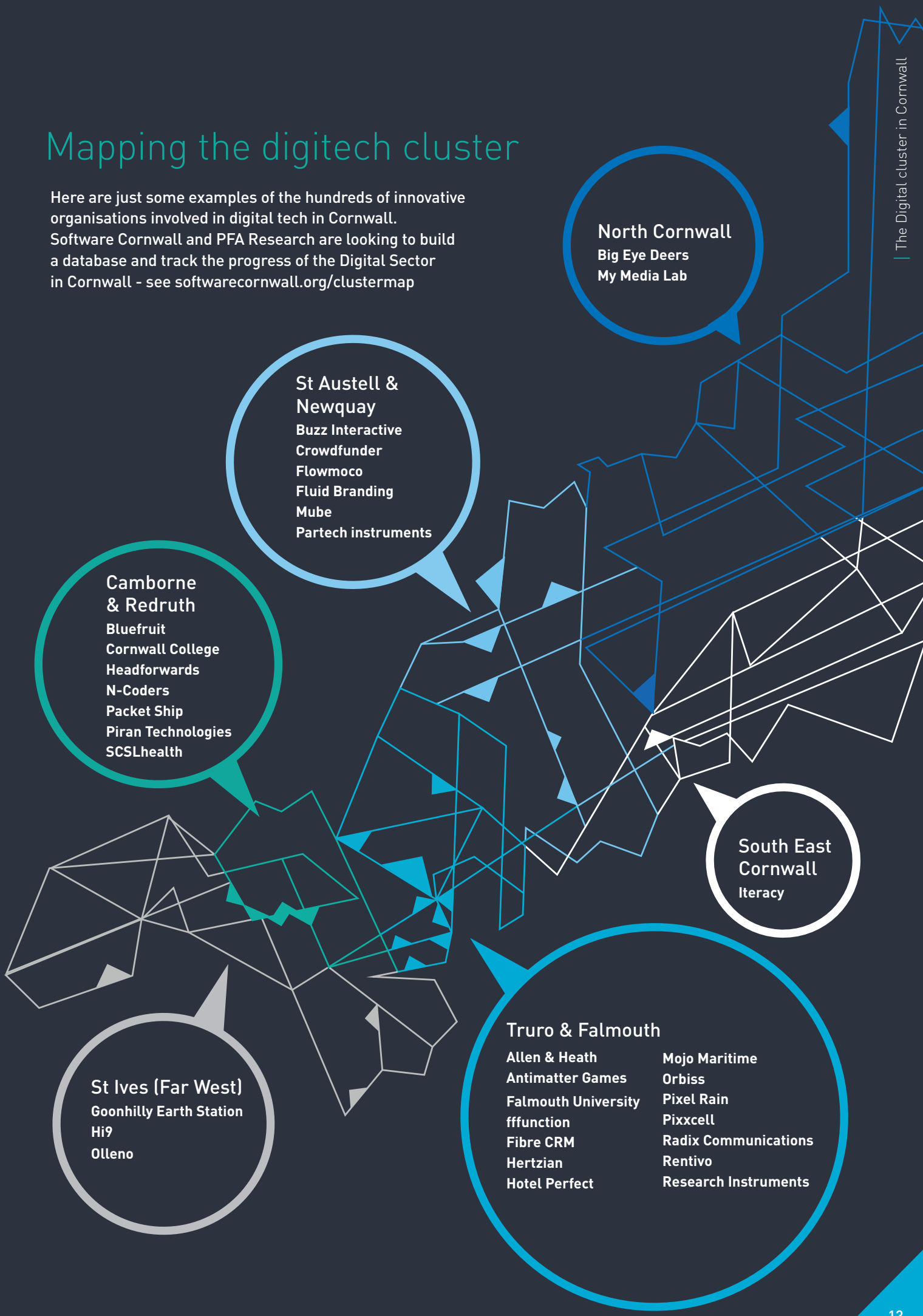
Digital Peninsula Network (DPN)

