MIDLANDS ENGINE
Observatory

MIDLANDS ENGINE
DIGITAL DEEP DIVE

December 2021

Executive Summary

The rapid extension of **efficient and accessible digital technology has revolutionised nearly every aspect of our lives**. For citizens and businesses alike, there has been a dramatic shift in the everyday potential of digital. Not only has it developed the capacity of ordinary businesses, it has also **opened a new market of opportunity**. This became clear when the Covid-19 pandemic led to a rapid and mass digitisation at an unprecedented scale. **Digital is recognised as a critical enabler across all workstreams of the Midlands Engine partnership**, reflecting it's role as a key factor in the future success of the regional economy. Our facilitative role is driven by Midlands Engine Digital which has an influence across Midlands Engine work. This "digital deep dive" has been produced by Midlands Engine Observatory, and focuses on the underpinning evidence of digital capabilities and infrastructure in the Midlands. Reflecting our evidence-led approach, it presents data and other insight about digital as both an economic sector and a key cross-cutting part of the economy and our lives. **The deep dive is intended to support decision-making and drive momentum on the digital policy area, building on existing work across the region and catalysing further collaboration within different sectors of the Midlands Engine economy.**

Sectoral Impact

- Over **280,000 people** are employed directly in the Digital sector across the Midlands Engine (6% of total employment) across **20,000 enterprise**s (5.3% of total) generating **£10.6bn of GVA** (4.3% of total).
- **Vibrant tech communities** have been established over the last ten years.
- Barriers to digital growth include **access to talent, weak levels of digital spinouts and a low density of high tech digital firms**. Reflecting this, TechUk's work on the **Digital Capital Index ranks the East Midlands 10th and West Midlands 5th** (out of 12 regions).
- **The Information and Communication sector (ICS) exported £2.9bn of ICS services (11.4% total service exports) and imported £0.8bn .**
- In 2019 there was a **net disinvestment of FDI inwards** flow into the ICS sector by -£283m.
- The region has received **£108m in funding from Innovate UK** across 353 digitally-related projects since 2016/17.

Labour Market and Digital Skills & the Digital Divide

- Since the start of 2021 there have been **769,656 total job postings for digital roles** of which 120,319 were unique. Job postings have **increased by 82%** since January.
- Reflecting the heightened demand for digital roles, **advertised salaries are 6.8% higher than in March 2020** and 14.6% higher than the long-run average. The **top 10 job titles identified account for just 14%** of all digital job postings. This low concentration reflects the **varied and cross-sectorial nature** of digital jobs. Total demand is highest for '**Programmers and Software Development Professionals'.**
- The **digital divide** is real and provides important disadvantages to people who are unable to access or use digital tools and services effectively.
- Both the East and West Midlands have the **3rd highest levels of people with very low digital engagement**, at 30%, compared to the UK average of 29%.

Connectivity and Infrastructure

- **Spatial differences within digital connectivity** exist across the vast Midlands region. This reflects inequalities in the quality of broadband / internet and therefore standard of digital access is very much depends on where you live, with a broad rural / urban divide widening the difference. There are **large rural areas where the 4G coverage is poor; 12.7% of the area, accounting for approximately 280k people**. Poor mobile phone coverage is issue for some rural areas such as the Marches and Greater Lincolnshire.
- Though there is now a very high coverage of superfast broadband (96%) and 97.9% of premises in the Midlands had Next Generation Access (NGA) broadband; above the UK-wide proportion of 97.5% of premises **digital connectivity is still a problem** in some parts of the region. The **East Midlands is currently in the lowest quartile for full fibre and gigabit-capable coverage**. Digital connectivity is highly variable in **rural places** such as the Marches and rural parts of Leicestershire and Staffordshire which will limit the ability of staff to work from home and the productivity of home-based businesses, and hinders modern communications with clients/suppliers overseas.
- **19.3% had full fibre availability for broadban**d, with only 1.5% availability for both North East Lincolnshire and Oadby & Wigston lower and many locations at postcode level had less than 10% full fibre capability
- **36.4% have gigabit** availability for broadband. However this is highly variable by spatial location with many locations at postcode level had less than 10% gigabit capability.
- A comprehensive full fibre broadband network in the Midlands could enable **155,000 new people to enter the region's workforce. 5G alone is worth £5 billion to the economy in the next 5 years.**

Business Environment

Digital Capital Index

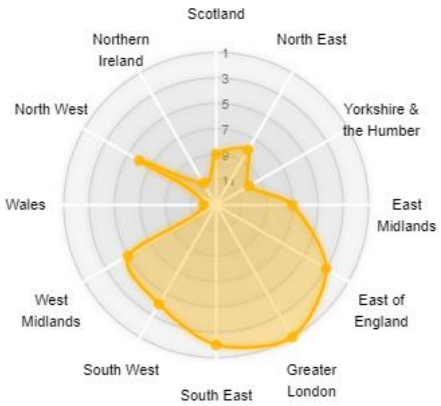
TechUK worked with the tech sector, local and national government and others stakeholders to develop the new Local Digital Capital (LDC) Index as a way to measure the **strength of local digital ecosystems** across the nations and regions of the UK. Local Digital Capital describes the building blocks of strong place-based digital technology ecosystems. It does not just focus on the tech sector itself but looks outwards to **assess the impact that technology is having in a locality.**

The 2021 Index measures six out of the seven components of Local Digital Capital. The data shows that the **East Midlands is ranked 10th out of 12 regions, and the West Midlands is ranked 5th.**

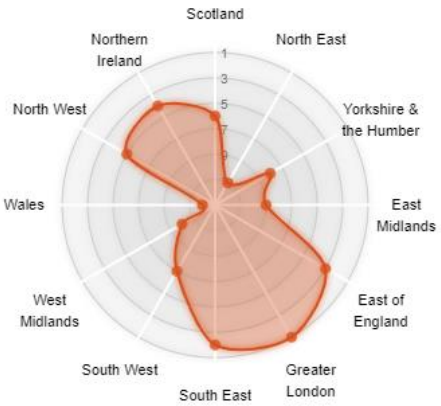
The research has shown that there is no debate about the **need to develop the tech sector across the UK.** If we want to compete, thrive and drive forward innovation and collaboration then we must invest in digital as a route to level-up and develop jobs, businesses and economic growth beyond London and the South East.

Overall Rank	Nation/Region	Skills Rank	Adoption Rank	Infrastructure Rank	R&D Rank	F&I Rank	Trade Rank
1	Greater London	1	1	1	11	1	7
2	East of England	3	3	9	1	4	5
3	South East	2	2	6	2	5	2
4	Northern Ireland	11	4	8	8	2	1
5	West Midlands	5	10	2	3	7	3
6	South West	4	7	11	9	3	6
7	North West	6	5	3	7	6	10
8	North East	8	11	7	4	8	9
9	Scotland	9	6	10	5	10	8
10	East Midlands	7	9	5	6	12	4
11	Yorkshire & The Humber	10	8	4	10	11	11
12	Wales	12	12	12	12	9	12

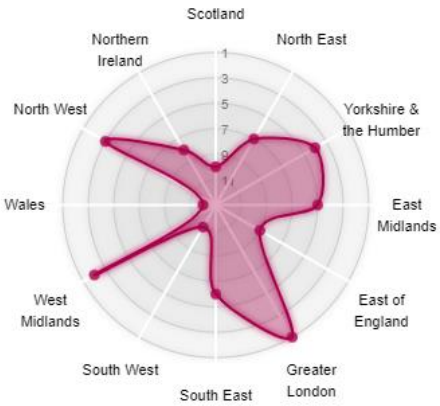
Skills



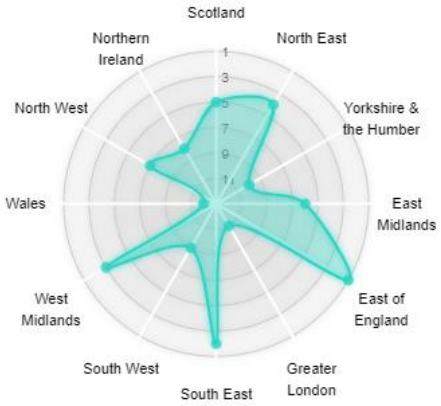
Digital Adoption



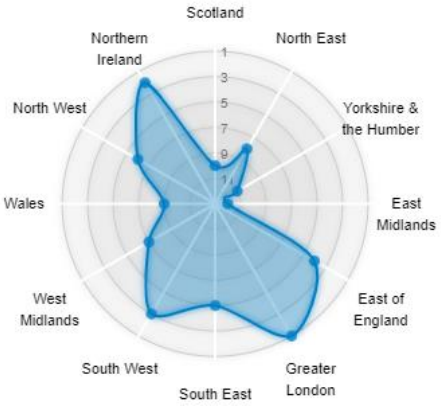
Digital Infrastructure



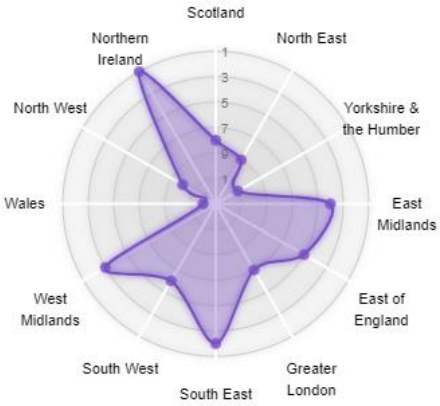
Research & Development



Finance & Investment



Trade



Source: TechUK, 2021

Tech Nation – East Midlands

East Midlands

Tech sector performance [1]

11,225
Number of digital tech firms

6%
Digital % of firms

55,520
Employment

2%
Digital employment

£9bn
Turnover

3%
Digital % of turnover

1
Unicorns

0
Future unicorns

Tech hubs [2]

City	2020 investment	UK rank
Nottingham	£46m	9
Lincoln	£2m	26
Leicester	£1m	29

Sources:
[1] Tech Nation, Office for National Statistics, 2019 [2] Tech Nation, Dealroom, 2021

Diversity [1]

Female

16.1% % of digital jobs (tech sector)	**23.0%** % of digital jobs (non-tech sector)	**36.6%** % non-digital jol (tech sector)

BAME

18.9% % of digital jobs (tech sector)	**16.5%** % of digital jobs (non-tech sector)	**13.7%** % non-digital jobs (tech sector)

Under 35

44.7% % of digital jobs (tech sector)	**35.8%** % of digital jobs (non-tech sector)	**36.4%** % non-digital jobs (tech sector)

Public opinion [2]

Which industries do you think technology will have the greatest impact on?

