A Digital Proposition for: the North

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NP11

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01 Executive Summary

The digital economy is a rapidly growing sector of the UK economy. The North of England is a key contributor and is well placed to be at the heart of future growth.

The North of England is home to a range of some of the most advanced offerings for the UK's digital economy this includes, but is not limited to; Cyber Security, Big Data Analytics, AI and Fintech. It has become a destination to house and grow some of the world's leading contributors.

The digital economy of the North has a huge part to play in the UK's Levelling up agenda. With a focus on creating a digitally enabled workforce, it can start to bridge the gap between the appetite for talent and the supply of it.

The North is well positioned to make a significant contribution to the growth of the UK's GVA. The strong foundations of; infrastructure, innovation and education are poised to act as a catalyst for growth.

There is a lot of work being done by individual Local Enterprise Partnerships (LEPs) to support the growth and development of the sector, but there are benefits to be had with a more collaborative approach where the North can take advantage of the best-in-class assets it has. With the right empowerment and support from Government and stakeholders, unprecedented growth can be achieved.

Important factors include:
The continuation of devolution from a national to a local level is facilitating the change needed to meet the needs of the strong local clusters. These help to fuel the growth and act as a catalyst for further growth by addressing localised needs.

The creation of ecosystems that attract investment and provide the environmental factors for scale-up businesses to thrive are at the heart of the opportunity. The North, with the right support, can continue to become the destination for these.

The North has the opportunity to demonstrate what can be achieved if the UK is to level up. It can capitalise on the opportunity to export to a global audience and attract inward investment, furthering innovation through R&D and driving the creation of highly-skilled jobs.

This report recognises the reality of where the digital economy of the North finds itself on a local, regional and national level. It also puts forward a shared ambition which states...

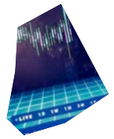
"the digital economy of the North should level up to support the UK's ambition of being a world-class digital leader. By 2030 the growth of digital scaleups in the North should drive the contribution of an additional £10bn to the UK's economy".

Accompanying this statement are three additional statements of ambition for the underpinning enabling factors, followed by recommendations to start to make headway to realise the ambition by 2030.

£10bn to UK Economy

Priority Areas for the North

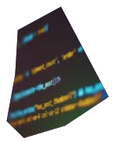
This report finds that the North can align around a set of strong assets to enable the future growth of clusters, and the overall digital economy of the North. In the North there are also strengths in the digital transformation of traditional industries such as manufacturing and creative, but the limited nature of this report focuses primarily on five key digital areas that showcase emerging and established strengths. They are;



A) Fintech - This is the UK's strongest startup sector. Investment outside of London to the North is increasing significantly. The establishment and growth of regional clusters needs to be continually prioritised by local and national government.

B) Cyber Security - In recent years the North has attracted significant investment, it's home to the newly created National Cyber Force and contains a depth of regional assets. These need to be further advocated for with a particular focus on the creation and infusion of talent into the industry. Ensuring a strong pipeline of talent to the North is a crucial challenge that needs addressing.

C) HealthTech - It is a rapidly emerging sector with strong clusters across the North. Although growing, it is significantly behind where it could be, with Northern companies attracting around 5% of the investment of the South East and East. Turning the tide on external investment is a particular challenge for the North.



D) Big Data Analytics (BDA) - Enormous value and potential is contained within the immediate, and knock on impact of BDA, the emergence of this market should not be overlooked. The single biggest factor in advancing this is skills, with 95% of companies finding it challenging to recruit. The North contains some of the best universities in the world of BDA, but it struggles to retain the talent created, changing the flow of this is crucial to unlocking the potential.

E) Artificial Intelligence (AI) - Is the fastest-growing digital technology in the world and is present across much of the North. The National AI Strategy needs to level up across the UK, with financial investment delivered to the North to help companies procure and sustain the operational costs of implementation.

01 Executive Summary

The finding of this report is that scaleups should be the focal point to drive change and growth across the Northern digital economy.

Enabling these businesses to take advantage of the growth opportunity in the digital economy is disproportionally advantageous as they account for less than 1% of businesses, but make up for more than 50% of the SME contribution.

It is clear that the digital economy thrives when the environmental factors are correct. There are three in particular that create the right conditions for growth. The North has aligned on 3 statements of intent for these;

1 "Infrastructure in the North should connect people to each other, people to businesses and businesses to markets to encourage economic activity, community prosperity and diversity across industrial, urban and rural areas through full-fibre broadband to every home by 2030".

2 "Innovation policy in the North should drive growth and productivity by supporting digital businesses, enabling the North to play its part in delivering the Government's national R&D objective of 2.4% of GDP by 2027 and increased public investment in R&D outside the Greater South East by at least 40% by 2030"

3 "Education in the North should bridge the digital skills divide. By 2030 every child should be digitally literate when they leave full-time education for the benefit of employers, communities and individuals."

The North presents an immense opportunity to realise the potential contribution of the digital economy on a national level. Collaboration across the North and on a national level is needed to achieve this. Included within will need to be the continued devolution of powers and support from the national government to maximise existing assets and capitalise on the opportunities ahead. Ultimately driving resilient, sustainable and inclusive growth.

02 Introduction

This report examines the Northern digital economy.

It looks at the current state of that economy, what programmes and initiatives support the flourishing of this, and recognises the national policy, regional response, and local policy context.

It draws on existing literature and incorporates primary research to conclude with recommendations from a National, Northern and Regional perspective.

The regional perspective consists of the NP11 which is made up of the 11 Local Enterprise Partnerships (LEPs) within the North. These are:

1. Cheshire and Warrington
2. Cumbria
3. Greater Manchester
4. Hull and East Yorkshire
5. Lancashire
6. Leeds City Region
7. Liverpool City Region
8. North East
9. South Yorkshire
10. Tees Valley
11. York and North Yorkshire

This report

In **sections 3 & 4** we review the digital economy of the North and draw out strengths that are recognised on a National level. The current level of performance is assessed against the potential for economic and societal benefit. We also consider what is needed to capitalise on the potential and make steps towards achieving this from a Northern perspective.

In **sections 5 & 6** we consider the macro themes of demand for digital and the enabling factors. We look at the national landscape and the role the North plays, as well as the underpinning factors that contribute to the flourishing of the digital economy. We examine this on a Northern level and recognise where we could be and what's needed to get there.

In **section 7** we look at the collective 2030 ambition for the digital economy of the North and what the economic and societal benefit could be.

In **section 8** we look at the factors that support the digital economy; Innovation, Infrastructure & Education. Each enabler has a statement of intent that the North has aligned behind, each one, facilitating to the success of the digital economy.

Section 9 is focused on the practical application of insight and research done. It brings together policies and recommendations on a; National, Northern and Regional level to achieve the Northern ambition for growth.

Methodology

This piece of work only focuses on the digital economy. With that in mind, the first key challenge facing us, and policymakers is how to define and measure the digital economy. Due to the evolving nature of the digital economy (Reed, 2021), there are multiple definitions and categorisations of what this is and isn't. This creates complexity and challenges to address this from a consistent standpoint. For the purposes of this report, we've used the definition from Measuring the Digital Economy. U.S. Bureau of the Census. According to Mensenbourg (2001), the digital economy is made up from:

- E-business infrastructure (hardware, software, telecom, networks, human capital, etc.)
- E-business (how business is conducted, any process that an organisation conducts over computer-mediated networks)
- E-commerce (transfer of goods, for example when a book is sold online)

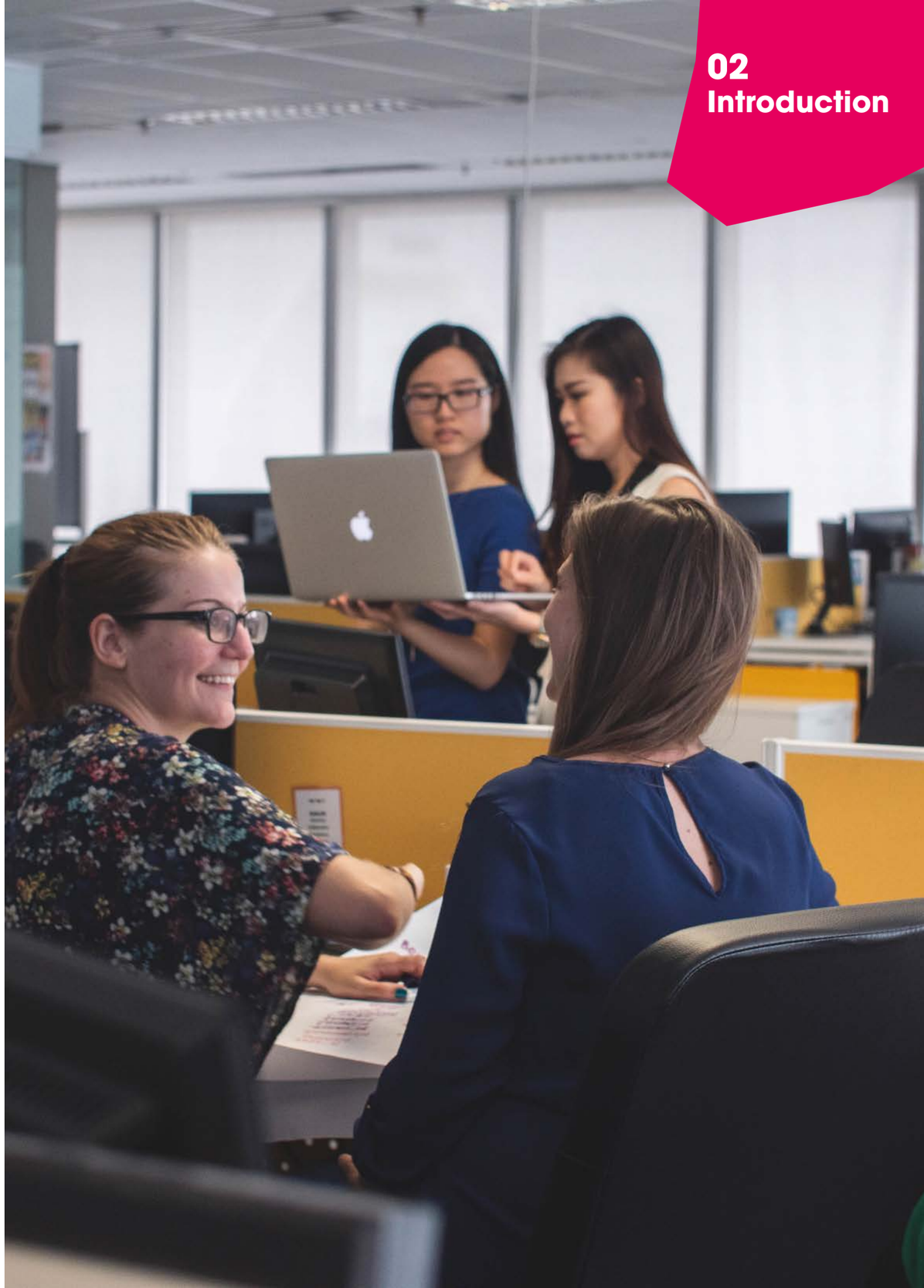
Data that has been drawn together is made up of primary and secondary sources, each region in the North has contributed a range of insight into this report. Given the timescales, resource and delivery ambitions, we note that the information will not be 100% complete and accurate, there will be rounding and educated estimates. We also note that the secondary sources drawn from will not be entirely current, however, this is in keeping with the brief as we seek to achieve something that is representative, rather than exacting.