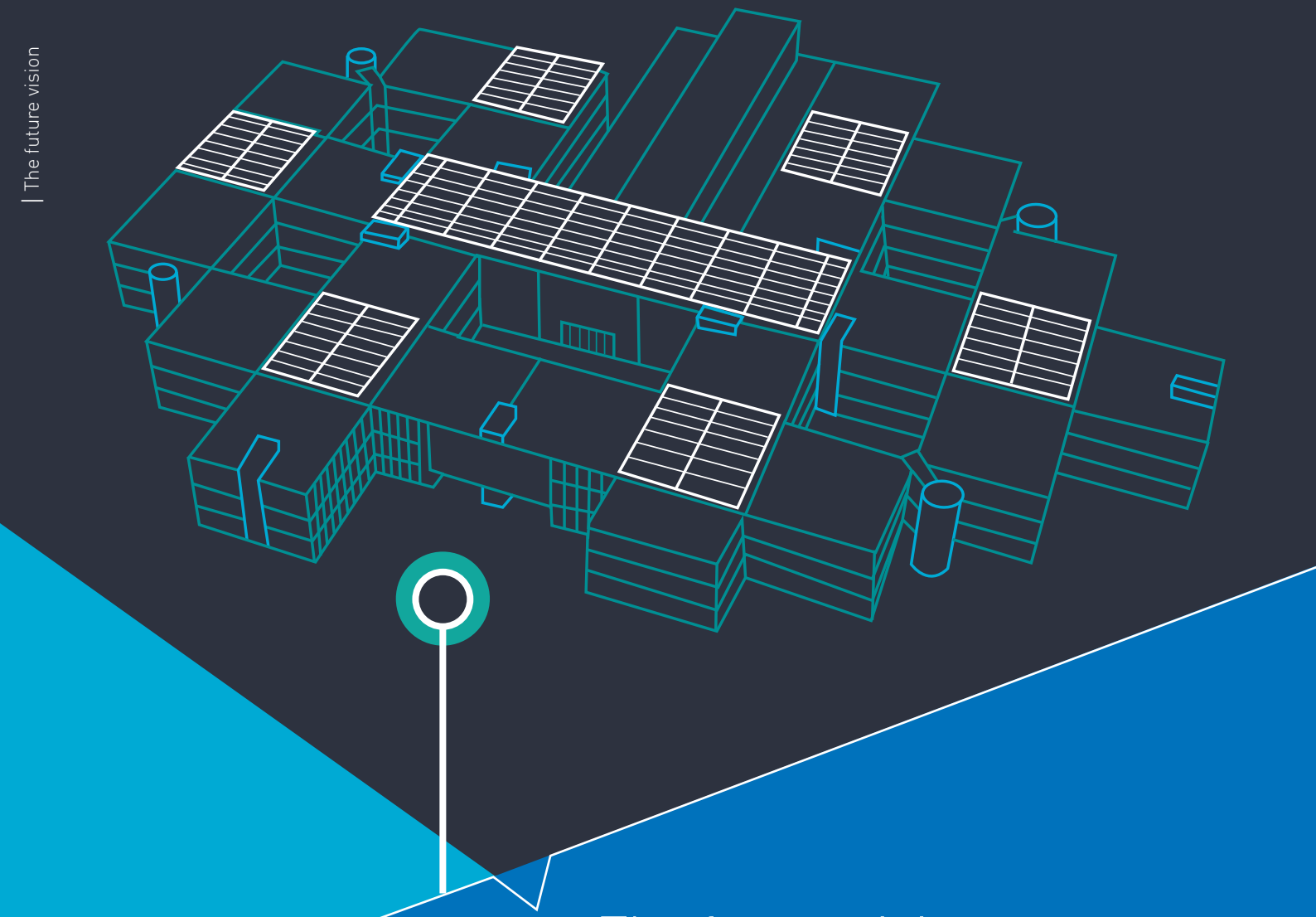
REPRESENTS NEARLY 700 ICT AND DIGITAL BUSINESSES IN CORNWALL, PROVIDING SUPPORT TO ITS NETWORK OF MEMBERS.

Agile on the Beach is a two day business and technology conference which attracts local, national and international speakers and delegates to the Cornish coast and includes a beach party.