Health - 41.1%; Research - 34.3%; Media - 34.3%

Which application have you relied upon the most during COVID-19?

other

Total VC investment [1]

Sector spotlights [2]

Createch

£17.9m Total invested 2020	**+94%** % change 2019-2020 investment
1 No. of deals	**£17.9m** Median investment value

Sources:
[1] Tech Nation, Dealroom, 2021 [2] Tech Nation, Pitchbook, 2021

Source: [The Future UK Tech Built, Tech Nation 2021]

Tech Nation – West Midlands

West Midlands

Tech sector performance [1]

14,030
Number of digital tech firms

6%
Digital % of firms

65,480
Employment

3%
Digital employment

£11bn
Turnover

3%
Digital % of turnover

2
Unicorns

2
Future unicorns

Tech hubs [2]

City	2020 investment	UK rank
Warwick	£7m	19
Birmingham	£6m	20
Worcester	£5m	21
Malvern	£3m	25

Sources:
[1] Tech Nation, Office for National Statistics, 2019 [2] Tech Nation, Dealroom, 2021

Diversity [1]

Female		
15.4% % of digital jobs (tech sector)	**18.0%** % of digital jobs (non-tech sector)	**40.5%** % non-digital jobs (tech sector)

BAME		
21.0% % of digital jobs (tech sector)	**17.3%** % of digital jobs (non-tech sector)	**12.6%** % non-digital jobs (tech sector)

Under 35		
40.7% % of digital jobs (tech sector)	**35.4%** % of digital jobs (non-tech sector)	**44.9%** % non-digital jobs (tech sector)

Public opinion [2]

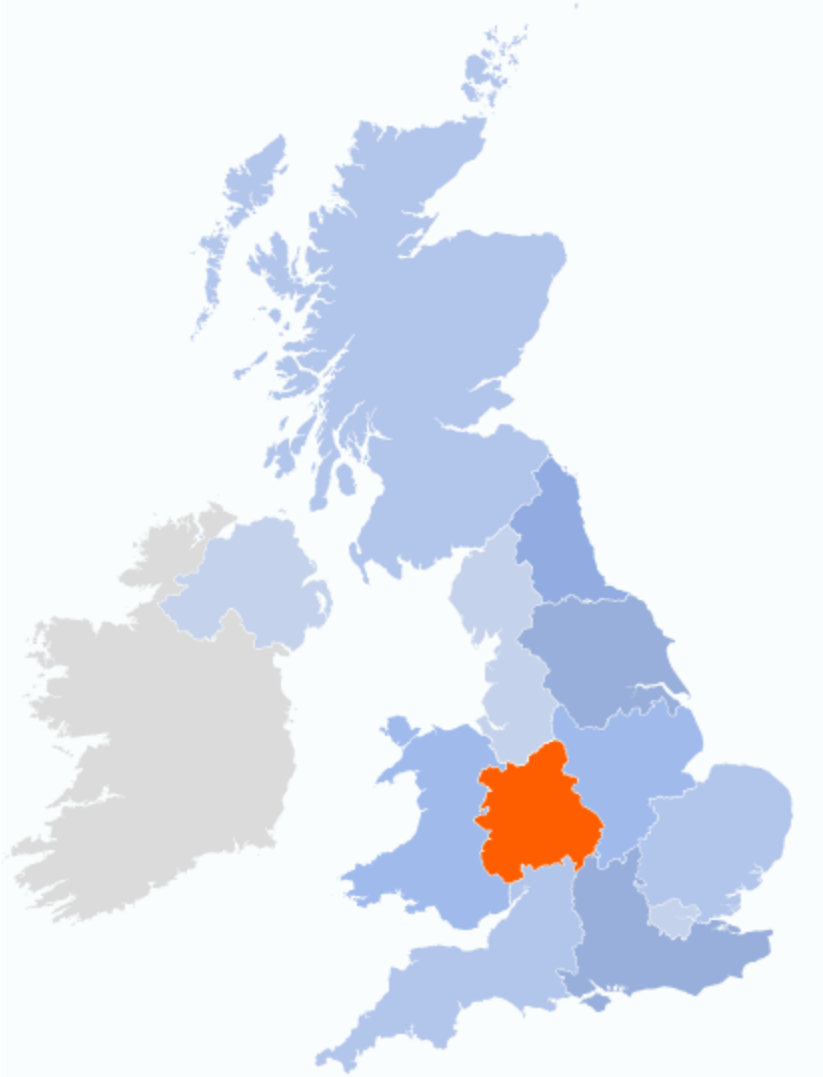
Which industries do you think technology will have the greatest impact on?

Health - 40.6%; Media - 39.1%

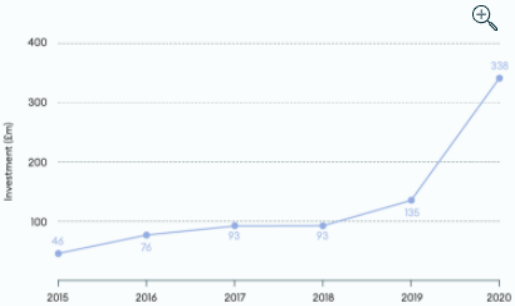
Which application have you relied upon the most during COVID-19?

other

Sources:
[1] Tech Nation, Office for National Statistics, 2019 [2] Tech Nation, Streetbees, 2021



Total VC investment [1]



Sector spotlights [2]

Climate tech	
£8.2m Total invested 2020	**+192%** % change 2019-2020 investment
9 No. of deals	**£0.5m** Median investment value

Sources:
[1] Tech Nation, Dealroom, 2021 [2] Tech Nation, Pitchbook, 2021

Source: [The Future UK Tech Built, Tech Nation 2021]

Midlands Engine Digital Sector - Strengths and Barriers to Growth in the Business Community

Strengths

- In recent years, the East Midlands has **grown above the median in terms of both digital sector employees (3.2% per annum) and digital sector GVA (5.7% per annum).**
- These regional averages do not do justice, however, to the two East Midlands cities in which the digital sector is particularly strong. **Nottingham features in the top quartile of UK NUTS3 areas for the digital sector share of employees (5.1%), recent growth in digital sector employees (5.7% per annum) and recent growth in digital sector GVA (8.7% per annum). Leicester is in the top quartile of NUTS3 areas for recent growth in digital sector employees (6.5% per annum) and recent growth in digital sector GVA (15.6% per annum).**
- In the West Midlands**, there has been strong growth in digital occupations (6.9% per annum between 2014 and 2019), with digital employment (sector and occupations) at 155k workers (5.6% of the overall regional workforce). GVA has grown by 7.6% per annum between 2014 and 2019,** which was been driven primarily by the 'Computer programming and consultancy' (10.6% per annum) sub-sector.
- **Survival rates** for digital sector businesses are relatively **high** in the East Midlands: 63% of such firms survive into their third year, which is in the top quartile of UK regions for this metric.
- Such growth has reflected the **region's success in recently attracting large employers** (e.g. IBM's Client Innovation Centre at Leicester), as well as the **development of substantial home-grown digital businesses** such as Experian, UNiDAYS (online student community), Lockwood Publishing (mobile games), and ENSEK (energy sector software).
- **Vibrant tech communities** have been established over the last ten years, particularly in Nottingham (Tech Nottingham) and Leicester (Create Leicester and Leicester Tech Startups). Tech Nottingham is the largest of these, and now has around 3,000 members. **By providing networking and collaboration opportunities these grassroots organisations have strengthened the connections within the East Midlands tech community, making it much easier to seek advice and support from peers.**
- There have been **clear successes in attracting and retaining large digital economy employers** – e.g. Codemasters at Leamington, and HSBC (UK headquarters), Goldman Sachs (Northern Office), Deutsche Bank and Lombard Risk (new Technology Centre), all in Birmingham.
- The region has a **well-regarded infrastructure for digital and associated tech incubators and workspaces**, including Innovation Birmingham (at Aston, and home to over 170 technology-facing companies) Birmingham's WeWork and STEAMhouse, Spark Wolverhampton, and Warwick Enterprises (on campus at Warwick University, and at Leamington Spa).
- There is a **well-coordinated promotional effort for the region's digital economy at home and abroad**, led by the West Midlands Growth Company and InvestWM.

Barriers to Growth

- **Access to talent is a pressing concern** and is a **critical constraint** on the growth of the region's digital ecosystem.
- The East Midlands currently has the **second lowest median gross annual pay in the digital sector of all UK regions** (£30.2k), and is in the lowest quartile for median gross annual pay of IT and telecoms professionals (£35.8k). This is **likely a contributory factor to the difficulties in attracting and retaining digital talent** and reflects the fact that the sector only accounts for a relatively modest – albeit growing – share of the region's economy (3.6% of GVA).
- **Three-year survival rates of digital sector firms are weak** in the West Midlands. The region's current performance (60.8%) is some 4.1 percentage points behind the best performing region.
- **Relatively little external capital is being invested in the region's digital sector** which presents a further barrier to maximising its growth potential. Normalised to the population size, the East Midlands has had the least venture capital funding into its digital sector of any UK region over recent years. In the period 2016 to 2020, funds raised by East Midlands digital companies amounted to just 0.2% of the UK total, according to Beauhurst data, compared to the region's UK population share of 7%.

Source: Department for Culture, Media & Sport, 2021

Midlands Engine Digital Sector - Opportunities to Achieve Prosperity the Business Community

Opportunities/Specialisms

- Amongst the East Midlands **99 digital sector companies identified as high growth**, prominent sub-sectors include **Software-as-a-Service** (31% of firms), **mobile apps** (24% of firms), **analytics, insight, tools** (15%) and **internet platform** (14%). The East Midlands has a diverse range of digital businesses. However, there are some **cluster specialisms**, for example in **Health Tech in Nottingham** (e.g. Imosphere, Pharmaseal, Boditrax), **Agri-Tech in Lincolnshire** (supported by the University of Lincoln's Institute for Agri-food Technology), and **Creative Tech in Leicester** (e.g. Anicca, Bulb Studios, Herdl).
- Amongst the West Midlands **174 digital sector companies identified as high growth**, prominent sub-sectors include Software-as-a-Service (34% of firms) and Mobile Apps (21% of firms).
- Whilst Birmingham continues as the main centre, **the digital economy is increasingly multi-centred** in its distribution, with **strong nodes of digital sector employment** around Leamington Spa (Gaming), Worcester, Warwick (linking with the subregion's expertise in Advanced Manufacturing), and Nuneaton, for example.
- Internationally, the West Midlands is promoting three **High Performing Opportunities (HPOs).** These are focused on **Birmingham and Solihull (Data Driven Healthcare and Technologies), Coventry and Warwickshire (Connected and autonomous vehicle modelling and simulation), and Leamington Silicon Spa (Gaming).**
- The region's public sector will become an increasingly important customer for, and component of, the region's digital sector. Existing public sector components of the digital economy include the **West Midlands Police Force** (national leaders in data-led policing and data ethics), and the **West Midland's Health Data Research Centre** (with its hub in central Birmingham and federated locations at Leicester, Nottingham, and Warwick).
- **The nexus of expertise in manufacturing and the digital economy offers the region the opportunity to become a major centre for digitally-enabled Advanced Manufacturing technologies and methods**. This will be tested by the region's Made Smarter Technology Adoption Pilot, which helps SME manufacturers introduce digital tools and technologies to boost productivity and growth in the face of Industry 4.0. There could be opportunities to scale-up such support to make substantial impacts on the region's productivity growth.
- With the COVID-19 lockdowns, the Midlands Engine has seen a number of digital professionals re-locating to the region from London, while still working remotely for London-based firms. **This presents an opportunity** to **integrate these highly skilled people into the Midlands Engine tech community**, enabling them to **share contacts and expertise**, and **create a wider base of experienced digital professionals** from which Midlands Engine tech businesses can recruit.

Achieving Prosperity

- On the basis of Steer-ED's indicative modelling, the digital sector in the East Midlands has **the potential to grow by at least £1.5 billion in annual GVA by 2025 (an increase of 38% on the 2019 value), creating an additional 36,500 jobs (an increase of 49% on the employment in 2019).**
- The West Midlands has the **potential to grow by at least £2.7 billion in annual GVA by 2025 (an increase of 41% on the 2019 value), creating an additional 52,700 jobs (an increase of 55% on the employment in 2019).**
- Recent growth in the region's digital economy has largely been down to the **software and data-intensive Computer Programming and Consultancy and Information Services segments**. These are vital bedrock sectors for the region, but going forward, work is needed to both consolidate the good progress made and accelerate growth.
- In realising the 'prosperity prize', **constraints on the availability of funding also need to be recognised**, especially around Angel and venture finance which are both necessary to lubricate the virtuous circle of start-up and scaling. **Availability of talent** is also an issue, in terms of both volume and experience. These constraints must be tackled if the full economic potential of the region's digital economy is to be realised.
- Whilst focusing on the above issues is key to enabling prosperity, the region can look already to the digital economies in Nottingham and Leicester to see what can be achieved in a relatively short space of time.

Source: Department for Culture, Media & Sport, 2021

Enterprises

Snapshot data shows there were approximately **380,560 enterprises in the Midlands Engine area in 2021**. Of this, approximately **20,015 (5.3%) were in the digital and creative sector.** Since the 2020 snapshot data, **enterprises in the digital and creative sector has declined by 3.8% (-795), although the decline was smaller than the UK average (-5.7%).**

In 2021, the legal status of all the digital and creative enterprises in the Midlands Engine were in the private sector, with 95.7% companies including building societies (UK 95.9%), 2.3% were sole proprietors (UK 3.1%), 0.2% were a partnership (UK 0.6%) and 0.1% were non-profit body or mutual association (UK 0.4%).

The Midlands Engine area had a higher proportion of enterprises with 0-4 employees when compared to the UK proportion (89.2% vs 88.9%) in 2021.