Primary research was only undertaken in the North, therefore any conclusions reached with a National or Global context have been achieved through drawing from existing literature.

A similar approach was taken with the creation of the North Star and enabling factors. These statements of intent share an ambition and direction that is reflective of the collective North. They have been created in collaboration with the Chief Executives or their representatives from each Northern region.

The methodology of this piece of work examined the following;

1. Where does The North find itself at the moment
2. What are the programmes and initiatives that exist
3. What is the collective sense of ambition for the North
4. What needs to be done to bridge the gap between reality and ambition



03 Digital & the UK Economy

Where is the UK now?

The digital sector in the UK is one of the most important industries employing an estimated **1.66 million** workers in 2020, accounting for 4.9% of all employment (Department for Digital, Culture, Media & Sport, 2021).

It contributed over £151bn to the economy in 2019 with £11.2bn of venture capital funding, more than Germany and France combined in 2020 (Ibid). As an economic contributor, the digital sector in the UK is larger than the construction sector (£130bn) and the financial services sector (£126bn) (Ibid).

The growth of the digital economy is outstripping the rest of the UK economy including its contribution to the UK's GVA which is up 37% in the 5 years to 2019, compared with 19.5% for the country's GVA as a whole. It's estimated that by 2025 it could create 1.2 million skilled jobs (CEBR, 2020).

A key part of the digital economy is the technology sector. The Secretary of State highlighted that it is growing at a faster rate than the economy as a whole, and it has a huge part to play in driving the government's levelling up agenda (Digital Economy Council, 2021, p.2). The combined value of UK tech companies founded since 2000 is now £540bn (Department for Digital, Culture, Media & Sport, 2021).

UK tech captured more than a third of tech investment into Europe, and the £29.4bn raised by UK startups and scaleups was double the figure raised in Germany (£14.7bn) and almost three times that raised by companies in France (£9.7bn). UK tech investment accounted for a third of the total £89.5bn that flowed into the European tech ecosystem this year (Ibid).

Although important, tech is amongst a number of other key contributors to the overall digital economy. As the opportunity for tech to add value broadens through innovation, so does the number of sectors it's able to influence and contribute to. Although London attracts a lot of investment and press, there is a diffusion of tech and investment occuring beyond London.

Nine out of the 29 unicorns created in 2021 were outside of London. Of all the unicorns created in the UK, 35% are outside of London and 35% of futurecorns are also based outside of the capital, suggesting that the growth in tech in the regions will continue strongly in the next five years (Ibid). Almost £9bn of venture capital invested went into startups and scaleups outside London.

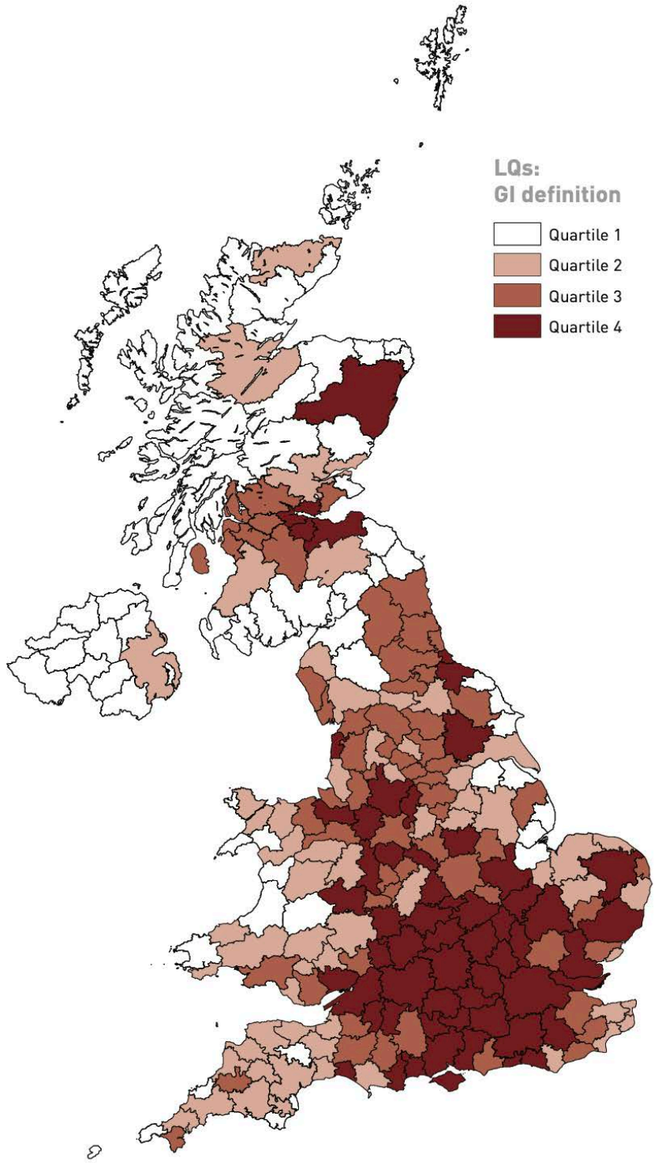
Where is the North now?

The North is home to 15.6 million people (27% of England's population), has a GVA of £360bn (22% of England's GVA) (Convention of the North, 2021) and over 1 million private sector businesses within a geographical catchment area from Liverpool to Hull and Sheffield to Newcastle. If it were a country, the North would have the tenth biggest economy in Europe (Siemens, 2021).

Across the eleven Northern regions, there are an estimated **37,073** businesses that fit the definition aligned with the definition of the digital economy with an estimated turnover around **£16.3bn** with a collective employment of **257,449** workers.

Growth intelligence software has mapped the digital economy of the UK and sees clustering in a few locations (**see figure 1**). This highlights areas in the North as high concentrations of digital economy activity (NIESR et al). In addition, the digital economy operates in a variety of sub-sectors including but not limited to IoT, BDA, Robotics, AI, ML, Hardware, Software, Telecoms, Networks, SAAS. A full breakdown for each region of the North can be found in **figure 2**.

Figure1: Location quotients of digital economy companies by Travel to Work Area to show clustering in 2012 (NIESR et al. p.28)



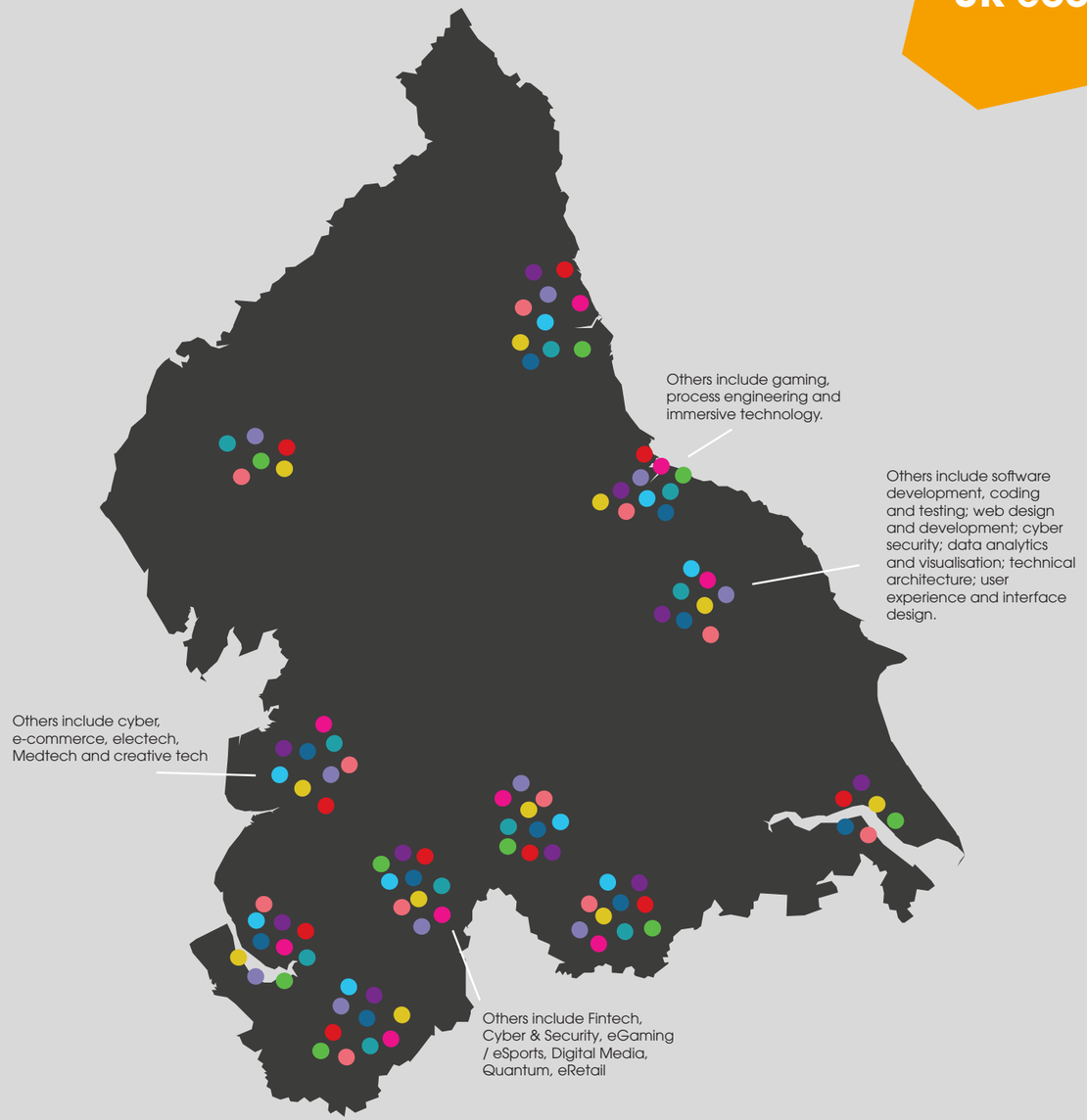


Figure 2: Sub-sectors of the digital economy in the North

04 Digital Technologies

Digital Technologies

The United Kingdom is one of the leading digital nations in the world and its economy has the highest percentage of GDP involved in the digital economy of all European nations (Business, Innovation and Skills Committee, 2016). The digital economy contains a rich myriad of businesses, people and technologies.