Mapping the digitech cluster

Here are just some examples of the hundreds of innovative organisations involved in digital tech in Cornwall. Software Cornwall and PFA Research are looking to build a database and track the progress of the Digital Sector in Cornwall - see softwarecornwall.org/clustermap





The future vision

If Cornwall's digitech leaders could see into the future, what would it look like?

Paul Massey of Bluefruit Software says: "Cornwall is going to be the workplace of choice for the country's best software engineers. This is going to make it the productive epicentre for software in the UK."

Barritt sees ambition with social responsibility: "If I could write a vision it would be along the lines of Cornwall being seen as somewhere where technology is brought to life to the benefit of humankind – it sounds very arrogant and, maybe, a bit OTT but why not?"

For Krzywinska it's about sector growth through retaining talent: "The vision is to produce graduates who stay in Cornwall within thriving app and games development companies."

> "Cornwall is going to be the workplace of choice for the country's best software engineers. This is going to make it the productive epicentre for software in the UK."

And what is Cornwall going to need?

In the 2016 Tech Nation report, a limited talent supply was highlighted by 68% of local tech businesses surveyed, with close to half saying low sector awareness and limited access to finance were other challenges.

Parkins believes that the whole sector needs to be recognised collectively for maximum impact: "The work that Software Cornwall has been doing in raising the profile of the critical mass, the cluster... ultimately, as a knowledge economy the most important thing is people and actually having lots of [skilled] people and an increasing number of people is the most important.

"And the only way you get an increasing number of people building around the cluster is by communicating that the cluster is growing."

Scarbrough explains the conditions needed to help the sector thrive: "You need to work with an ecosystem of small companies which are much better able to innovate and take risk, and you need the big companies, because those are the ones that are going to be able to take things to market globally - you need that financial strength and recognised brand. Then you introduce to that university research as well, bringing the longer range research and supply of graduates and that three-way ecosystem tends to be quite successful.

"Where these things work, whether its Cambridge or Silicon Valley or Munich – a lot of these things are in physical proximity. Cornwall's got some of those things – an embryonic tech sector, there's universities - I'm not sure how engaged they are with companies and whether that relationship is right. It's harder for big companies to engage just because of the physical distance but those are some of the dynamics that you can learn a lot by looking at what some of the other places around the world are doing to make those successful and looking to see how you can either replicate those or mitigate the bits that you can't replicate. [Where it works] the universities are very focused on outreach and spinning out companies and spinning in companies and being very accessible. How geared up are we for that revolving door of innovation and skills?"

Massey thinks the focus should be on skills and learning:

> "There is already an exciting nascent learning environment which will be accelerated by the Digital Academy and the Fibre Park."

Krzywinska believes the key is investors and business space: "Investment and investors who are prepared to invest on new areas of games and app. Incubation and follow on space. Then you can have knowledge transfer events in order to keep up to date."

So even with superfast connectivity and cyber space and the cloud, there is a still a need for physical infrastructure and that's a real potential barrier to growth. Others agree - Barritt cites: "Business premises suitable for growing businesses. There are more now with 30-40 or more people (we are now 40 growing to 80, Headforwards is already getting close to 80) so really top notch premises will be essential."

Pugh said: "The one thing that keeps coming back is where are the businesses that should be moving down to Cornwall or that are outgrowing the Innovation Centres going to go? It's a common problem – there are no offices – you have to go somewhere else. Over and over again it's the real problem. We've been looking for offices now for three years and we just can't find any fundamentally affordable office space. We can buy a plot of land but you've then got to find someone who's going to develop it, someone who knows about all the planning requirements and we're too busy trying to run our companies, we're busy growing! It's one of our biggest barriers to growth."

Parkins adds: "Exeter Science park – it's the only place we can expand to."

Campbell-Howes agrees: "Even as just ten people, we found it really difficult to find an office."

Parkins explains the vision for the 'Fibre Park' development: "One of the main things we're trying to achieve with the Fibre Park, is actually creating something that's so attractive people will want to pay more because they're getting so much more value out of the building. So it's not just a case of office space, it's so when you walk down the corridor it's going to add value – whether that's through innovation or bumping into other people - essentially creating an innovation networking space so you don't need to go to networking events anymore, all you need to do is walk out of your office."