The following table shows the number and proportions of digital and creative enterprises broken down by employment size band, 2021:**

Employment Size band	Midlands Engine Number 2021	Midlands Engine Proportion 2021	UK Proportion 2021
Total	**20,015**		
Micro (0 to 9)	**18,860**	**94.2%**	**93.9%**
0 to 4	17,850	89.2%	88.9%
5 to 9	925	4.6%	5.0%
Small (10 to 49)	**860**	**4.3%**	**4.9%**
10 to 19	490	2.4%	3.0%
20 to 49	295	1.5%	1.9%
Medium-sized (50 to 249)	**145**	**0.7%**	**1.0%**
50 to 99	80	0.4%	0.7%
100 to 249	20	0.1%	0.3%
Large (250+)	**5**	**0.02%**	**0.2%**
250 to 499	0	0%	0.1%
500 to 999	0	0%	0.1%
1000+	0	0%	0%

Despite the fall in digital and creative enterprises since 2020, in the Midlands Engine, **the proportion of enterprises with 5-9 employees increased by 0.1 percentage point (pp), 20-49 employees increased by 0.2pp and overall medium sized (50-249) increased by 0.1pp.**

*DCMS use SIC 58-63 for the digital sector, in this report it is called the 'digital & creative' sector.
**Due to rounding figures may not sum.

The Midlands Engine had a higher proportion of digital and creative enterprises with turnover of £50,000 to £99,000 when compared to the UK proportion in 2021. **The turnover band with the highest proportion of digital and creative enterprises in 2021 was £100,000 to £199,000 with 38.3% (UK 39.9%).**

In the 2020 snapshot, in the Midlands Engine, the proportion of digital and creative enterprises with turnover of £200-£499k increased by 0.8pp which was slightly above the UK increase (+0.7pp).

The following table shows the number and proportions of digital and creative enterprises broken down by turnover band, 2021:**

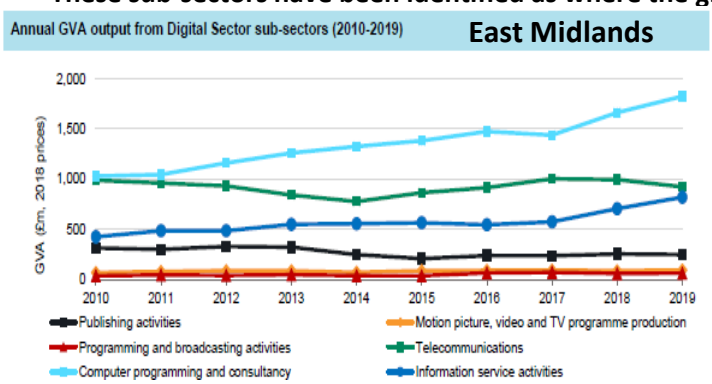
Turnover band (thousand)	Midlands Engine Number 2021	Midlands Engine Proportion 2021	UK Proportion 2021
Total	20,015		
£0 to £49	2,965	14.8%	15.0%
£50 to £99	6,050	30.2%	28.7%
£100 to £199	7,675	38.3%	39.9%
£200 to £499	1,185	5.9%	6.3%
£500 to £999	595	3.0%	3.7%
£1,000 to £1,999	350	1.7%	2.5%
£2,000 to £4,999	285	1.4%	2.0%
£5,000 to £9,999	65	0.3%	0.8%
£10,000 to £49,999	75	0.4%	0.8%
£50,000+	5	0.02%	0.3%

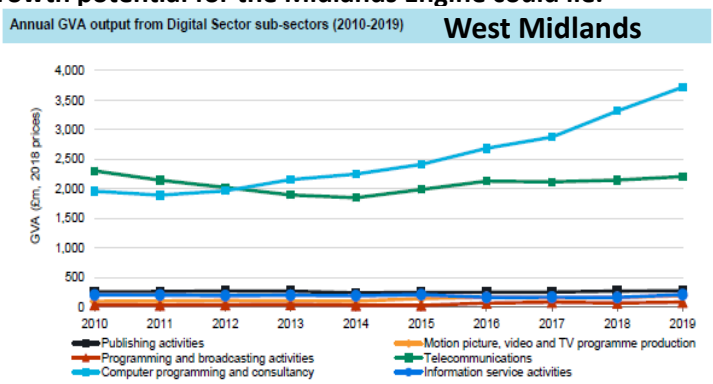
The UK Business; activity, size and location dataset released in October 2021 provides a snapshot of the Business Demography dataset from 12th March 2021..

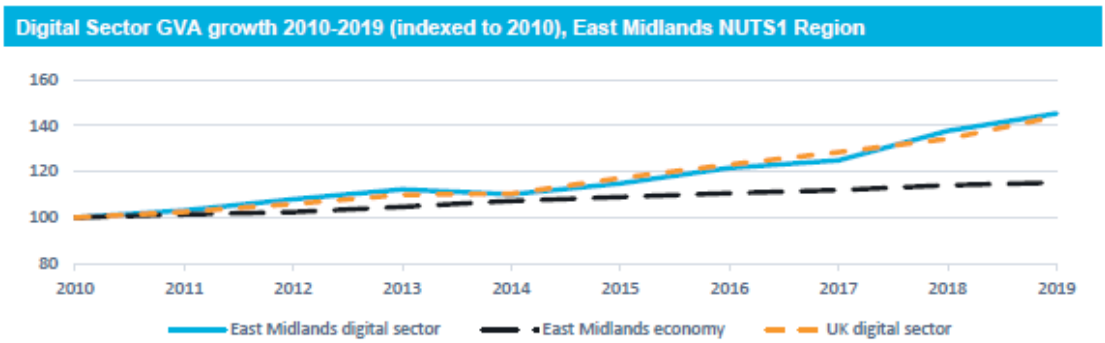
Assessing the UK's Regional Digital Ecosystems Midlands Engine Growth Potential

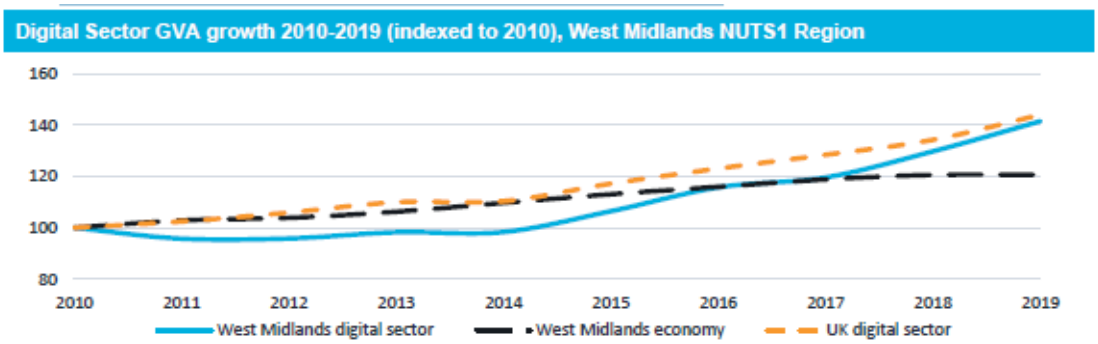
Growth Potential

- To understand the growth potential of the Midlands Engine a report by DCMS looked at what was driving growth. The **chart below plots the annual GVA output from six sub-sectors of the digital sector** from 2010-2019.
- The chart shows that there has been **significant growth in Computer programming and consultancy** (compound annual growth rate - CAGR of 6.6% in the East Midlands), and it is also **the largest sub-sector**. Information service activities have grown steadily since 2010, and since 2017, at a faster pace. The sector grew at a CAGR of 8.09% between 2014-2019 in the East Midlands. **Telecommunications is the second largest sub-sector in the West Midlands, but hasn't experienced growth in the last decade.**
- **These sub-sectors have been identified as where the growth potential for the Midlands Engine could lie.**









High Growth businesses and specialisms

- Activities of high growth digital sector businesses help to identify in more detail the specific market areas in which the Midlands Engine has potential for further economic growth. There were **287 high growth businesses** in the Midlands Engine digital sector in 2021.
- **There were 99 high growth businesses in the digital sector in the East Midlands as at 2021, equating to 0.9% of the total number of digital sector businesses in the NUTS1 region.**
- **There were 188 high growth businesses in the digital sector in the West Midlands in 2021, equating to 1.3% of the total number of digital sector businesses in the NUTS1 region.**

Source: Department for Culture, Media & Sport, 2021

Foreign Direct Investment & International Trade

Foreign Direct Investment (FDI)

The FDI international **investment position** in the Midlands in 2019 was **£122.4bn,** of which 12.1% was in the Information and Communication Sector (£14.8bn). Since 2018, FDI international inward investment positions in the Midlands for information and communication increased by 12.0% (+£1.6bn) while the UK decreased by 27.5%. When compared to 2015, **there has been an increase in FDI international inward investment positions in the Midlands for information and communication by 70.5% (+£6.1bn) above the UK growth of 58.7%.**

In 2019, the overall Foreign Direct Investment (FDI) inward flow in the Midlands by **foreign companies** was nearly **£2.4bn.** There was a **net disinvestment of FDI inwards flow into the Midlands in information and communication by -£283m** which followed the national trend of -£2.6bn in 2019. This was a decrease of 120.2% for the Midlands and a decrease of 105.9% for the UK when compared to 2018. In 2019, there was a net disinvestment of £246m in the West Midlands and a net disinvestment of £37m for the East Midlands. This was a significant change since 2018 where figures were positive at £408m for the West Midlands and £996m for the East Midlands.

The following table shows FDI flows, FDI international positions and earnings from FDI in Information and Communication in the Midlands between 2015 to 2019 (figures in millions):

	2015	2016	2017	2018	2019	% of total FDI
FDI Flows	£235	£142	£1,249	£1,404	-£283	
FDI International investment positions	£8,699	£9,452	£12,006	£13,242	£14,828	12.1%
Earnings from FDI	-	-	-	£275	-	

- Indicates figures are unavailable.

International Trade

In 2018, overall there was £19.4bn of services imported and £25.8bn of services exported, leading to a trade surplus of £6.4bn for the Midlands. Within service industries there was **£0.8bn of imports (4.3% of total imports) and £2.9bn of exports (11.4% of total exports) in information and communication for the Midlands**. This means there was a **trade surplus of £2.1bn for information and communication industry**. The Midlands accounted for 3.5% of the UK imports in Information and communication and 6.0% of UK exports in information and communication in 2018.

When compared to 2017, the value of **information and communication imports has decreased from £0.9bn and the value of exports has increased from £1.9bn in the Midlands.**

In 2018, the West Midlands imported £0.5bn and exported £2.4bn in information and communication, this led to a **trade surplus of £1.9bn.** The East Midlands imported £0.3bn and exported £0.5bn in information and communication leading to a **trade surplus of £0.2bn.**

54.7% (£0.5bn) of information and communication imports into the Midlands were from the EU (UK 44.6%), while 74.7% (£2.2bn) of information and communication exports were sent outside the EU in 2018 (UK 60.4%). The Midlands had a trade surplus of £0.3bn with the EU and a trade surplus of £1.8bn with the rest of the world.

The following tables shows the total value of trade in information and communication services for the Midlands in 2018 (figures in millions):

	EU	Rest of world	Total	% of total
Imports	£460	£381	£841	4.3%
Exports	£744	£2,198	£2,944	11.4%
Balance	£284	£1,817	£2,101	33.0%

Source: ONS, Foreign direct investment involving UK companies by UK Country and region, (directional) : inward , released 2021. A net international investment position measures the gap between a nation's stock of foreign assets and a foreigner's stock of that nation's assets. Essentially, it can be viewed as a nation's balance sheet with the rest of the world at a specific point in time.
Source: ONS, International trade in services by subnational areas of the UK:2018, released 2020

Research and Development

Analysing Innovate UK awards that pertain to digital and creative since 2004 show that:

- Based on the Midlands Engine 9 LEP area, there has been **353 digital related** projects (out of 2,754 overall projects) funded through Innovate UK since 2016/17.
- For the 353 digital related projects, Innovate UK has offered approximately **£108m in funding (total costs of just over £158m)** across the Midlands Engine.
- 107 of projects are in the Coventry and Warwickshire LEP totalling nearly £42m in funding (total costs of just over £54m).