They reflect the forefront of innovation and compete in the race to lead a global stage. In a recent study on assessing the UK's regional digital ecosytems, DCMS found that; Fintech, Cyber Security, HealthTech, Big Data and Artificial Intelligence to be explicitly highlighted as promising areas (Department for Digital, Culture, Media & Sport, 2021).

There are significant strengths found in the North that, if taken advantage of, utilised and advocated for, provide substantial beacon assets for the UK on an international level.

Tech A: Fintech

Tech B: Cyber Security

Tech C: HealthTech

Tech D: Big Data Analytics

Tech E: AI

Tech A
Fintech

What is it?

Fintech, a portmanteau of 'financial technology', is a term used to describe the companies that develop innovative technological solutions in such areas as online and mobile payments, big data, payment processors, budgeting apps and cryptocurrency wallets. These often utilise algorithms, artificial intelligence, blockchain and automation, along with other kinds of digital banking technology.

The UK's 2,500 Fintechs are made up of 23 different specialisms, which aggregate up into 8 broad categories – banking, Regtech, Insurtech, lending, payments, Wealthtech, quote aggregators and accounting, auditing and cashflow management.

Where are we now?

The Fintech industry is the UK's strongest startup sector, with more than **1,600** high-growth fintech companies, 17 unicorn companies (half of the UK's billion-dollar startups), and more venture capital investment than any other industry.

Collectively, UK fintech companies have raised £20.8bn in equity funding, with a staggering £7.65bn in 2021 alone. Revolut is the UK's biggest Unicorn - having managed to raise $800 million in a funding round led by Softbank's Vision Fund and Tiger Global Management. It is now valued at $33bn, making it the biggest unicorn in the country as well as the highest-valued fintech company.

London still accounts for the lion's share of the top 50 startup and scaleup Fintech companies, with 86% still based there. However, there are signals and examples of fertile grounds outside of the South.

The UK's first app-based bank, Atom is based in County Durham and raised £492m between 2013-2022. This is a significant signal that the North has the ecosystem to be able to sustain the growth of some of the UK's most ambitious and high-growth startups.

Part of the reason for this is the strength of the rapidly growing clusters, all of which contribute to the much needed talent pool. They also have well-established industry research and local policy that's conducive to growth.

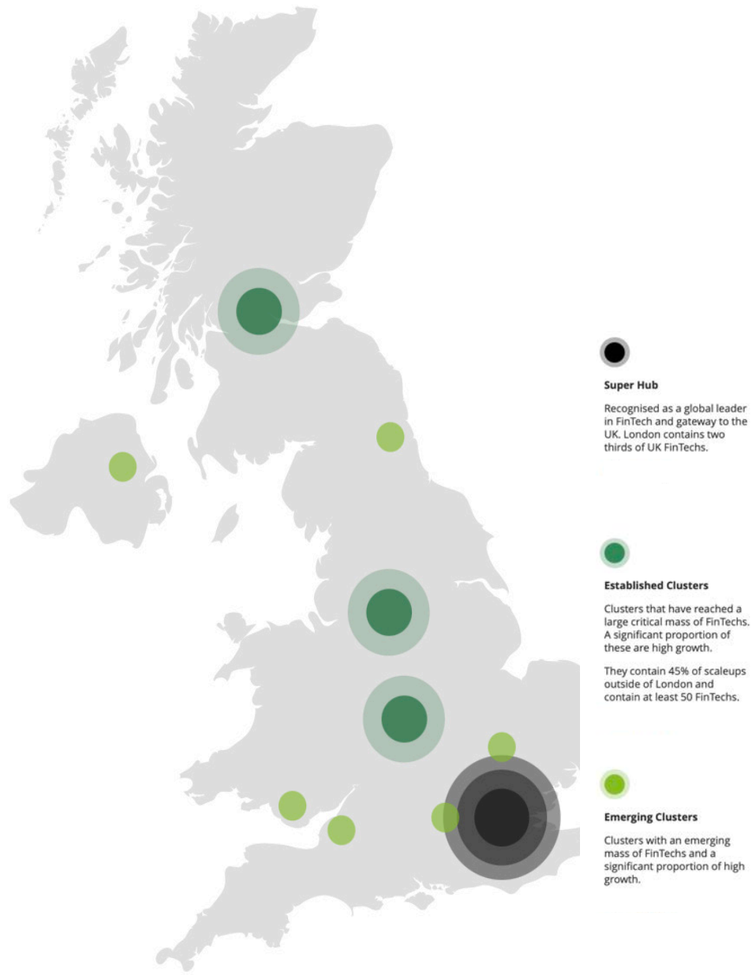


Figure 3: FIntech Clusters and their distinguishing specialism (Deloitte, 2021)

Where could we be in 2030?

The North West and the North East are emerging as some of the strongest regional hubs outside of London for Fintech innovation.

Fintech's upward trajectory is expected to continue (Beauhurst, 2021). The number of Fintech companies in the UK is set to exceed 3,200 by 2030 with an additional 24,000 people employed (Department for International Trade, 2019, p.12).

Sustainability is increasingly becoming a key social and economic driver in the Fintech industry creating movements such as 'tech for good'. If given the right support, the North has the potential to become the destination for Start-ups and Scale-ups to flourish.

Economic benefits

More than £6bn is contributed into the UK economy each year from Fintech. Innovations and exports to the wider financial services industry generated more than £132bn while supporting a £44bn trade surplus in 2018 (MPA, 2020). The economic impact to the North would be hugely significant if it prioritised the development of established Fintech clusters in the North.

Social benefits

Fintech has a unique opportunity to help the North progress, both through the creation of highly skilled jobs and by providing social opportunities for the UK and the global economy (Deloitte, 2017). If Fintech companies choose to locate, employ and scale in the North the local economic impact and knock-on effect would be transformative.

What's needed to further these benefits in the North?

There are four opportunity areas that need to be capitalised upon to further the opportunity for Fintech (MPA, 2020):

1 Collaboration
Getting started is tough. Much of the social and financial capital needed to launch a scaleup Fintech business comes from collaboration with people and institutions. **Investing in opportunities that stimulate the growth of clusters and existing UK Fintech assets (Deloitte, 2021) will support local and national economic development and can be a driver for Levelling Up.**

2 Investment
Creating a successful Fintech requires many highly skilled & expensive roles, there is also vast sums spent on customer acquisition, which means that early funding rounds are drawn down on extremely quickly. **Ensuring that the funding landscape is available to operate at the scale and speed of the Fintech's is crucial to support the high-growth trajectory.**

3 Talent
Affording the right people is one challenge, finding them in the first place is another. With almost exponential growth rates in the early years, **ensuring there is a strong pipeline of people is hugely important otherwise growth and innovation will be stunted.**

4 Tax Relief
Financial incentives can be used to drive innovation. R&D Tax relief has been used with success to do this, in 2018 alone Monzo received £4.2m in tax credits (Monzo Bank Limited, 2019). To further growth, **awareness and accessibility of tax relief schemes should be prioritised to further the growth of the digital economy.**

Tech B
Cyber Security

What is it?

The Government defined Cyber Security as `The protection of internet-connected systems (to include hardware, software, and associated infrastructure), the data on them, and the services they provide, from unauthorised access, harm or misuse. This includes harm caused intentionally by the operator of the system, or accidentally, as a result of failing to follow security procedures or being manipulated into doing so' (Department for Digital, Culture, Media and Sport, 2021).

As the globe becomes more digitised, the volume of connections and content increases (McKinsey & Company, 2016). The speed, scale and breadth of who can access this information becomes ever more important. By 2025 it's predicted that the volume of data/information created, captured, copied, and consumed worldwide will reach 181 Zettabytes (Statista, 2021).

With much of this information containing sensitive and confidential information there is a need to place and maintain digital boundaries, to protect from the increasing sophistication of attacks.

Where are we now?

Nationally the number of Cyber Security firms are increasing, there are now 1,483 firms offering Cyber Security products or services in the UK. Between 2017-2020 the sector has added over 3,800 jobs, and revenues have grown by 7% to £8.9bn (Department for Digital, Culture, Media & Sport, 2021).

In 2020, external investment into the sector hit of £821million. Matt Warman MP, Parliamentary Under Secretary of State, Minister for Digital Infrastructure said the following about Cyber Security; "The sector is growing and diversifying, solidifying its status as a jewel in the UK's economic crown" (P5, Department for Digital, Culture, Media & Sport, 2021).

The UK is a global leader in Cyber Security and has the largest market in Europe, British exports are expected to rise to £3.2bn by 2023 (Department for Digital, Culture, Media & Sport, 2021).

Geographically, in contrast to Fintech, Greater London and the South East only houses 23% of Cyber Security firms with the North attracting significant investment and centres of global excellence such as the GCHQ facility `placing the city at the heart of the nation's cyber security effort'. The North is also the home to a newly created National Cyber Force, representing a $5bn investment (Department for Digital, Culture, Media & Sport, 2021).

The North also contains a breadth and depth of expertise; North East, Greater Manchester, Lancashire, Sheffield & South Yorkshire, York and North Yorkshire all house Cyber Security as sub-sectors of their digital economies. However there are still challenges; research found that in 2021, 50% of UK businesses have a basic Cyber Security skills gap, and 33% have an advanced technical skills gap (Department for Digital, Culture, Media & Sport, 2021).

Where could we be?

The Cyber Security market is growing at a rapid rate. By 2024 it's predicted that worldwide spending on cyber security will reach $174.7bn (IDC, 2020), with security services accounting for the fastest-growing market segment. The pandemic has fuelled this growth by triggering a 'permanent shift' in the way that businesses operate, further pushing personal and commercial demand (Rafferty, 2021).

The magnitude and commitment of the UK Government is significant and pursues a central aim, 'for government's critical functions to be significantly hardened to cyber-attack by 2025, with all government organisations across the whole public sector being resilient to known vulnerabilities and attack methods no later than 2030.' (Cabinet Office, 2022).

The National Cyber Force has been located in the North, this has created and will sustain many highly skilled jobs. There is the opportunity to build on the investments that have already been made to strengthen the cluster, innovate and accelerate the skills base and infrastructure that the North has to offer the UK and further afield.

Economic benefits

A report published in 2018 estimated that the global cost of Cybercrime is about $600bn and was not showing any signs of slowing down, this is nearly 1% of GDP. The report attributes the growth to cyber-criminals quickly adopting new technologies and the ease of cyber-crime growing as actors leverage black markets and digital currencies (Lewis, 2018). If the effectiveness of Cyber Security can increase, and outpace, the sophistication of attacks there is an enormous opportunity to bring greater global stability and productivity to the economies of the world.

These growing challenges and needs, if addressed, could lead to widespread economic gains. The North has the hubs, infrastructure and momentum to continue advancing the capabilities of the UK.