It's not just infrastructure in the way of office buildings that Cornwall needs. Barritt also stresses the importance of good transport links: "...road, rail and air and not just to London but to Manchester, Birmingham, Edinburgh and Leeds, that is affordable and business friendly. Actually getting to meet people face to face is still important and if takes nearly five hours to get here and back then this is a disincentive."

On skills and the supply of talent, Barritt says Software Cornwall have a really good handle on this: "It is not just programmers but also testers, programme managers, sales, marketing, support etc. that are required."

Massey believes: "We need more STEM skills at all levels. We need more practically focused learning for software skills. We need more employer involvement."

Pugh sees a shortage in management skills: "For tech skills, we're fine as we're all engineers, but we find it very difficult to find managers and attracting people in relies on people moving back to Cornwall for the lifestyle."

Cornwall College has just launched a new digital academy for Cornwall (iamdigital.uk), which to begin with will focus on software development. Trebilcock explains: "The way as a college we've been approaching teaching those subjects has been quite classroom based. What we're looking at is to be able to do it in a far more hands on, project based and building skills through experience and trying to get much closer to industry, using industry experts to bring those skills up to date and looking at what's the relevant technology at the time. We're starting with a pilot to begin with, of just twelve learners which will be based at Bluefruit's office in Redruth, so that it's an immersive environment, they'll be with us 9-5, it's like they're working but at the same time ticking off the bits they need to do for qualifications at the end of it."

Parkins recognises the investment the Digital Sector needs to make to help Education deliver the skills needed: "I think we - the industry - need to work more closely with both FE and HE sectors to grow education and make courses more relevant. We have to remember that technology changes so quickly so for education institutions to keep up to date, it's incredibly challenging when we want them to teach things that didn't exist when pupils started the course."

And finally, is there a magic ingredient? If so what is it and how we do nurture it?

Massey believes: "The magic ingredients are the things that Agile is made up of: empowerment, feedback loops, learning and built-in quality."

Barritt doesn't think there is one magic ingredient: "It is far more a well thought out recipe that brings many things together to make the right climate to encourage business to move to and grow in Cornwall. Probably "critical mass" is the one word I might use here so that Cornwall is seen as the place to be and people are not frightened of moving here or, as importantly, staying here. We are certainly finding that now so it is working. To nurture this do lots more of what we are already doing."

Krzywinska says: "Investors... and we also need a new collective forum, more regularly – AIR used to provide that – we need an alternative means now."

Acknowledgements

PFA Research would like to thank the people listed below for giving up their time to contribute their valued opinions to this sector study.

Michael Barritt – SCSLhealth
Fiona Campbell-Howes – Radix Communications
Julian Cowans – Superfast Cornwall
Nick Eyriey – Business Cornwall Magazine
Tanya Krzywinska – Falmouth University
Paul Massey – Bluefruit Software
Toby Parkins – Headforwards
Dan Pugh – Piran Technologies
Ranulf Scarbrough - BT
Mike Trebilcock – iamdigital.uk, Cornwall College
Belinda Waldock – Software Cornwall

There are many more people we would have liked to have talked to, and we welcome further comments and requests for information related to this report. Send your comments to: participate@pfa-research.com

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Images

With thanks to Invest in Cornwall (investincornwall.com) and Software Cornwall (softwarecornwall.org)

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Sources of information

[1]Office for National Statistics (ONS), Internet Access – Households and Individuals 2015. In 2015, 78% of adults in Great Britain accessed the internet every day (or almost every day) compared with 35% in 2006.
[2] Department for Culture, Media & Sport (DCMS) Digital Sector Economic Estimates released in January 2016. These Experimental Official Statistics were published in order to encourage discussion on the appropriate definition and measurement of the value of "digital" to the UK economy. It is envisioned that there will be significant developments in future, which include changing the approach to defining the Digital Sector.
[3] ONS - What defines the digital sector? (October 2015) / Business Activity, Size & Location 2015. Digital Sector volumes derived using DCMS definition of Standard Industry Classifications that make up the Digital Sector.
[4] Cornwall Council Smart Specialisation and General Innovation and R&D Evidence Report - Amion Consulting, August 2015

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