Among the projects with the most funding awarded were:

- Trusted Intelligent CAV (TIC-IT) – Horiba Mira and Coventry University; **£16m**
- UK Central CAV Testbed (Midlands Future Mobility) – West Midlands Combined Authority and University of Warwick; **£9m**
- PathLEAD: Pathology image data Lake for Education, Analytics and Discovery – University of Nottingham, University of Warwick and University Hospitals Coventry & Warwickshire NHS Trust; **£7m**
- Immersive performances of the future – Royal Shakespeare Company; **£2m**
- Robot Highways – Saga Robotics Limited; **£1m**

The Innovate UK awards reflect the enabling nature of digital and creative technologies and processes which are cross-cutting over a variety of different sectors in the Midlands. These range from the cultural sector, to transport and manufacturing amongst others.

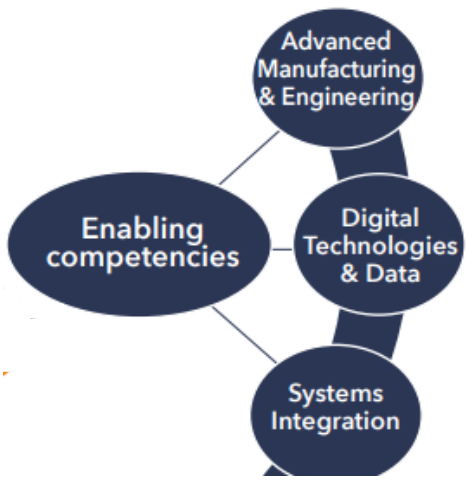
Midlands Engine Observatory have looked into the impact of digital on manufacturing in particular through the Manufacturing Opportunities report. This finds that **digital technologies have the potential to change the way manufacturing occurs through sensors and automation**. From satellites in farming to automated production, digital will create greater efficiencies, increased monitoring and reduced energy use. **The use of digital will also connect companies, increasing supply chain resilience.** Digital is a key theme within the report, highlighting key opportunities across the research's five clusters – most notably in transport, health, and energy systems. This supports the opportunities highlighted in the Midlands Engine Science and Innovation Audit:

Digital

- ***Automated production*** using drones and robotics will ***decrease waste*** and potentially make manufacturing across all sectors ***more efficient***
- ***Sensors*** can be used across ***food and health*** care to monitor patient health, increase food safety and reduce waste and improve crop yields
- Digital will change medicine, particularly ***monitoring and diagnostics***, through the use of ***wearable health devices and Big Data analysis***
- ***Digital control systems*** for the national grid and other systems like HS2 will be deployed across wind systems, among others, to ***understand usage and reduce waste***

The Midlands' R&D excellence – driven by universities and research centres – will be critical in ensuring we maintain our position at the forefront of new digital technologies and markets, applicable to a multiplicity of sectors. **Key assets in this space are identified, including:**

- Hereford Centre for Cyber Security
- Horiba Mira: Mira Technology Park, MIRA Technology Institute
- Institute for Digital Health, University of Warwick
- Manufacturing Technology Centre
- Warwick Manufacturing Group
- Midlands Cyber, Malvern (Worcestershire)
- Wolverhampton Cyber Research Institute
- Advanced Manufacturing Building, University of Nottingham
- East Midlands Centre of Excellence in Satellite Applications (Leicester)
- Intelligent Energy, Loughborough University



Source: UKRI

Research and Development

Creating the **right ecosystem for digital R&D to flourish** is explored by Barclays Eagle Labs and Beauhurst in their report "Creating Tech Ecosystems to Stimulate Local Economies." It is their belief that **healthy and vibrant localised technology ecosystems** have a critical role to play **in creating an environment that is conducive for start-ups businesses to flourish and grow**.

To succeed in developing such an ecosystem, all the key players need make a commitment to work together to springboard the growth of businesses in their region. The report identifies that **businesses located in areas where the local authority plays an active role to drive economic growth tend to thrive.** Examples from Edinburgh and Manchester are provided in the report, with wider recommendations including:

- Local authorities and government agencies should make **full use of available Government funding** and provide **education, facilities and direction** to local businesses and business groups about the available support and funding for tech businesses.
- Central government should consider **mobilising additional funding and support for regional bodies** such as the Midlands Engine and Northern Powerhouse, which is ringfenced for local authorities to tap into and empower them to build more thriving local economies throughout the country.
- Local authorities should seek support from organisations, like Barclays Eagle Labs, who have a strong track record in building tech ecosystems.

At the Midlands Engine level, the Discontinuous Innovation in the Midlands Engine (DIME) project scopes out the potential future of the Midlands in terms of digital innovation across a range of industry sectors. The study concludes that **the Midlands Engine has the potential** to make decisions that **set its strategy apart** from other regions and which **cultivate an internationally-leading digital identity**. In doing so, it will be important to explore:

- The role of "**superstar companies**" and their investment in the region.
- The **integration of key technological developments** including XR, Digital Twins, RegTech, Haptic Technology and Artificial Intelligence. Developing projects and capabilities in these technologies might have **significant multiplier effects** across the regional economy.
- How "Web 3.0" – a vision of the future of the Internet in which people operate on decentralised, quasi-anonymous platforms – can be a realistic proposition for the region, **maximising the use of blockchain technologies, cryptocurrencies and smart contracts.**

Research by Beauhurst with the Midlands Innovation Commercialisation of Research Accelerator (MICRA) looking at high growth firms and spinouts **already suggests a shift to digital in the high value economy**. Software-as-a-service (SaaS) is the sector with the most high-growth companies, while analytics and research is high for spin-outs.

TOP SECTORS BY HIGH-GROWTH COMPANY POPULATION

Sector	Midlands high-growth company population
Software-as-a-service (SaaS)	227
Food and drink processors (inc. quality control)	221
Automotive	201
Property/land development and construction	199
Distribution	177
E-commerce	158
Analytics, insight, tools	158
Mobile apps	151

TOP SECTORS BY SPINOUT COMPANY POPULATION

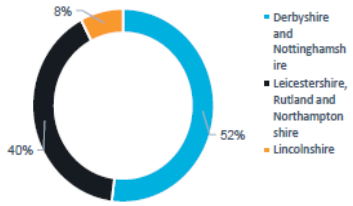
Sector	Midlands high-growth company population
Analytics, insight, tools	15
Research tools/reagents	15
Software-as-a-service (SaaS)	13
Pharmaceuticals	12
Medical devices	10
Materials technology	8
Clinical diagnostics	8
Machinery	5
Nanotechnology	5

Labour Market and Digital Skills

Assessing the UK's Regional Digital Ecosystems - Midlands Engine Digital Employment

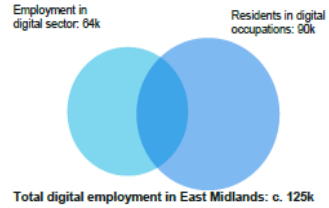
- Total digital employment (estimated at 280k in 2019) **is weighted towards digital occupations in businesses not traditionally in the Digital Sector**; this is **indicative of the high demand for digital skills in non-digital sector industries**, such as Transport and Storage (which link to the East Midlands region's transport infrastructure), as well as Finance, Retail, Energy, Recruitment, and Professional, Technical and Business Support Services (linked to the West Midlands business base).
- Demand for digital occupations in the East Midlands is dominated by both Derbyshire and Nottinghamshire (52%) and Leicestershire, Rutland and Northamptonshire (40%) of the area's digital occupation online job postings in 2019-2020, respectively. This is followed by Lincolnshire, which has a small proportion at 8%.
- Demand for digital occupations in the West Midlands region is **dominated by the West Midlands NUTS2 Region**, accounting for 51% of digital occupation online job postings in the 2019-2020 period.
- In the East Midlands there is relatively **high demand for Web Developers, Field Service Engineers and IT Support Analyst** (location quotient above 1.0, the UK average). The largest absolute demand for occupations is **Software Developers, accounting for 25% of digital occupation job adverts** in the 2019-2020 period, indicating increasing demand for innovative software and accelerating growth in technology.
- In the West Midlands there is relatively high demand for **Network Engineers, Field Service Engineers and IT Support Analysts** (location quotient above 1.0, the UK average) although the largest absolute demand for occupations (numbers of online job postings) are for Software Developers (19%), Data Engineers (9%), and Business Analysts (8%).

Demand for Digital Occupations by NUTS2 region in the East Midlands (2019 – 2020)



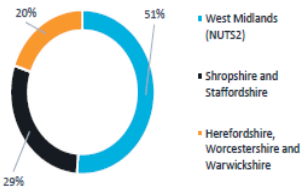
Source: Geek Talent, 2021

Digital Sector and Digital Occupation Employment (2019), East Midlands NUTS1 Region



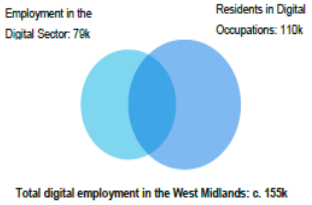
Source: Business Register and Employment Survey and Annual Population Survey, 2019

Demand for Digital Occupations by NUTS2 region in the West Midlands (2019 – 2020)



Source: Geek Talent, 2021

Digital Sector and Digital Occupation Employment (2019), West Midlands NUTS1 Region



Source: Business Register and Employment Survey and Annual Population Survey, 2019

The tables below shows digital occupations by demand for the East and West Midlands. It displays the total number of adverts, percentage share of digital occupation adverts, and the concentration of demand against the UK average.

Concentration of demand for Digital Occupations (2019-2020), East Midlands NUTS1 Region

Occupation	Total digital occupation adverts (2019-2020)	Share of total digital occupation adverts (%)	Location Quotient vs UK (1 = UK average)
Web Developer	7,097	6.4%	1.46
Field Service Engineer	3,157	2.8%	1.40
IT Support Analyst	7,952	7.1%	1.39
Software Developer	27,342	24.5%	1.22
IT Service Manager	2,425	2.2%	1.21
Database Administrator	1,710	1.5%	1.20
Test Analyst	3,341	3.0%	1.11
IT Manager	5,347	4.8%	1.09
System Administrator	1,573	1.4%	1.07
Business Development Executive	1,556	1.4%	0.98

Concentration of demand for Digital Occupations (2019-2020), West Midlands NUTS1 Region

Occupation	Total digital occupation adverts (2019-2020)	Share of total digital occupation adverts (%)	Location Quotient vs UK (1 = UK average)
Network Engineer	5,456	3.0%	1.41
Field Service Engineer	4,947	2.8%	1.36
IT Support Analyst	11,590	6.5%	1.26
IT Project Manager	8,378	4.7%	1.18
IT Service Manager	3,743	2.1%	1.16
Cyber Security Analyst	7,457	4.2%	1.14
Database Administrator	2,583	1.4%	1.13
Business Analyst	15,040	8.4%	1.12
IT Consultant	3,963	2.2%	1.10
Data Analyst	5,220	2.9%	1.07

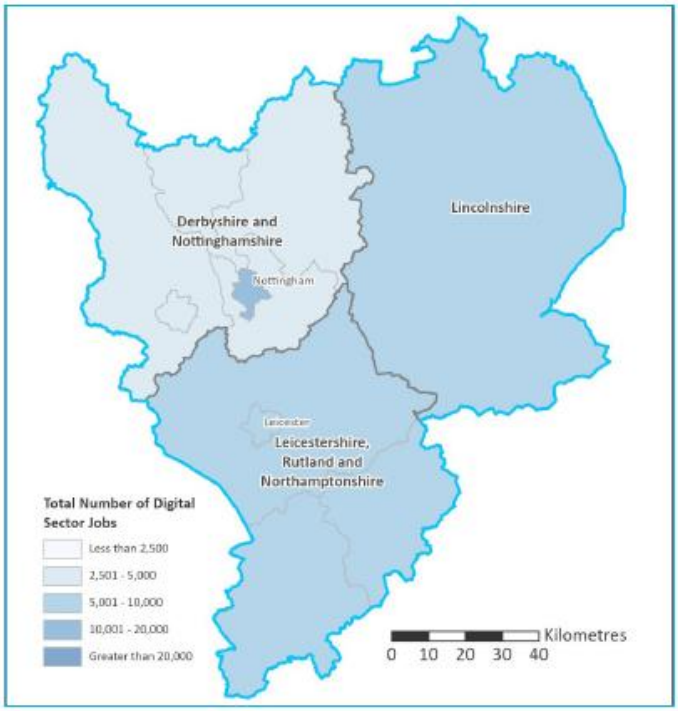
Source: Department for Culture, Media & Sport, 2021