Social benefits

Safeguarding information helps individuals, organisations and society function and progress positively. Some of the benefits of implementing Cyber Security include (Shea et al);

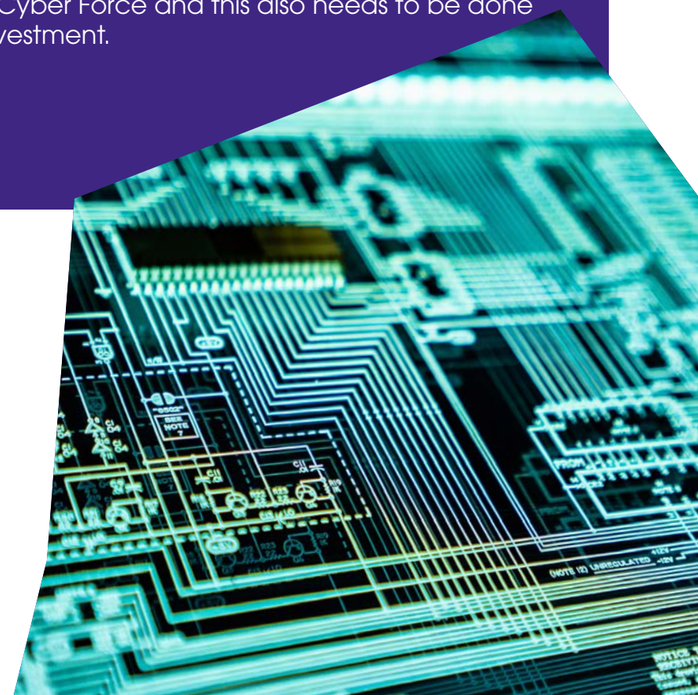
- Business protection against data breaches
- Protection for data and networks
- Prevention of unauthorised user access
- Protection for end users and endpoint devices
- Regulatory compliance
- Business continuity
- Improved confidence in the company's reputation and trust for developers, partners, customers, stakeholders and employees

What's needed to further these benefits in the North?

There are two core areas that are needed to further the UK's role as a global leader in Cyber Security, these are; advocacy and investment.

1 Advocacy
There needs to be a championing of Cyber Security across government. The National Cyber Strategy 2022 lays out that "All ministers play a role in ensuring that the UK cements its position as a responsible and democratic cyber power, able to protect and promote its interests in and through cyberspace" (Cabinet Office, 2022). **The North needs to build on the progress made and address the skills gap providing scaleups with the talent needed for them to safeguard themselves and their customers.**

2 Investment
Technology moves at a rapid rate and investment needs to keep pace. The government will be investing £2.6bn in cyber and legacy IT over the next three years (Cabinet Office, 2022). This is in addition to significant investment in the National Cyber Force and this also needs to be done alongside private sector investment.



Tech C
HealthTech

What is it?

HealthTech is defined by Beauhurst as "the use of technology (databases, applications, mobiles, wearables) to improve the delivery, payment, and/or consumption of care, with the ability to increase the development and commercialisation of medicinal products." (Beauhurst, 2022). In short, HealthTech involves using data, software and other technologies to support healthcare.

Where are we now?

Globally HealthTech is growing rapidly and the UK has a strong presence. It was third in the world for HealthTech investment raised in 2020, although significantly behind the United States ($38.6bn) and China ($12.2bn), venture capital investment into UK HealthTech reached a record high in 2020 at $2.33bn (Tech Nation, 2021).

Europe is the highest growing region for HealthTech with London being the leading hub. The UK HealthTech growth is being driven primarily by the Golden Triangle of London, Oxford and Cambridge (UKTN, 2021).

There are over 3,000 startups and scaleups operating in healthtech in the UK, of which around 400 have recorded high growth over the past two years (20% year on year growth). There is high demand for skilled employees with almost 10,000 jobs being advertised by HealthTech scaleups in early 2021 (Tech Nation, 2021).

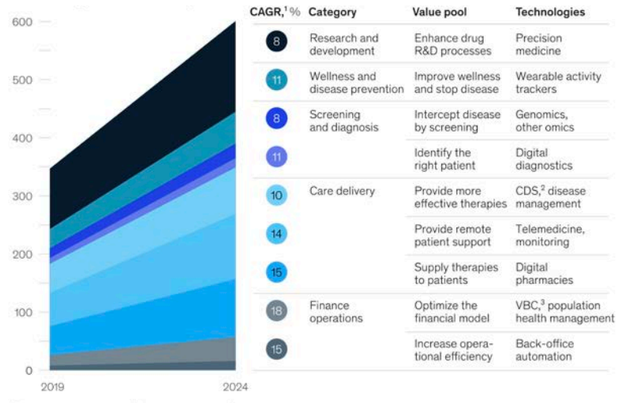
Strong clusters of HealthTech are present in the North, with Leeds coming in at 3rd place, Manchester 4th and Liverpool 10th in the biggest in the UK (Bruntwood, 2021). The North of England now has more Medtech (a sub-sector of Healthtech) businesses than the "golden triangle" (Lovell, 2019) and northern HealthTech companies have raised almost £110m.

Across the North, the life sciences sector represents a significant national asset and is a major contributor to the innovation landscape (NHSA & NP11, 2021). The North is host to world-class research and expertise and well-established partnerships with universities, NHS and social care (Ibid). Research highlights that data-intensive innovation has in healthcare taken a huge step forward amid the pandemic with vaccine development and trials.

Where could we be?

The biggest wave for consumer digital healthcare marketplaces is yet to come. Global healthcare spending is $7.8T, with just a small proportion associated with startup and scaleup activity. HealthTech can be divided into 8 value pools, these are expected to grow annually at least at 8% per annum, the R&D category represents the single largest value pool by market size ($109bn in 2019) (McKinsey & Company, 2020).

Figure 4: Estimated global market size in $ (McKinsey & Company, 2020)



CAGR,[1] %	Category	Value pool	Technologies
8	Research and development	Enhance drug R&D processes	Precision medicine
11	Wellness and disease prevention	Improve wellness and stop disease	Wearable activity trackers
8	Screening and diagnosis	Intercept disease by screening	Genomics, other omics
11		Identify the right patient	Digital diagnostics
10	Care delivery	Provide more effective therapies	CDS,[2] disease management
14		Provide remote patient support	Telemedicine, monitoring
15		Supply therapies to patients	Digital pharmacies
18	Finance operations	Optimize the financial model	VBC,[3] population health management
15		Increase operational efficiency	Back-office automation

The sector continues to grow and the COVID-19 crisis hasn't reduced investor interest. Nevertheless, there is a opportunity to harness the potential of digital technologies to empower healthcare. Using data to create a well curated system across the North would allow for a change in how research is conducted and would transform the lives of patients and the industry (NHSA & NP11, 2021).

HealthTech companies need significant capital to grow quickly. Currently, much of this spend is not in the North. However, given the regional hubs identified there is no reason the North can not create it's own triangle. If the North is able to dramatically increase investment in R&D the compounding effect of innovation and growth breeding growth would act as an economic catalyst for the area.

To succeed in the next 10 years, the North needs to build & attract scaleup companies that will increase the value, decrease the costs and will have scalability at their core, this will separate the field when it comes to investment (Deloitte, 2021).

Economic benefit

The economic potential for HealthTech is enormous, in an increasingly digital world the tech that enables this presents a huge opportunity. Venture capital investment into UK HealthTech reached a record high in 2020 at $2.33bn. The UK was third in the world for HealthTech investment raised in 2020, behind only the United States ($38.6bn) and China ($12.2bn). HealthTech investment was second only to Fintech in 2020, making up just under 12% of all investment into UK tech firms.

The North only attracts a small amount of this investment but it has demonstrated that HealthTech companies can succeed and thrive. In the North it is possible to attract and grow talent and create the ecosystems needed raise significant capital. As HealthTech emerges and evolves the North can present the reason and opportunity to become a destination for companies to locate and thrive.

Social benefits

The next decade brings with it an immense opportunity to continue to transform lives. Digitisation of healthcare has been increasing in recent years and then it was expedited by COVID-19 (Novorol, 2020). A recent McKinsey report shows that it is time to take advantage of HealthTech, with a growing body of evidence that digital interventions can improve health outcomes across a range of therapeutic areas (such as diabetes, asthma, and coronary disease) (McKinsey & Company, 2020).

What's needed to further these benefits in the North?

1 Inward investment is driven by R&D activity, **this should be prioritised within the North with a particular focus on remote patient support (McKinsey & Company, 2020) and the decentralisation of data using digital technologies (NHSA & NP11, 2021).**

2 Companies are increasingly shifting from competitive to collaborative, and in the process, unlocking value through complementary skills, capabilities and operational efficiencies (McKinsey & Company, 2020). **The North needs to prioritise this, support and create ecosystems for this to occur. This could be done through a range of vehicles including mergers & acquisitions, joint ventures, alliances and partnerships. This should be encouraged with regional hub and ecosystem development.**

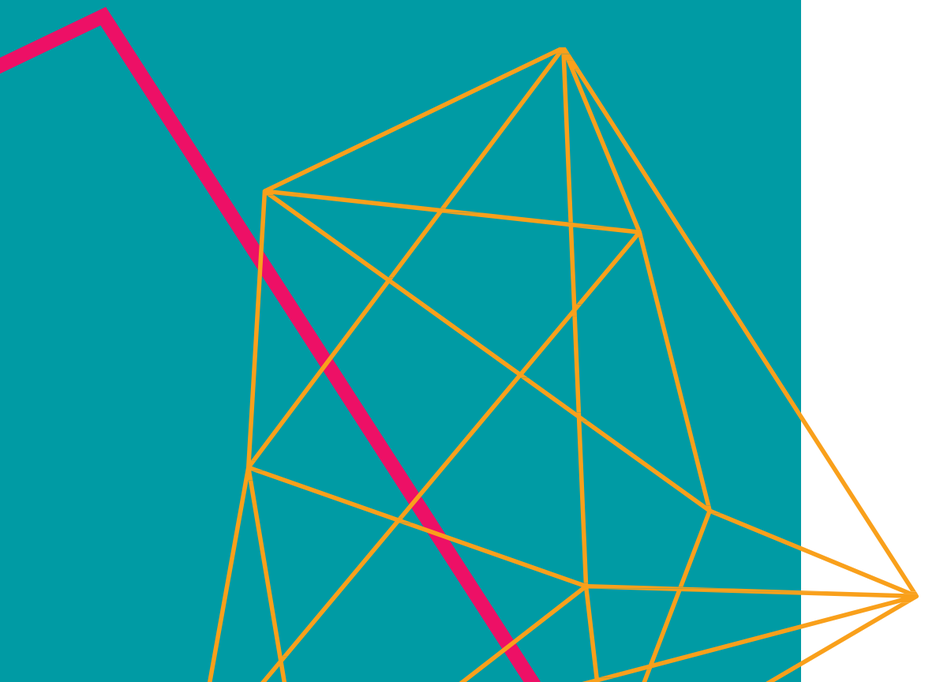
3 **The North also needs to support the creation of scaleups** to ensure they are equipped in the sector as according to Mckinsey & Company (2020) to succeed in digital health, players must be nimble, flexible, and fast.

Tech D
Big Data Analytics

What is it?

"Big data" refers to data sets that are too large or too complex for traditional data processing applications. The term is often used to refer to predictive analytics or other methods of extracting value from data (Statista, 2022).

As the proliferation, accessibility and sophistication of technology grows so does the amount, and detail, of data that is recorded. Big Data Analytics is the process by which sense and value are extracted from the otherwise overwhelming volume and complexity.



Where are we now?

Big Data Analytics (BDA) has become even more important following the outbreak of COVID-19 as it's being used to work out the global impact of the pandemic.

Research shows that 90% of the world's data has been created in the last 2 years (Markets and Markets, 2021), with the rapid rise in digitalisation globally, data is being generated at an unprecedented speed. The global Big Data Analytics (BDA) market was worth $162bn in 2021, with every click, swipe and interaction being recorded and stored.

The insight shared by each region in the North, shows that BDA is present in 10 out of 11 Northern regions; Cumbria, Tees Valley, North East, Greater Manchester, Lancashire, Cheshire and Warrington, Liverpool, Sheffield and South Yorkshire, Hull and East Yorkshire, Leeds and West Yorkshire.

From an academic perspective, 3 of the top 10 universities in the UK to study BDA are based in the North (Edvoy, 2021) and from an employment perspective, some of the UK's top Data Analytics companies based are there, found in Leeds & York (Clutch, 2022).

Where could we be?

Public and private data contains an enormous value. The National Data Strategy reinforces the requirement to access and interrogate government data more effectively to improve services (UK Authority, 2020).

The Big Data market is growing. In 2021 its value was $162.6bn and by 2030 the projected global value will reach $614.82bn (GlobeNewswire, 2021). This represents a significant global opportunity. This is the primary market when extrapolated to the impact this can have, this is even more significant.

By 2030 data will be considered a decision-maker, an influencer and an input to our actions (WPP, 2020), not just a record of what has happened. It's also anticipated that by 2030 data will be foundational to business decisions and data experts will be required in every department. As a result, we are likely to see the first data professionals rise to CEO positions (McKinsey & Company, 2017).

Big Data Analytics provides a big opportunity for every company in the digital economy in the years to come (O'Brien, 2020). It has the opportunity to drive operational efficiency, reduce costs, streamline operations, drive business growth, profitability and contribution to the UK economy.

With the market forecast to almost quadruple by 2030, if the North can realise, even 1% of this growth opportunity, it would create an opportunity worth $6.1bn. The North also needs to retain a higher degree of the world class talent it's creating, if it did, this would significantly impact the pipeline of highly-skilled talent and opportunity in the North.

Economic benefits

Although the market for BDA is expected to grow significantly, the opportunity for wider value creation is immense. A McKinsey report in 2017 found that companies that use data to optimise their supply chains and operations increase profits in the range of 6% (McKinsey & Company, 2017). If BDA is adopted throughout the market the uplift in profitability would be enormous. These profits could then be reinvested into innovation, new jobs, acquisition and many other highly beneficial activities for the ecosystem. The net effect on productivity and efficiency would be immense.

BDA has opportunities in the public and private sectors. Within Government, it's expected to unlock innovation (HM Government, 2014) as well as better decision making throughout organisations as information can be distilled more quickly and more accurate models developed (Data Analytics, 2019).

There is limited insight into how much economic contribution comes from which region in the UK, it is clear that BDA is prevalent throughout almost every region in the North. The economic benefits can be maximised but this requires a significant infusion of talent into the industry and region.

Social benefits

McKinsey Global Institute estimates that BDA could generate an additional $3 trillion in value every year in just seven industries (Kennedy).

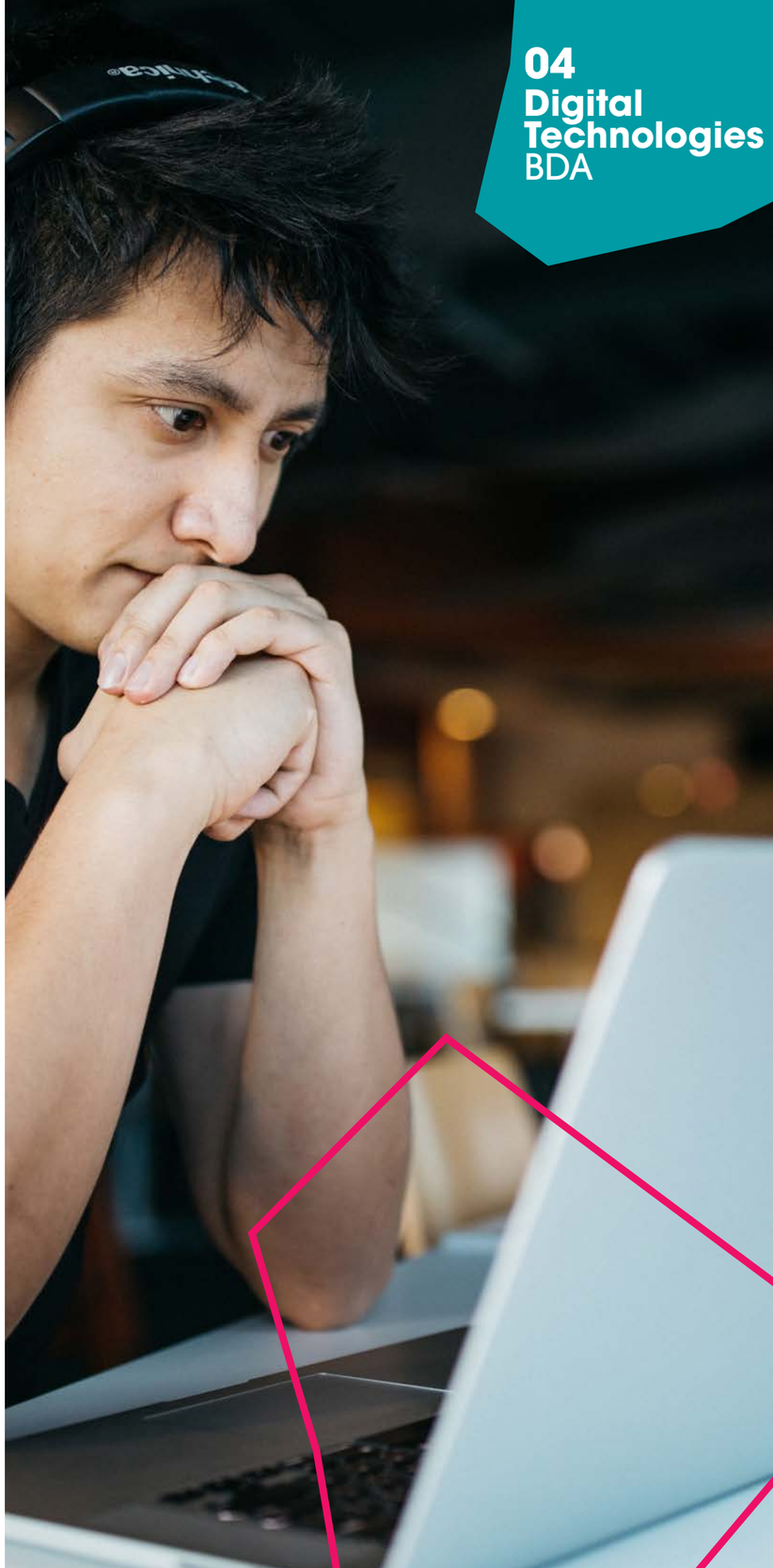
Turning BDA into actionable information for learning health systems is core to integrated care systems, a success for the health and life sciences sector (NHSA & NP11, 2021).

BDA requires a high level of skill, the emergence of the sector also creates an opportunity for highly-skilled roles. In UK companies there are between 178,000-234,000 data-related roles to be filled. Compounding this, the Higher Education Statistics Agency found that the supply of data scientists from UK universities is unlikely to be more than 10,000 per year (Department for Digital, Culture, Media & Sport, 2021), this creates a significant void, but also an opportunity to accelerate training and development across the UK.

The North can make a dent, but it can not solve the challenge. Collaboration across all levels of education are needed to capitalise on the rate of market growth.

What's needed to further these benefits in the North?

- A recent study showed that 95% of employers found it difficult to find the right skills and talent (Anthony, 2022) and similarly, 95% of businesses find unstructured data a problem (Milenkovic, 2019). **To take full advantage of the market opportunity the North needs to invest in greater education, adoption and investment into Big Data Analytics - ensuring that the talent pipeline has the capacity to serve the needs of businesses is key to unlocking operational efficiencies and driving up profitability.**

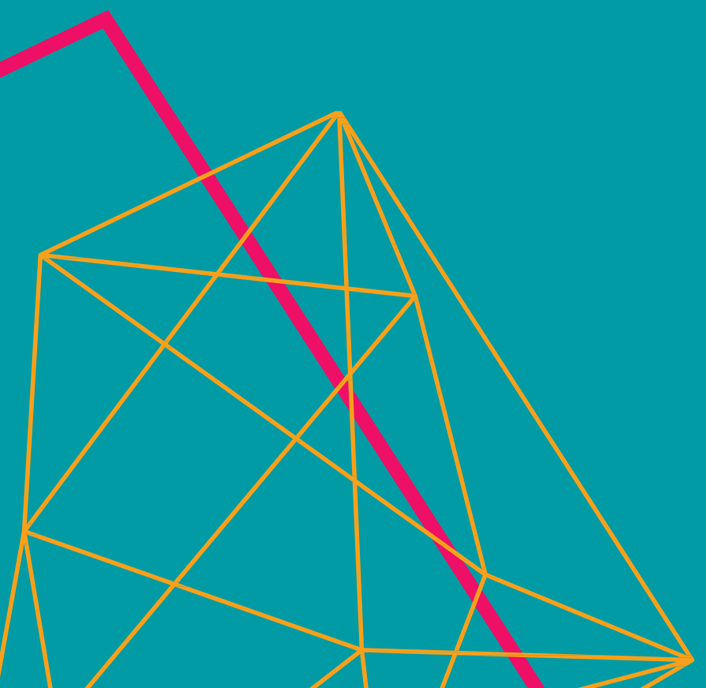


Tech E
Artificial Intelligence

What is it?

In a report by Capital Economics, the DCMS stipulate that 'Artificial Intelligence refers to the simulation of human intelligence processes by machines; it is a technology process that can learn from experience' (Capital Economics, 2022) although concluding that there is ambiguity with the generalised definition of Artificial Intelligence (AI).