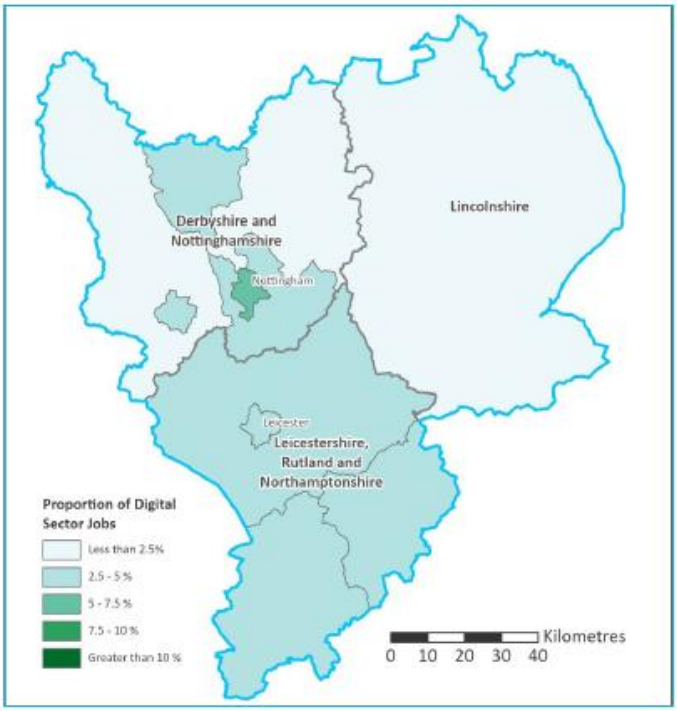
Digital Employment

The maps below show absolute digital employment and digital sector employment as a percentage of total employment by NUTS3 region. **They highlight where employment is concentrated and where there are relatively large employment clusters.**

East Midlands - Digital Sector's spatial distribution

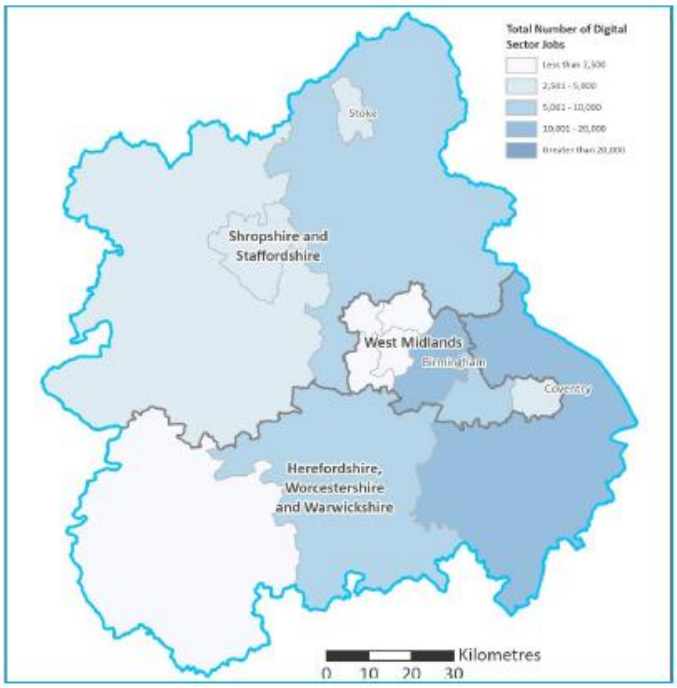
Digital Sector Employment Total and, as a percentage of Total Employment by NUTS3 (2019)

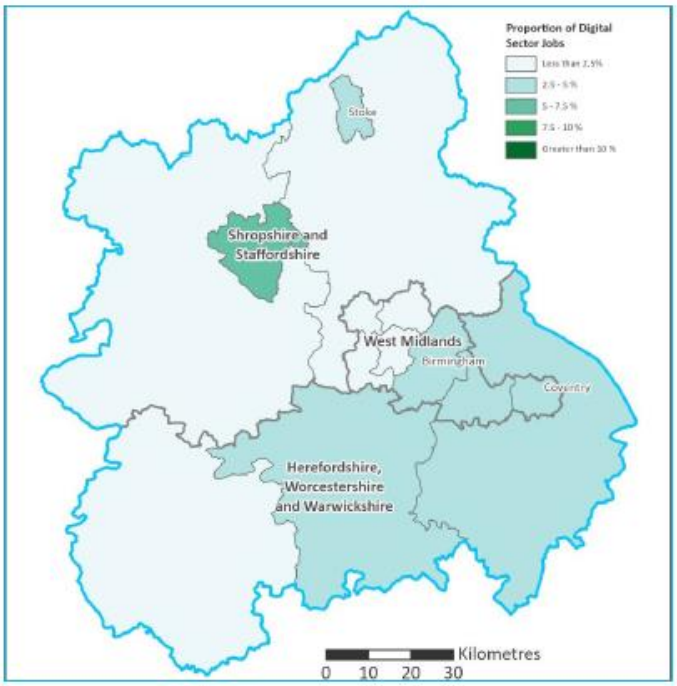




West Midlands - Digital Sector's spatial distribution

Digital Sector Employment Total and, as a percentage of Total Employment by NUTS3 (2019)



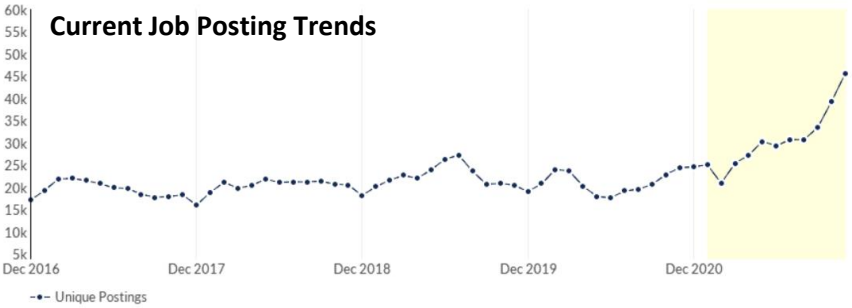


Source: Department for Culture, Media & Sport, 2021

Job Postings

Since the start of 2021, there have been **769,656 total job postings** for digital roles recorded across the Midlands Engine. Of these total postings, **120,319 were unique**, giving a **Posting Intensity of 6-to-1**, meaning that for every 6 postings there is 1 unique job posting.

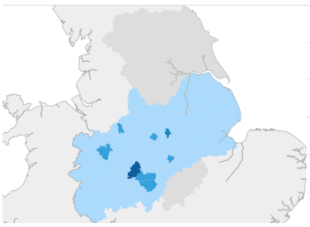
This is higher than the Posting Intensity for all other occupations (5-to-1) which indicates that recruiters are having to **work harder to fill vacant positions**.



Job postings have **increased by 82% since January**, as highlighted in yellow on the graph. Postings increased from an average of 6,262 a week in January to 11,399 in November.

Apart from a dip in February 2021, demand for digital roles have **increased month-on-month** since December 2020 and are now back above both pre-pandemic levels and the long-run average.

Top Posting Locations



Local Authority	Unique Postings (Jan 2021 - Nov 2021)
Birmingham	28,627
Nottingham	11,373
Leicester	5,558
Coventry	4,823
Warwick	4,610

These top 5 posting locations account for 46% of all unique digital job postings across the Midlands Engine. Birmingham is the most prevalent location and logs more than double the number of postings than Nottingham ranked second.

Posting Trends by Local Authority Areas

- Analysis by local authority (LA) shows **all 65 LA's recorded increased demand** ranging from 15% in Hinckley and Bosworth to 445% in South Staffordshire.
- By volume, **Birmingham logged by far the most digital job postings**. However, **posting intensity is highest in Telford and Wrekin, Redditch, Lichfield, Tamworth and South Kesteven – all 10:1.**

Wage Trends

Advertised Wage Trend

Reflecting the heightened demand for digital roles, **advertised salaries are 6.8% higher than in March 2020** and 14.6% higher than the long-run average. The average advertised salary for digital roles across the Midlands Engine is now £40,100.

Top Posted Titles

The top 10 job titles identified account for just 14% of all digital job postings. **This low concentration reflects the varied and cross-sectorial nature of digital jobs.**

'Electricians' is the singular most advertised position with 3,952 unique job postings. However, the posting intensity is lower than other roles, implying that recruiters believe that although in high demand there is some current capacity within the labour market.

Top Posted Titles

Job Title	Total/Unique (Jan 2021 - Nov 2021)	Posting Intensity	Median Posting Duration
Electricians	23,087 / 3,952	6 : 1	38 days
Electrical Maintenance Engineers	17,227 / 2,098	8 : 1	42 days
Software Developers	13,090 / 1,940	7 : 1	37 days
Software Engineers	11,060 / 1,653	7 : 1	33 days
.NET Developers	12,628 / 1,328	10 : 1	43 days
PHP Developers	11,670 / 1,297	9 : 1	41 days
DevOps Engineers	8,711 / 1,127	8 : 1	34 days
Web Developers	6,079 / 970	6 : 1	36 days
Maintenance Electricians	7,604 / 969	8 : 1	38 days
Full Stack Developers	6,820 / 927	7 : 1	36 days

Source: EMSI Analytics 2021 - Current Job Posting Trends (January to November 2021)

Job Postings

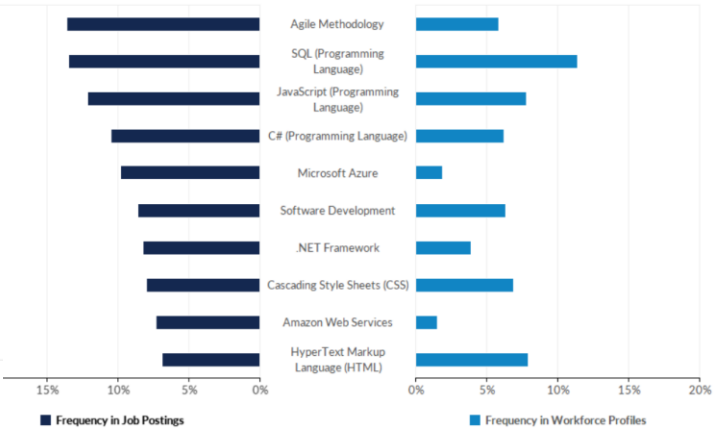
Concentration of Digital Occupations (Jan to Nov 2021)

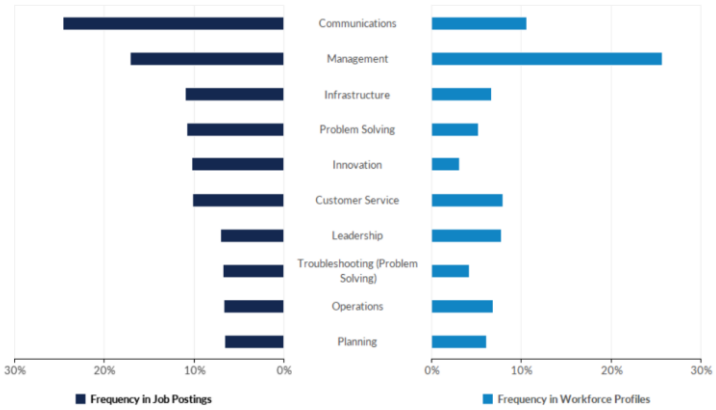
The table shows digital occupations by demand and the concentration of demand against the UK average (known as the **location quotient**). Total demand is highest for 'Programmers and Software Development Professionals'; whilst comparative demand is highest for 'Electricians and Electrical Fitters'.