Generally speaking, there are three well-used definitions of what AI encompasses, these are; Qualitative-based, Usage-based or Technology-based (Capital Economics, 2022, p.10).



Where are we now?

The global AI market is more mature than Big Data Analytics, however, it is also still rapidly evolving and growing. In 2021 the estimated global market size was $327.5bn (Statista, 2022), with the value of it in 2020 to the UK being £15.6bn (Garcia, 2020). The UK is in a period of growth, by 2035 AI is expected to add $880bn to the UK economy. Its importance is also being recognised by public and private investors. UK AI investment was almost double the rest of Europe combined and on a global investment level, the UK is third, only after the US and China for AI (International Trade Administration, 2021).

The public sector is also investing heavily; in 2019 the UK Government published an AI sector support deal worth nearly £1bn (International Trade Administration, 2021).

AI technology has been adopted by around 15% of all businesses, of those that haven't there is an increasing likelihood that they will as they scale, starting with 15% of small companies, 34% of medium-sized companies and 68% of large companies (Capital Economics, 2022). However, the scale is skewed as there are far more smaller companies.

AI is a sub-sector present in 10 out of 11 Northern regions: Cumbria, Tees Valley, North East, Greater Manchester, Lancashire, Cheshire and Warrington, Liverpool, Sheffield and South Yorkshire, York and North Yorkshire, Leeds and West Yorkshire.

Where could we be?

The rulebook is constantly being re-written with what is possible, and how the industry manifests itself. Of all the digital technologies, AI is the fastest growing. With this, comes the opportunity to drive high levels of economic growth that will impact all areas of life. The National AI strategy found that 'The UK is a global superpower in AI and is well placed to lead the world over the next decade as a genuine research and innovation powerhouse, a hive of global talent and a progressive regulatory and business environment.'

The economic landscape could be transformed by AI with huge social and economic benefits across the country. Growth is predicted to reach £62.5bn by 2030 and add substantially more to the UK economy (Department for International Trade).

The North is taking steps to place itself as a beacon in the UK. The 2022 Great Northern AI summit will bring together 50+ experts and explore 15 themes over 2 days. With higher levels of advocacy and working as a collective, the North could place itself at the heart of the UK's AI scene.

Economic benefits

Research by the McKinsey Global Institute, found that AI technologies can have a significant positive impact on productivity and economic growth (McKinsey Global Institute, 2019). Public and private spend are key influencers when it comes to innovation, for the businesses that have already adopted AI, they spent on average; £9,500 per small businesses spend, £380,000 per medium businesses and £1.6m per large businesses (Capital Economics, 2022).

A study by PwC indicates that the impact of AI could be £204.5bn to the UK by 2030 (PwC, 2017). If the North's GVA (22%) contribution to the UK economy is reflected in this opportunity this represents a value of almost £45bn.

Social benefits

AI has enormous potential to touch all areas of society, AI is already being trialled in a range of scenarios from diagnosing cancer to helping blind people navigate their surroundings, identifying victims of online sexual exploitation, and aiding disaster-relief efforts (McKinsey & Company, 2018).

As AI adapts, evolves and emerges so do new areas of application. AI will help to make better decisions and drive greater efficiencies. The North can take advantage of the opportunity, this would result in an increase in spending power of £1,800-£2,300 per household (PwC, 2017).

What's needed to further these benefits in the North?

AI offers immense benefits and opportunities but in order to take advantage of these the biggest challenges to be addressed are;

1 **Financial -** Engaging with AI comes at a cost, the procuring factors and then the continued operational costs can create a significant barrier to adoption (Capital Economics, 2022)

2 **Skills -** Shortages of talent constrain the development of AI and limit it's application for good (McKinsey & Company, 2018)

3 **Data -** In order for AI to be effective the quality of the data being worked with is fundamental to any outcomes, ensuring this data is of sufficient quality is a key challenge (McKinsey & Company, 2019)

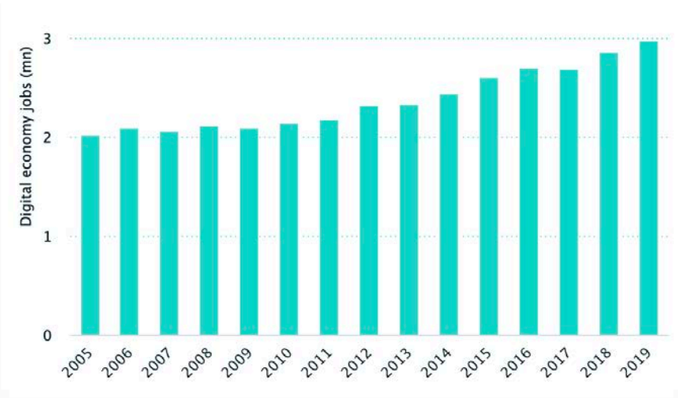
05 Digital Demand

The Digital Demand

The digital economy is in high demand. Nationally the demand for digital is outstripping supply, with 1 in 10 of all UK job vacancies now tech jobs (Tech Nation, 2020). However, the digital economy is broader than tech or digital roles, around 37% of employees are in non-digital roles, such as HR, marketing, legal, and compliance so this figure is not reflective of the true reality (Tech Nation, 2020).

The ability to create and grow the digital workforce is crucial to the ongoing success of the UK's digital economy. On an international level, the digital economy will continue to strive forward and the UK has the opportunity to continue to be a global leader in this domain. Central to its contribution is the ability to create or bring in the skills and finance needed. At the moment these are the two most significant bottlenecks in the UK's ambition for growth.

Digital innovation will cumulatively increase revenue across the UK to £276bn by 2026 and has the capacity to reach £1.12 trillion by 2030 (Public Policy Projects).



Source: Business Structure Database and Annual Population Survey, 2005-2019

Note: Figures vary to Tech Nation Reports due to revisions made based on 2017 population estimates.

Figure 5: Digital economy jobs increase by 40% from 2017 to 2019 (Tech Nation, 2021)

Digital transformation

The impact of Covid-19 has resulted in a greater demand for digital, not just in terms of digital skills but also for the transformation of traditional industries. Digitisation is growing in all sectors and manufacturing is not only a promising area for the North but also a prime capibility with a emphasis on materials and processes (NPIER, 2016).

Advanced manufacturing

The digital transformation in manufacturing focuses on improving operational efficiency, reducing costs, improving quality and allowing for a quicker reaction to supply and demand.

Having been at the heart of the industrial revolution, the North continues to play a key role in the UK's manufacturing landscape and is home to many manufacturers such as Nissan Motor Manufacturing Ltd and Parity Medical, who are utilising digital technologies to solve solutions to traditional manufacturing issues.

The North is already making proactive progression in the transformation of manufacturing with the Made Smarter initiative, which runs programmes for SMEs to connect UK manufacturers with the digital tools, innovation & skills needed to make an everyday difference in their operations. The Advanced Manufacturing Research Centre, based in Sheffield, works to transform industrial and economic performance of companies around the globe.

The North has a strong infrastructure in place to be the gateway to not only the rest of the UK but also to Europe with 7 international gateway and 12 foreign trading points (Great.Gov.UK, 2022).

Manufacturers need to continually evolve to keep up with the change in pace in demand and unforeseen disruptions or opportunities. The North can continue to play a pivotal role in the digitisation of manufacturing to meet these.

Opportunities for the digital economy of the North in advanced manufacturing include:

- Supporting the next generation of digital technologies in manufacturing with funding for research and business support programmes. This will allow for the development of new materials, a prime capability for the North as highlighted by the Northern Powerhouse independent economic review (NPIER, 2016).

- Supporting the pipeline of talent by working with the education system to continually invest in the development and upskilling of digital skills.

- Leveraging the strong clusters, national assets and infrastructure already present across the North to allow for the translation of research expertise into commercial activity (Ibid).

Collectively for the North

The Offer

The North has significant opportunities to offer the UK if taken advantage of. These include:

1 **National Assets:** The parts of the digital economy identified in this report are found in strength in the North. These have attracted significant public and private funding and have created immense value for the North and the wider economy. These national assets can, and should, be leveraged on an international scale to draw further investment, R&D and job creation.

2 **Clusters:** The North contains a set of very strong clusters that are extremely valuable to the digital economy of the UK. They act as a catalyst, driving innovation, success, productivity and growth. There are learning opportunities to draw out lessons on what makes these such a success and how these can be replicated. The clusters amplify the success of the whole.

3 **Growth potential:** The North has the potential to expand and take advantage of a vast array of economic and social opportunities, the developing infrastructure and connectivity means that it's never been easier to start and scale a digital business in the North.

The Ask

Alongside the North's offer, there are challenges that need to be overcome. These include:

1 **Investment:** In 'State of the North' it was found that there were consistent mismatches between expectations of funding/support that had been promised and the reality of affairs. Public funding is a catalyst for private investment, which in turn creates jobs, growth and productivity. Much of the investment landscape is still dominated by London and the South East. The North's share of investment needs levelling up to meet the scale of the opportunity identified. A rebalancing in R&D spending is needed (IPPR, 2022).

2 **Autonomy:** The clusters that make up the digital economy of the North have differing risks and opportunities. Local civic and business leadership is needed to maximise the value of these clusters. If decisions are made by central Government and decision making is not devolved there risks being a 'one-size-fits-all' approach. This is less effective and more inefficient as devolution deals are still needed across parts of the North.

3 **Education:** In almost every area of the digital economy talent was a bottleneck stifling the vision for businesses to realise their ambitions for growth. Simply put, there aren't enough people with the skills needed to maximise the opportunity that the digital economy presents the North. The digital economy is lagging behind when it comes to representation across gender and ethnicity. Without comprehensive digital literacy coming from schools, the skills divide widens and amplifies, further reducing the pipeline.

06 The North Star

What it is

The North Star is a statement of intent that sets the trajectory for the Digital Economies of the North. It serves as a guiding principle to underpin the recommendations of the Digital Proposition. It is this;

"The Digital Economy of the North should level up to support the UK's ambition of being a world-class digital leader. By 2030 the growth of digital scale ups in the North should drive the contribution of an additional £10bn to the UK's economy."

How it's been reached

The process of deriving this was a collaborative effort between the Chief Executives, Digital Leads and Innovation Leads of the Northern LEPs.

The qualifying factors for choosing the statement were that it needed to be:

1. **Usable**: It had to be something functional that people and organisations could create change with.
2. **Specific**: It had to be something that could be pinned down and measured, this allows progress to be tracked and a degree of accountability.
3. **Shared**: It needed to represent the viewpoint of the North.

The underpinning logic behind the statement was as follows;

The Digital Economy of the UK is already one of the best in the world, it's fourth after the US, China and Japan (Consultancy.uk, 2021). It's not a new ambition for the UK to be a world leader, but we do want to recognise and sustain this ambition.

The time-line of 2030 aligns with the Government's 2030 'Levelling up' missions (Department for Levelling Up, Housing & Communities, 2022).

All digital companies are not equal, with scaleups accounting for less than 1% of UK companies but contributing more than 50%, or £1.1trn of the UK SME economy (Scaleup Institute, 2021). Supporting the flourishing of these companies creates a disproportionate return on investment.

The OECD defines a scaleup as a company as one that has achieved growth of 20% or more in either employment or turnover year on year for at least two years, and has a minimum employee count of 10 at the start of the observation period (Tech Nation, 2019).

Nationally there are 33,445 businesses classed as scaleups, with an average turnover of each of these businesses at £32.6m. The North accounts for 20% of all scaleups, and of those scaleups, 14.4% are in the digital economy (Scaleup Institute, 2021). This creates a collective turnover of the digital scaleups in the North at £21.8bn.

If the growth and support of these companies can be accelerated by just over 45% the additional contribution from the digital economy of the North will be an additional £10bn.

07 Enabling Factors

Enabling factors

For the Digital Economy of the North to flourish it can not be viewed in isolation. There are three primary underpinning factors that contribute to the success of this, they are; Infrastructure, Innovation and Education. In keeping with the North Star, a statement of intent was also drawn up for the North to align behind.

Infrastructure

"Infrastructure in the North should connect people to each other, people to businesses and businesses to markets encourage economic activity, community prosperity and diversity across industrial, urban and rural areas through full-fibre broadband to every home by 2030".

The national commitment is for 15 million premises to have access to full-fibre connectivity by 2025, and to build a UK-wide full-fibre network by 2033 (The Northern Powerhouse Partnership). In 2016, full-fibre broadband across the UK was at 6.2% (Department for Digital, Culture, Media & Sport, 2019).

The importance of the fifth generation (5G) of cellular technology infrastructure is a major component of industry digitisation. This next generation of mobile cellular network technology is a step change in speed, capacity and reliability for both machines and people. The digital connectivity is estimated to deliver a £43 billion boost to the UK economy by 2030 (PWC,2021).

5G is set to revolutionise the way and speed at which people communicate and work, it will enable greater assurance in the development and delivery of online services for the public and private services.

The digital economy needs this infrastructure to thrive, without it, the North will be hamstrung to realise it's ambition. Full-fibre will facilitate relocation, flexible working and the enablement of digital opportunity.

Innovation

"Innovation in the North should drive an increase of investment in R&D. Spending per head in the North should increase to 2.5% of GDP by 2030. Enabling greater development and diffusion of world-leading technologies that transform existing industry, create higher competitiveness and productivity.

The UK R&D system is world-leading and R&D investment plays an essential role in fostering innovation in the least productive firms and peripheral areas and this is especially so in knowledge-intensive services sectors (Department for Business, Energy & Industrial Strategy, 2021). The UK Government's target for Public and Private R&D investment is to move from 1.74% of GDP to 2.4% of GDP by 2027 (House of Commons Library, 2021, p.11).

A key finding on drivers of innovation in the UK was "that private R&D investment successfully fosters firms' innovations, in particular in relation to process innovation as well as in relation to new-to-business and new-to-market innovative products" (Department for Business, Energy & Industrial Strategy, 2021).

Of all the R&D investment performed in the UK, the business sector is the largest funder. In 2019, it funded £20.7bn (54%) of R&D. Public sector funding for R&D was £10.45bn in 2019, 27% of the total (House of Commons Library, 2021).

Although the ambition for R&D is strong, the equity of the investment is not, currently the average across the UK is 1.74%, the North is significantly behind this at 1.01%.

Committing to raise R&D investment in the North will drive innovation in the digital economy, creating highly skilled jobs, lauching new products and services.

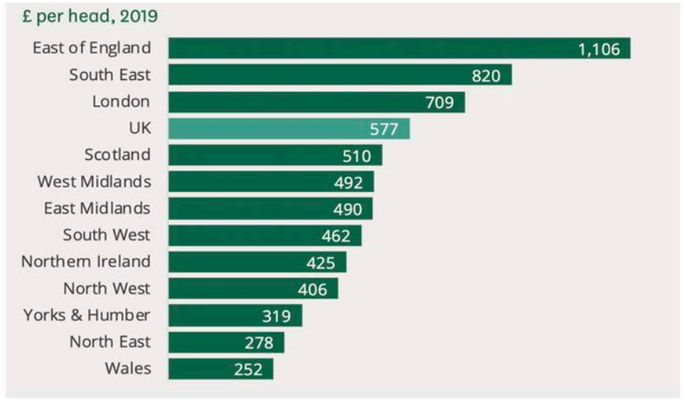


Figure 6: R&D Performed by country per head (House of Commons Library, 2021)

Education

"Education in the North should bridge the digital skills divide. By 2030 every child will be digitally literate when they leave full-time education for the benefit of employers, communities and individuals."

In 2017, DCMS published the UK Digital Strategy. The strategy argued that "for the UK to be a world-leading digital economy that works for everyone, it is crucial that everyone has the digital skills they need to fully participate in society" (House of Lords Library, 2017).

The skills gap is significant, in 2020 a survey was conducted of UK businesses and found that 69% believed that their company had a digital skills gap and 44% were worried that this would have a negative impact on their success in the next 12 months (The Parliamentary Office of Science and Technology, 2021).

Education is crucial for ensuring a strong pipeline of talent can support, sustain and take advantage of the potential for growth in the UK's digital economy. More than half of primary and secondary school teachers in the UK think the school curriculum "does not equip children with the literacy skills they need" in the digital age (National Literacy Trust, 2018).

The rationale isn't just a social one, the economic benefits are predicted to be significant. In 2019, a study commissioned by the Good Things Foundation estimated that the UK could get a return of £15 for every £1 invested in digital skills (Good Things Foundation, 2018).

By committing to bridge the digital skills divide, the North will create a pipeline of future consumer and contributors to the digital economy. With the growing opportunity the magnitude of getting this right positions the North to take advantage of the economic and social benefits.

08
Unlocking potential for the Northern Digital Economy
Policy & Recommendations

Nationally

On a national level, there is a lot of existing policy that influences the digital economy. However, with varying definitions and categorisations of what the make up of what the digital economy is, and what it isn't. There are SIC and SOC codes, as well as definitions like the one we're using in this report, defined through academia, the public and private sector, they are not comprehensive or conclusive. The policy and recommendations also vary.

In 2021 the UK Government published its digital strategy, which contains 10 priorities;

1. Rolling out world-class digital infrastructure nationwide
2. Unlocking the power of data
3. Building a tech-savvy nation
4. Keeping the UK safe and secure online
5. Fuelling a new era of startups and scaleups
6. Unleashing the transformational power of tech and AI
7. Championing free and fair digital trade
8. Leading the global conversation on tech
9. Levelling up digital prosperity across the UK
10. Using digital innovation to reach Net Zero

A focus on scaleups

Given the scope of this report, the potential for growth will be unlocked when the right conditions for scaleup businesses to grow are prioritised and created. If this is delivered, then the rest of the strategy should have been incorporated in one way or another.

Action is needed to reverse the trend of the decreasing number of scaleups, in 2019 there was a fall of 11%, although this has flattened off to 1% (Scaleup Institute, 2021). The Scaleup Visa has and continues to be a big step forward to allow scaleups to access the best global talent. Capital for scaleups is crucial. Continued work is required to support businesses to access finance, through deployment bodies such as the British Business Bank and Innovate UK (Scaleup Institute 2021) in order for them to continue their operations in the UK and take advantage of growth opportunities.

The scaleup institute remains fixed on the following governing principles (Scaleup Institute, 2021);

- **Leverage and build on what works** – it is important for new initiatives to not crowd out existing ones with proven impact. To move the needle on scaleup growth, we need at scale, long term sustainable interventions, deployed at a regional level;
- **Align people and funding resources** to the scaleup and growth sectors championing their case and creating change. There are many policy initiatives underway that have the potential to substantially improve the UK business environment for scaleups. However, it is essential for the myriad of initiatives to be aligned to have maximum impact, and to avoid the development of a confusing landscape for businesses;
- **Build clusters and hubs** – at a local level – connecting our scaleup communities to the talent, finance and markets that they need to propel their growth. Creating these meeting points, be it for peer to peer networks, to connect businesses to corporates or to financiers, or simply providing the right space to grow, is crucial.

Existing policy

Insight from DCMS shows that the Government has set a target of nationwide full-fibre coverage by 2033 and that the majority of the population will be covered by a 5G signal by 2027 (Department for Digital, Culture, Media & Sport, 2019).

The UK's Innovation strategy found that R&D investment and innovation could effectively foster productivity growth in peripheral regions and in lower-tech sectors. It suggested that policy needs to be informed by place-based considerations, in order to effectively contribute to the "levelling up" agenda aimed at a fairer and more inclusive economy (Department for Business, Energy & Industrial Strategy, 2021). This could be achieved not only by increasing the resources available to support R&D activities but also by fostering greater collaboration and partnerships, including the creation of networks between private companies, universities and research institutes across regions and industries.

Investment in digital skills and core literacy of young people is vital and so is the collaboration between `the public, private, and third sector through the Digital Skills Partnership` (Department for Digital, Culture, Media & Sport, 2021). The Digital Literacy Review published in 2021 found the following; "as institutions of higher learning, universities clearly have an important role to play in enhancing students' digital literacy to endow them with readily transferable skills, attitudes, and ethics that prepare them for a workplace that is fast being transformed by technology. It is important, however, that it is digital literacy in its truest sense that is nurtured in students" (The Consultancy, 2021).

The Media Literacy Strategy lays out that media literacy is a devolved policy across the UK (Department for Digital, Culture, Media & Sport, 2021).

The UK government is committed to raising R&D investment to 2.4% of GDP by 2027 (Department for Business, Energy & Industrial Strategy, 2021).

In the North

To realise the potential of the digital economy of the North the above must be taken into consideration, but in addition, there should be a focus on particular initiatives to create a digital economy which is nationally more balanced.

To achieve the North Star, there needs to be a continuation of existing solutions but also new ones to meet the needs of innovative scaleups. This needs to be delivered at a local level with the deliberate intention of reducing regional disparities. Insight from the 2021 Scaleup Institute report cited that access to talent and markets were the top two priorities for scaleups (Scaleup Institute, 2021). Over 46% of scaleups felt like there was very little support available for them and they also had the view that most financial advice is present in London and the South East (Scaleup Institute, 2021). The North needs to, and must, play a key role in addressing regional disparity in order to build a successful UK scaleup ecosystem.

To realise the potential of the Digital Economy of the North, Growth Hubs should work with regional SMEs to boost digital technology adoption and promote e-commerce, alongside private sector partners (Department for Digital, Culture, Media & Sport, 2021, p.186).