SOC Description	Digital Job Postings Jan to Nov 2021	Share Total Digital Adverts (%)	Location Quotient (1 =UK Avg.)
Electricians and Electrical Fitters	46,265	13.7%	1.17
Electrical and Electronics Technicians	2,414	0.7%	1.12
IT User Support Technicians	24,381	7.2%	1.04
Telecommunications Engineers	5,288	1.6%	0.99
IT Business Analysts, Architects and Systems Designers	20,792	6.2%	0.87
IT Operations Technicians	28,631	8.5%	0.84
Web Design and Development Professionals	31,797	9.4%	0.83
IT Specialist Managers	39,678	11.8%	0.82
IT Project and Programme Managers	5,087	1.5%	0.73
Information Technology and Telecommunications Directors	347	0.1%	0.73
Programmers and Software Development Professionals	94,159	27.9%	0.72
Information Technology and Telecommunications Professionals n.e.c.	38,782	11.5%	0.69

Digital Hard Skills

The **biggest skills gaps for digital are two-fold**. **On one side, programming and the associated languages are required. Secondly the understanding of the actual infrastructure and computing platforms is in high demand.** Indeed, the two biggest gaps when comparing frequency in postings and current workforce profiles are for skills around Microsoft Azure and Amazon Web Services.



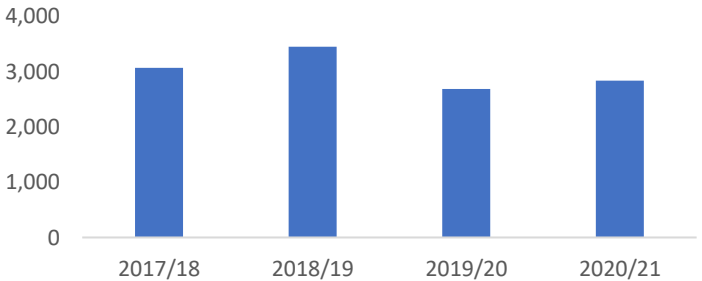


Top Common Skills

Most of the individual skills for which demand grew fastest in digital job postings were around **communication**, **infrastructure and problem solving.** Management and leadership skills were also in high-demand but there appears to be some capacity within current workforce profiles.

Apprenticeship Starts

Mirroring the national trend, apprenticeship starts were impacted due to COVID-19. The latest available data covering Q3 2020/21 shows there were 2,170 apprenticeship starts in Information and Communication, which accounted 4.3% of total apprenticeship starts.



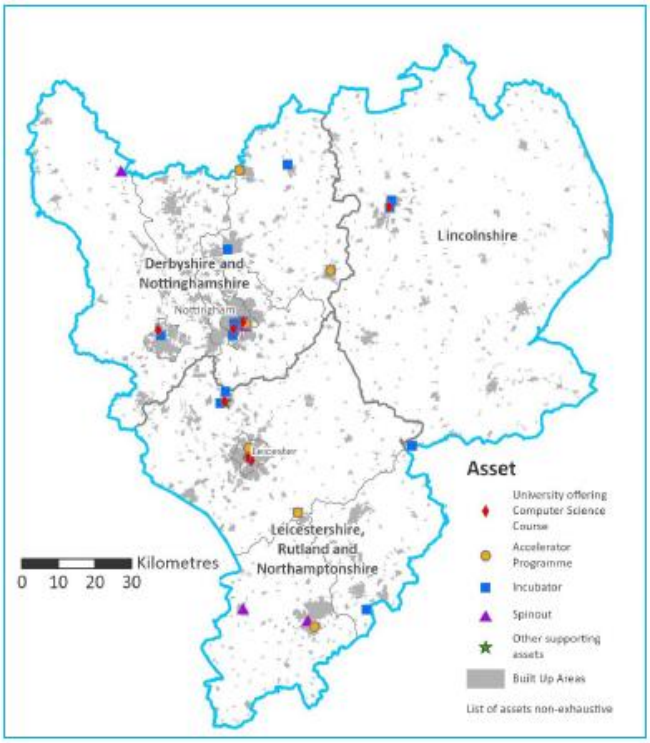
Source: EMSI Analytics 2021

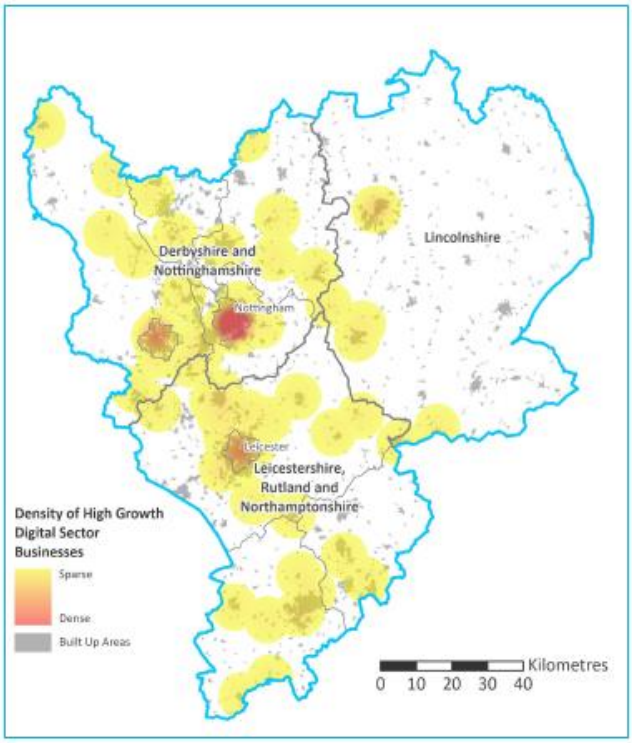
Connectivity and Infrastructure

Assessing the UK's Regional Digital Ecosystems - Midlands Engine Digital Assets

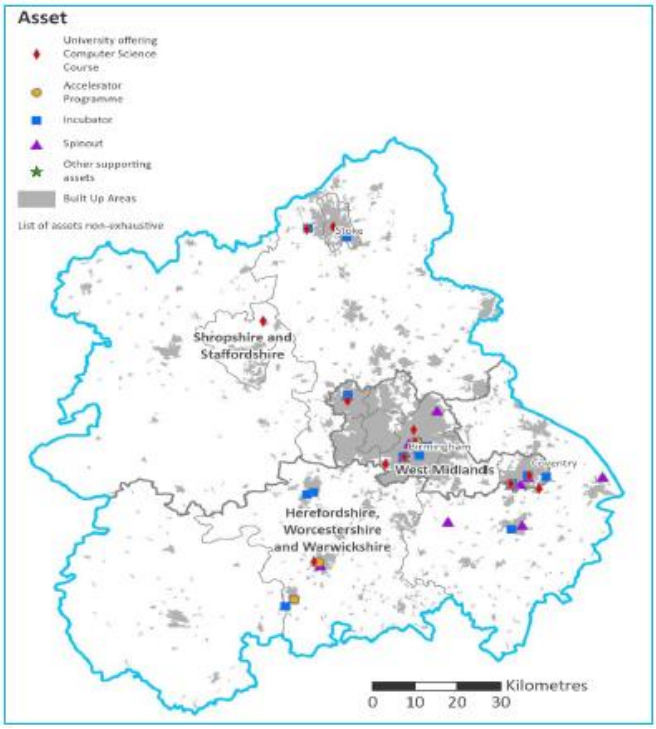
- The maps below on the left show the **location of digital ecosystem assets** in the Midlands Engine regions, including accelerators, incubators, universities with computer science courses, university spinouts, and additional research assets. It **highlights the concentration of assets in urban centres with universities.**
- The maps below to the right show the **density of high growth businesses operating in the digital sector** in the East and West Midlands. It **highlights how high growth businesses are concentrated in larger urban areas.**

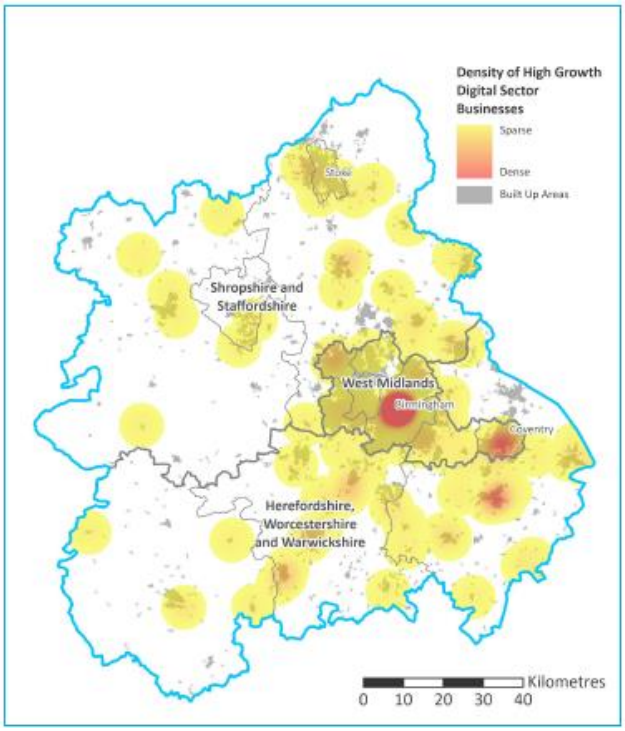
Digital Sector assets (2021), and density of digital sector high growth businesses (2020)





Digital Sector assets (2021), and density of digital sector high growth businesses (2020)



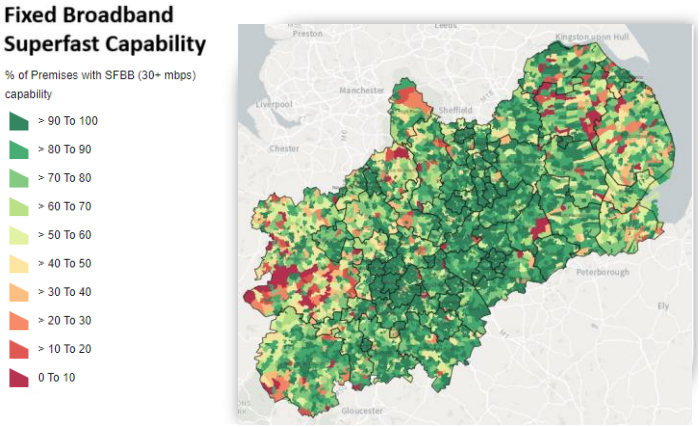


Source: Department for Culture, Media & Sport, 2021

Midlands Engine Digital Infrastructure

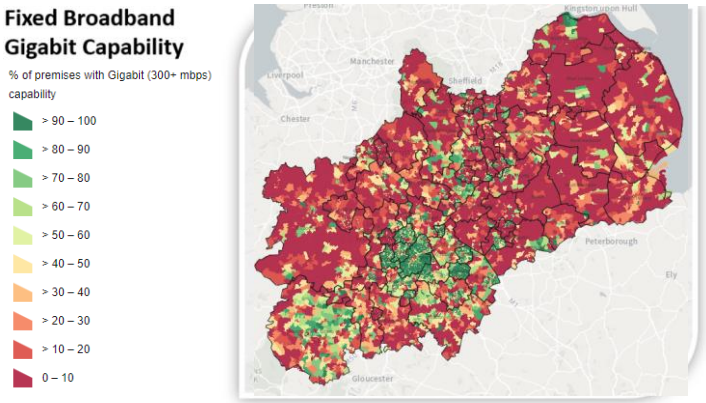
Infrastructure

- Data from Ofcom Connected Nation report, published in Summer 2021 (covering May 2021 period) shows that the **97.9% of premises in the Midlands had Next Generation Access (NGA) broadband**; above the UK-wide proportion of 97.5% of premises. Compared to May 2020, the percentage of premises in the Midlands with NGA broadband access decreased from 98.2%; the UK has remained at the same level.