Collaboration

There should also be a higher degree of collaboration across regions to "share best practices on digital public services and to increase collective expertise in user research, human-centred design, and agile delivery" (Department for Digital, Culture, Media & Sport, 2021, p.187).

Finance

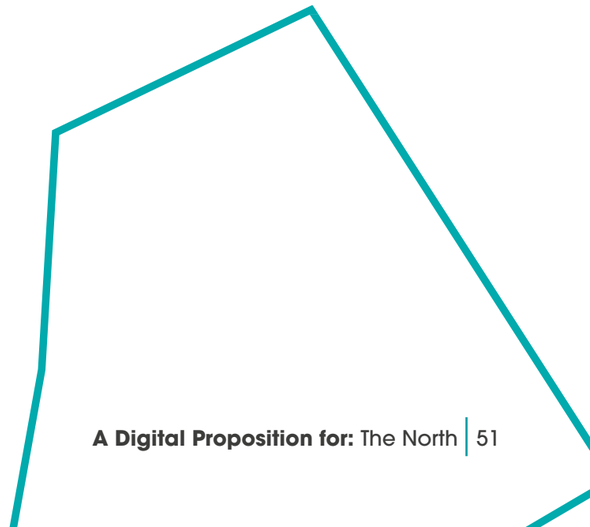
There is also a gap in finance that needs to be addressed. A recent report found that tech and digital firms who are looking to scale-up can access support and finance in the region (DCMS, 2021). However, much of the financial investment and support has been absorbed in London and the South East. The attraction and re-distribution of this is essential to drive Innovation. One of the outcomes for this is that "there are fewer start-ups per year in the North's major cities than elsewhere in the country. The North is considerably below the UK average for the number of patents per capita" (Northern Powerhouse, 2016).

Skills

In addition, ensuring the provision of skills keeps pace with business needs and skills are linked to the future economy of the North is crucial.

Primary and secondary schooling in the North contains a vastly disproportionate amount of schools meeting the threshold for long term disadvantage (The Northern Powerhouse Partnership, p.9). "Levelling up education outcomes" (The Northern Powerhouse Partnership), at a grassroots level, the education gap has increased during covid and this will be further exacerbated if catch-up is not a focal point.

Although the North is home to over 20 universities and 4 that are ranked in the top 100, the proposition of jobs in knowledge-intensive industries is less than the rest of England. If regions were able to `Level-up' to the same digital maturity as London there is the opportunity to create an additional £126bn of revenue by 2030 (Public Policy Projects, p.15).



Recommendations

The recommendations of this report will form the cornerstone of a programme of activity led by NP11, focused on developing the digital economy and connectivity of the North.

For interventions and activities taking place in the North, refer to the **Content Index document** which catalogues by region the support that is currently provided in the North targeted specifically at digital businesses.

For a closer review of each of the North's 11 regions' strengths, opportunities, and challenges within the digital economy, refer to the **Landscape Insight document.** This includes regional recommendations based upon the information provided as part of the primary research that individually will help the North reach its ambition of the digital economy.

A collaborative pan-Northern approach

To achieve the ambition of the North Star and three underpinning enablers, a pan-Northern approach needs to be adapted to help realise the opportunities and benefits available for not only the digital economy of the North but also nationally.

The recommendations stated in this proposition, provide clear call outs for actions that require attention from the North, actions that require partner support, and actions that need central government support.

Recommendations 1.

Commit to, and invest in the North's digital scaleups

Action for: Government, NP11 & Partners

The Digital Economy contribution to the UK's GVA is the fastest growing metric and scaleups represent the best return on investment. This should be the focal point for accelerated growth. Scaleups play a key metric in achieving the North Star as outlined in this proposition.

To achieve the North Star's ambition to drive £10bn to the UK economy by 2030, support for scaleups should be focused upon these key areas:

Support the drive to increase capital for scaleups through continued work to help businesses access finance so they do not have to move abroad to take advantage of growth opportunities. Increase access to public and private finance through the British Business Bank, Innovate UK, and other bodies.

Help align the myriad of funding resources available to digital businesses across the North to maximise impact and provide a clear landscape for scaleups to grow.

Prioritise investments in R&D and take action to build better relationships between businesses and R&D at Universities through a pan-Northern partnership with the higher education system and businesses at the forefront of the digital economy.

Take ample action to address the decreasing numbers of scaleups in the economy by driving support for entrepreneurial spirit through a pan-Northern pre-accelerator programme with focus on developing the entrepreneurial mindset and accelerator programmes targeted at scaleups.

Review the talent pipeline of the digital economy of the UK, as this will act as an enabler for growth for scaleup businesses not only in the North but also across the nation.

Recommendations 2.

Commit to and invest in the creation and growth of the Northern digital supercluster

Action for: Government, NP11 & Partners

As outlined in this report, there are five key sectors of the digital economy that if capitalised upon can not only put the North as a key supercluster of the Digital Economy of the UK, but can also help towards international recognition as a leader of technology and innovation. Connecting the digital community as a supercluster to talent, finance and markets propels growth and provides the right ecosystem for investment.

2.1 Fintech

Collaboration is key for scaleup Fintech businesses, therefore investment in the collaboration between institutions and businesses to further the opportunity of Fintech in the North is paramount.

Ensure the funding landscape is available and able to operate at the speed of the Fintech sector. Awareness and engagement with R&D tax relief is also a key area for businesses to take advantage to develop opportunities.

Support the Fintech hubs that are already operating in the North West, North East and across the North through programmes targeted at at skills, finance and business growth. Also ensuring that there is a strong pipeline of talent within the North to feed the rapid growth.

2.2 Cyber Security

Continue to support The National Cyber Force by leveraging existing centres of excellence to strengthen and build on investments that have already been made.

Support the advocation of the Cyber Security sub-sector by addressing the cyber skills gap providing scaleups with the talent needed for them to safeguard themselves and their customers through specifically targeted skills development programmes. In addition to supporting the investment of innovation across the North and encouraging private sector investment in Cyber Security.

2.3 HealthTech

Commit to supporting the HealhTech clusters already located in the North and maximise the collaboration and joining up of a super HealthTech cluster of the North.

Support the need for significant capital in the sector thus making the North a viable place for HealthTech startups.

Inward investment is driven by R&D activity, and this should be prioritised within the North with a particular focus on remote patient support and the decentralisation of data. The North needs to prioritise, support and create ecosystems for this to occur. This could be done through a range of vehicles including mergers & acquisitions, joint ventures, alliances and partnerships. This should be encouraged with regional hub and ecosystem development.

2.4 Big Data Analytics

To maximise market opportunity the North needs to invest in greater education, adoption, and investment into Big Data Analytics and ensure that the talent pipeline has the capacity to serve the needs of businesses is key to unlocking operational efficiencies and driving up profitability.

Encourage businesses to use data to optimise their supply chains and operations. by consequence this will push forward the sector's ecosystem whereby profits could then be reinvested into innovation, new jobs, acquisition, and many other highly beneficial activities for the ecosystem.

2.5 Artificial Intelligence

Support the funding landscape in the AI sub-sector to help businesses navigate the significant barriers to adoption.

Provide support to the digital skills shortage in the AI sector and uphold the quality of data available to businesses across the North to ensure that AI is at its most effective.

Recommendations

3. Increase capacity and scale for pan-Northern collaboration, partnerships, and investment

Action for: NP11 & Partners

Work with the national government to put in place pan-Northern partnerships and greater connectivity between academia and digital businesses.

Provide high-quality support for the industry from academia within the innovation and R&D area with clear metrics for delivery.

Maximise the digital clusters collaboration across the UK by adopting an industry-led group with a core mission to `Grow the North's digital economy' collectively formed by LEPs, academia and businesses.

Engage in creating new partnerships between higher education institutions for support in the adoption of R&D and innovation.

Engage in collaboration across regions to share best practices on digital programmes/initiatives targeted at supporting the digital economy.

Recommendations

4. Address the barriers to innovation and growth within the digital economy of the North

Action for: Government, NP11 & Partners

This report identifies barriers that the North needs to overcome to support the North Star. Infrastructure, Innovation and Education are three key enablers that if addressed through a pan-northern lens, will provide huge support to meet the collective objective of the digital economy.

4.1 Infrastructure

Continue to provide continuous support for the digital infrastructure in the North and the nation through pushing full-fibre broadband to every premises by 2030 with a particular focus on committing to addressing the poor infrastructure connecting rural areas across the North.

Support the investment into 5G Testbeds to ensure pilots are rolled out and scaled across a wider geography for the benefit of residents and businesses who rely on this technology.

4.2 Innovation

Improve access to finance for innovation and R&D for companies within the North and increase the international visibility of the North's Digital Clusters and drive Foreign Direct Investment (FDI) in the North by better coordination of the existing and future innovation pipeline infrastructure.

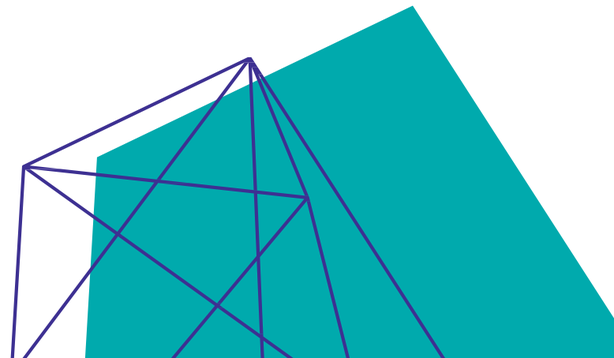
Provide pan-Northern support for innovative SMEs operating within the digital economy of the North through a Northern digital incubator to help digital companies grow and traditional businesses to innovate promoting community, technology incubation and corporate innovation.

Align with existing targets and new initiatives from the NP11 Innovation Leads group to support where digital and innovation overlap.

4.3 Education

Invest in the people, skills, and talent to address the digital skills gap present across the North and the nation through a Digital Skills Plan that addresses both national and regional needs. So that by 2030, every child will be digitally literate when they leave full-time education.

Encourage a pan-northern Digital Skills Partnership to train the young and unemployed in both digital upskilling and advocate for investment in digital skills and core literacy of young people for the education system to solidify the future of the North's and nations talent pipeline.



Recommendations

5. Address the wider national requirements for digital businesses to flourish

Action for: Government

To achieve the full potential of the digital economy, wider nationally relevant policy requirements will be necessary to support the fast-growing sector. The NP11 should continue to contribute to and inform the development of policies in these areas:

Redefine the terms of the digital economy to ensure they are expansive enough to cope with future innovation, adaptation, and change.

Revise the SIC code system to allow for a consistent view of the digital economy across the UK. This should be used to measure and track progress against ambition. The collection of primary research exemplified how each region struggled with the categorisation of the digital economy and the SIC code system.

Take steps towards devolution deals for more parts of the North to allow for the transfer of powers and funding from national to local government.

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