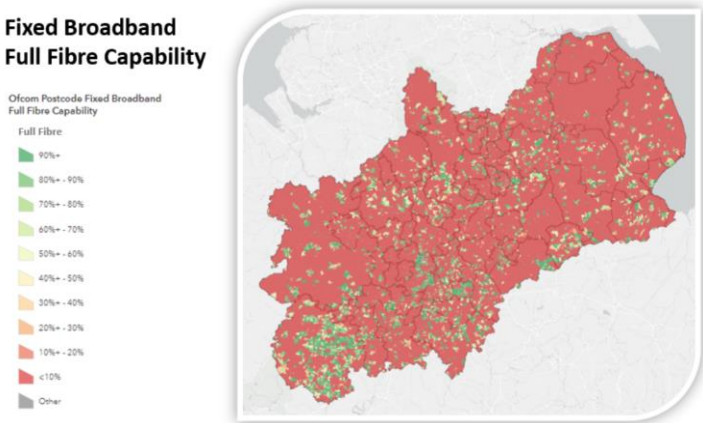
Fixed Broadband - Superfast Capability

Data from Ofcom shows that across all premises at local authority level for the Midlands, **95.6% had superfast availability for broadband.**
The map to the left looks at fixed broadband superfast capability down to postcode level which shows many areas had over 90% capability. However the map also identifies areas with less than 10% capability.



Fixed Broadband - Gigabit Capability

Across all premises at local authority level for the Midlands, **36.4% had gigabit availability for broadband**. When compared to the first map, this is significantly lower and many locations at postcode level had less than 10% gigabit capability.

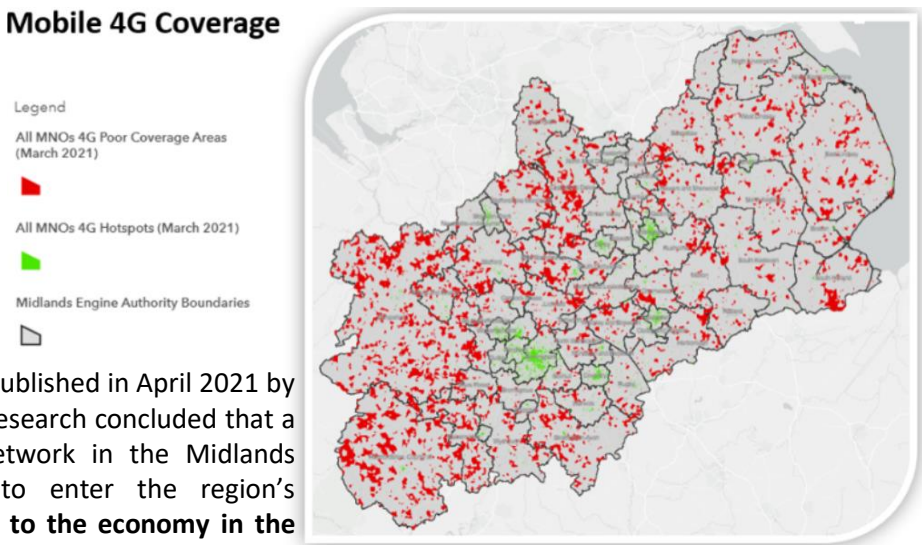


Fixed Broadband - Full Fibre Capability

Across all premises at local authority level for the Midlands, **19.3% had full fibre availability for broadband.** When compared to the first and second map, this is much lower and many locations at postcode level had less than 10% full fibre capability.

Mobile Broadband

Across the Midlands Engine there are large rural areas where the 4G coverage is poor; 12.7% of the area, accounting for approximately 280k people.



The Midlands Engine is **a centre of excellence in digital innovation,** is **leading in 5G** and is committed to delivering greater digital connectivity to drive the region's productivity. A report published in April 2021 by the Centre for Economics and Business Research concluded that a comprehensive full fibre broadband network in the Midlands could **enable 155,000 new people** to enter the region's workforce. **5G alone is worth £5 billion to the economy in the next 5 years**.

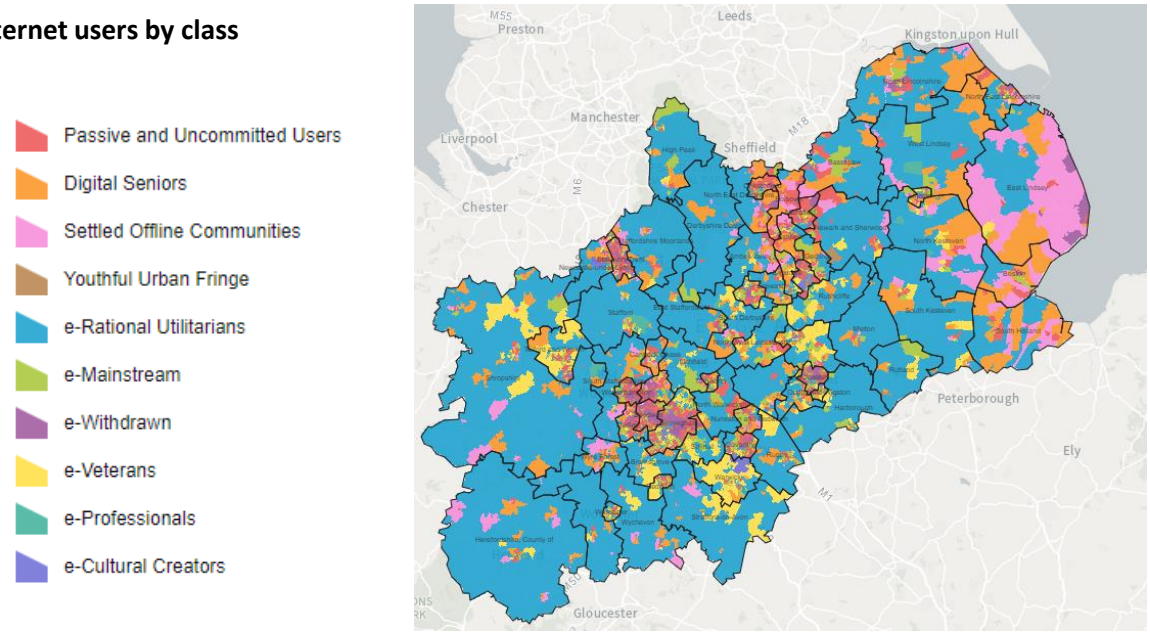
Source: WM5G

Source: Midlands Engine State of the Region, 2021

Source: Ofcom Connected Nations

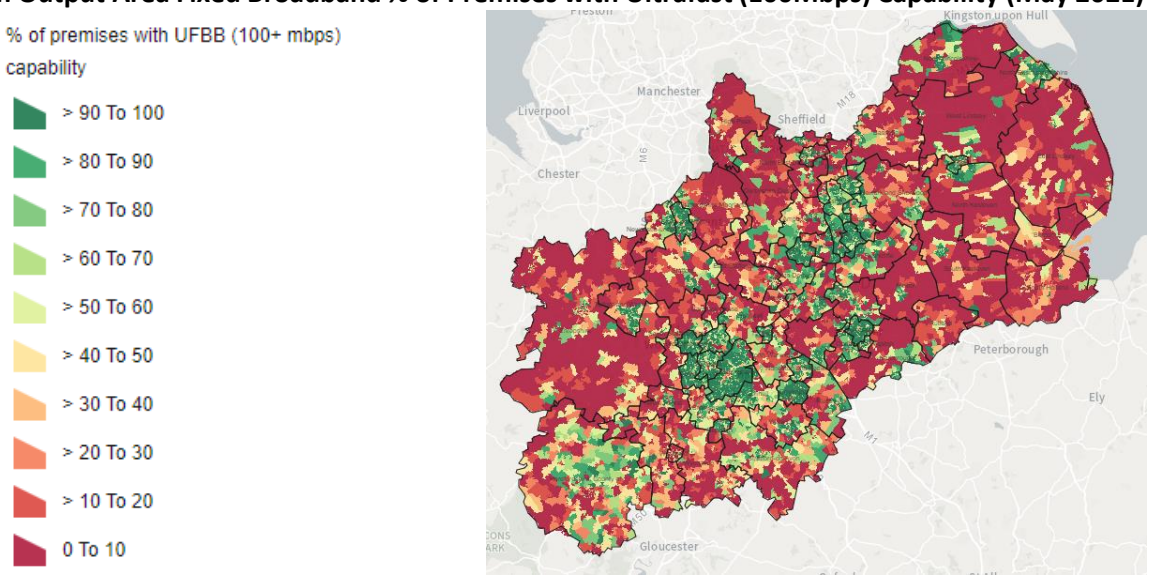
Connectivity

Internet users by class



Within the Midlands Engine, large parts of the area are classed as Passive and Uncommitted Users (26% of all LSOAs), followed by e-Rational Utilitarian's (17%). Settled Offline Communities (4%) are spread throughout the region but dominate East Lindsay and Boston. e-Withdrawn (13% of all LSOAs) dominate in urban centres.

Ofcom Output Area Fixed Broadband % of Premises with Ultrafast (100Mbps) Capability (May 2021)



93.0% of premises in Coventry have access to ultrafast broadband, compared to 4.8% in Boston. On average, 63.6% of premises across the Midlands Engine have access to this type of internet capacity.

Midlands Engine Infrastructure Strengths

- The West Midlands region has been selected to host the **UK's first multicity 5G testbed**.

Barriers to Growth

- Digital connectivity is also still a problem in some parts of the region. Though there is now a very high coverage of superfast broadband (96%), the East Midlands is currently in the lowest quartile for full fibre and gigabit-capable coverage.

Source: Department for Culture, Media & Sport, 2021

Digital Inclusion and Deprivation

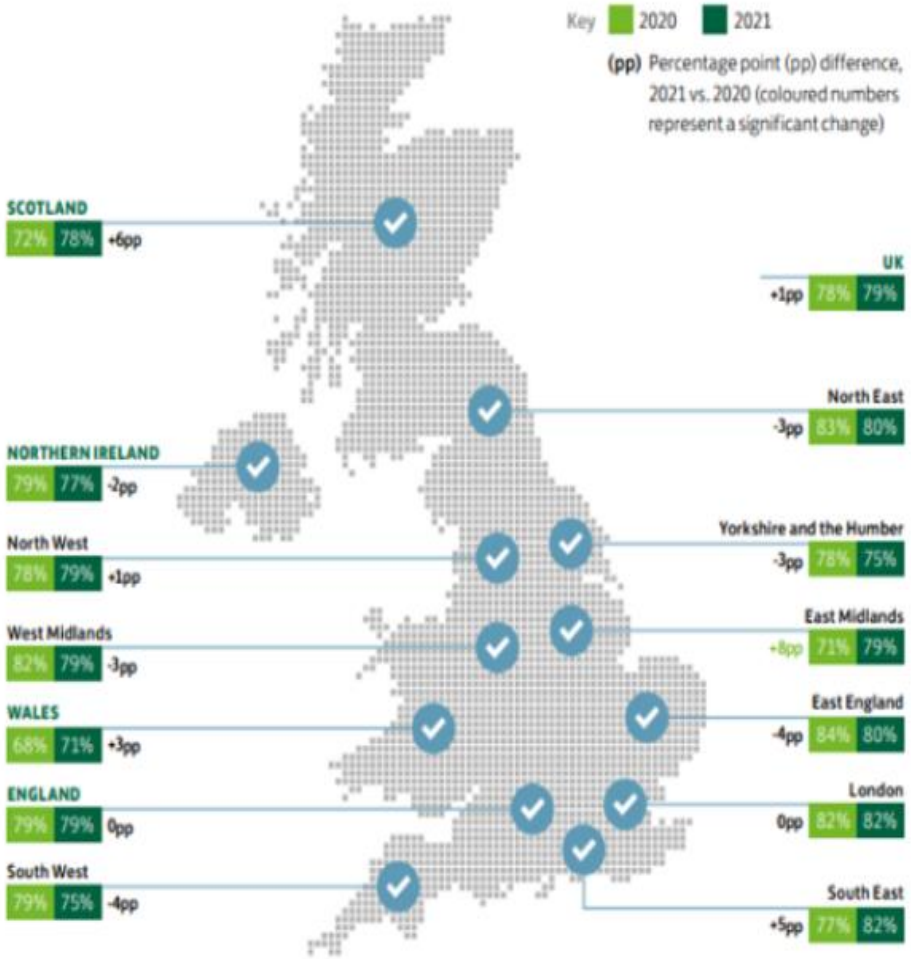
Consumer Digital Index

There is irrefutable evidence that the pandemic, as well as accelerating adoption of digital services, is also accelerating the digital divide - increasing the number of people facing digital poverty, and highlighting the adverse social and economic impacts this brings.

Digital Engagement

- The Lloyds Consumer Digital index identifies the **percentage of people with very low digital engagement as a barrier to growth.**
- The Lloyds Essential Digital Skills for Life report, published in 2021, looked at 29 life tasks across 5 life skills (**communication, transacting, problem solving, handing information & content and being safe & legal online).**
- As seen in the map, the East Midlands reports a significant change for the proportion of people aged 18 years and over that have life essential skills, with an increase of eight percentage points relative to 2020 (from 71% to 79%). As a result the **East Midlands moves from the bottom two regions in 2020**, along with Wales.
- In contrast, the West Midlands decreased from 82% in 20202 to 79% in 2021

Proportion of Adults Aged 18+ that have Life Essential Digital Skills, Split by Nation & Region, 2020 and 2021:



Lloyds Life Essential Digital Skills, 2021

Lloyds Consumer Digital Index

People who are out of work are even less likely to be digitally capable and confident. 31% of unemployed people have Low or Very Low digital capability versus 19% who are in the workforce. There is an opportunity to prioritise the estimated 1.7 million unemployed who will need digital access, proficiency, and engagement to find work in an increasingly online career marketplace.

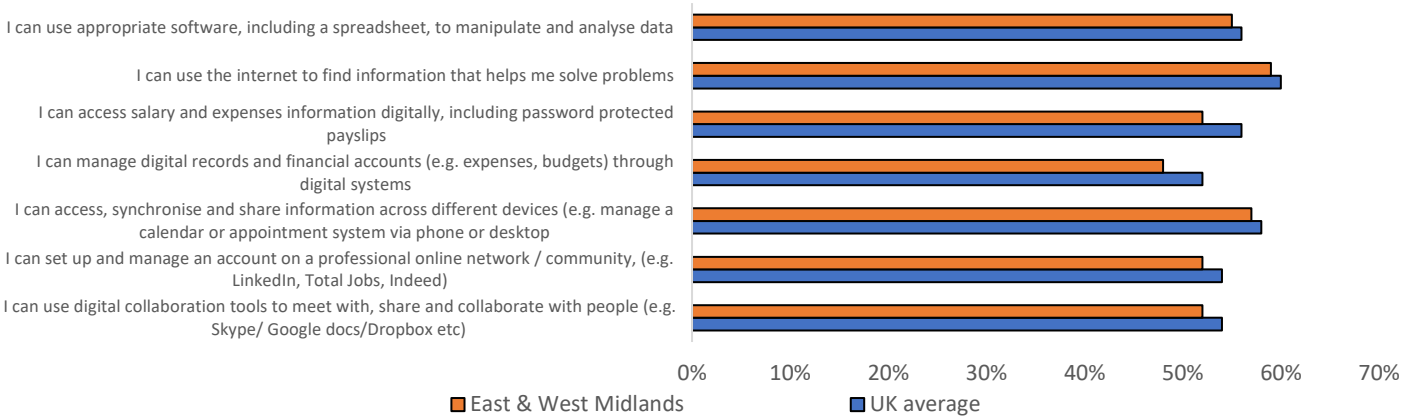
28% of people say they have upskilled themselves for work related reasons; 11% wanted to improve their job performance and productivity and 10% wanted to learn new skills to boost employment prospects.

The survey indicates clear motives to incentivise people in the future too – 77% would improve their digital skills if they thought it would directly help them with a day-to-day task or piece of work. 64% would prioritise digital skills if they knew it would help them progress in their job or secure a better role.

This is likely to be amplified by the socio-economic climate. People have shared their changing money mindsets. The pandemic has impacted people's financial priorities; 59% are now focusing on becoming debt free and 58% are reprioritising day-to-day spend.

Proportion of people who achieved a Work Skill, by region:

Source: Lloyds essential digital skills, 2020



For many of the work **skill indicators, people in the East and West Midlands perform worse than the UK average**. For example, only 48% of people in the East and West Midlands can manage digital records and financial accounts (e.g. expenses, budgets) through digital systems compared to 52% for the UK average.

As the figure below shows, both the East and West Midlands have the 3rd highest levels of people with very low digital engagement, at 30%, compared to the UK average of 29%. The East Midlands has the 3rd highest levels of people who are confident at using the internet at 86%, compared to the UK average of 85%. The West Midlands scored similarly at 85%.

Digital engagement and internet usage:

Key: 1st, 2nd, 3rd

		UK AVERAGE	SCOTLAND	WALES	East England	East Midlands	London	North East	North West	South East	South West	West Midlands	Yorkshire and the Humber	ENGLAND
BARRIERS	% offline (table ranked on this) n = 2,703	5%	4%	13%	8%	6%	3%	8%	4%	4%	8%	3%	4%	5%
BARRIERS	% Very Low Digital Engagement n = 999,149	29%	30%	33%	27%	30%	20%	32%	30%	27%	30%	30%	30%	28%
BENEFITS	% Net Confident using Internet (excluding offline) n = 2,559	85%	88%	88%	83%	86%	90%	83%	85%	86%	86%	85%	84%	86%
BENEFITS	% Wouldn't have coped through pandemic without tech (excluding offline) n = 2,559	53%	56%	48%	54%	48%	68%	54%	58%	50%	47%	53%	52%	53%
BENEFITS	% with net increase in Internet usage through pandemic (excluding offline) n = 2,559	55%	63%	53%	51%	54%	68%	46%	58%	57%	52%	52%	51%	55%
BENEFITS	% Digital skills have improved as a result of pandemic n = 2,703	29%	35%	23%	27%	26%	41%	23%	27%	31%	24%	27%	26%	28%

Consumer Digital Index

It has been well evidenced that the people using digital tools and services have a real advantage. **They are more likely to build their saving reserves, find new ways to save money and can more easily find and access new information, plus manage their wellbeing by keeping connected to loved ones.**

In the last year this moved from an advantage to a **necessity**. Shielding at home, and without the lifeline of the Internet, **5% of the population remain digitally excluded; locked out during lockdown**. For some, fears of the unknown or the threat of Internet scammers prevail, but for others a **lack of interest is a key barrier**. In the East Midlands digital exclusion stands at 6% compared to 3% in the West Midlands.

How internet usage has changed since the Coronavirus pandemic:

	Increased a little	Increased a lot	No real change/stayed the same	Decreased a little	Decreased a lot	Don't know/ Prefer not to say
East England	23%	28%	46%	0%	1%	3%
East Midlands	32%	22%	41%	3%	1%	2%
London	30%	38%	28%	1%	0%	3%
North East	20%	26%	49%	2%	1%	2%
North West	27%	31%	38%	1%	1%	2%
Scotland	31%	31%	33%	3%	1%	0%
South East	28%	29%	39%	2%	1%	1%
South West	28%	24%	45%	1%	0%	1%
Wales	21%	31%	44%	1%	3%	0%
West Midlands	21%	31%	44%	2%	1%	2%
Yorkshire and the Humber	26%	24%	46%	1%	1%	2%

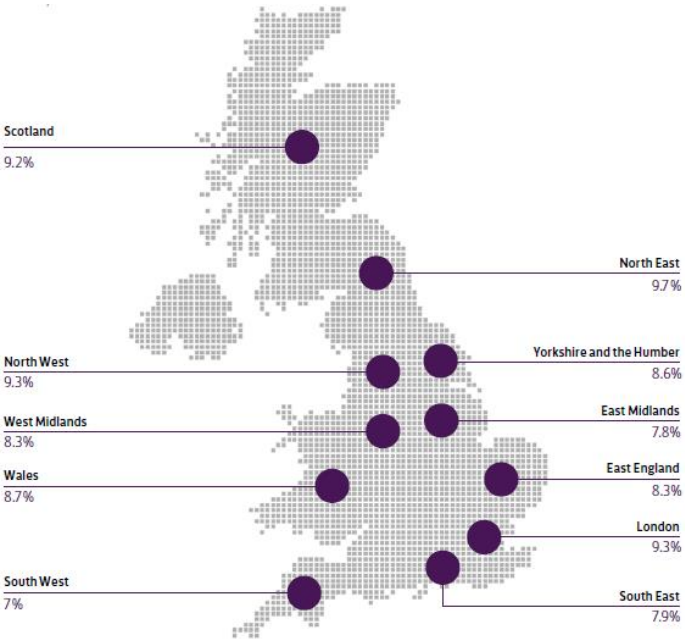
72% of online consumers have bought from an e-retailer they haven't bought from before; 67% have used a news site for the first time and 65% experienced their first video call. Nine-in-ten (91%) plan to continue habits like these in the future.

Increased online spend and number of online transactions since 2020, among online shoppers in both 2020 and 2021:

	Increased spend	Increased transactions	Average spend per transaction
East England	£1,828	28	£65
East Midlands	£1,278	30	£43
London	£2,343	25	£94
North East	£1,670	33	£51
North West	£1,913	32	£60
South East	£1,597	28	£56
South West	£1,433	27	£53
West Midlands	£1,996	30	£67
Yorkshire and the Humber	£2,100	33	£64
Scotland	£1,623	30	£54
Wales	£2,149	31	£69
England	£1,786	30	£60
UK Average	£1,796	30	£60

Access to digital platforms and payments is changing behaviours – the usage of 'Buy Now Pay Later' services has increased rapidly, altering the way that people spend and manage their money. **Broader Fintech services are used by 2.8 times more people than in 2020.** It is important that as new services are adopted, consumers are supported in using them to their benefit.

Proportion of people using 'Buy Now Pay Later' services, split by nations and regions, 2021:



A top trigger for improving digital skills in 2021 has been the need to work from home. 27% of people in the West Midlands have improved their digital skills as a result of the pandemic, compared to 26% in the East Midlands and 29% for the UK average.

The difference in lockdown working styles and requirements has meant parts of the UK workforce have digitised more rapidly than others – now job type doesn't just impact current income, but rather the level of digitisation and resulting broader lifestyle benefits. 93% of office workers are now confident Internet users versus 85% of manual workers, and they are 11 percentage points more likely (73% vs. 62%) to use the Internet to develop professionally and improve future work prospects. The data also shows increased personal use of the Internet, indicating a **halo effect** from the working day.

Source: Lloyds Consumer Digital Index, 2021

Digital Poverty

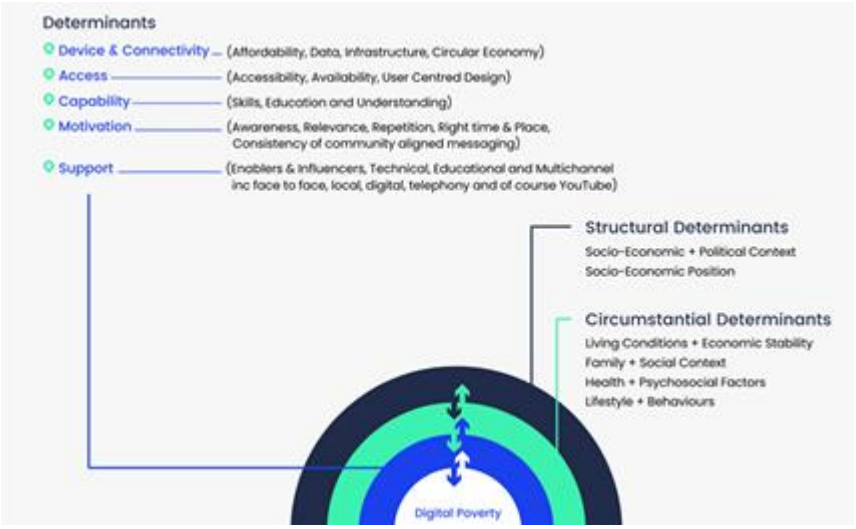
Digital poverty is the inability to interact with the online world fully, when, where, and how an individual needs to. It exacerbates and is exacerbated by other socio-economic, educational, racial, linguistic, gender, and health inequalities. It is both the product and the cause of other forms of socio-economic disadvantage.

The benchmark of digital literacy is always changing as the digital world evolves. Therefore, digital inclusion is not a tick-box exercise that, once completed, has been achieved for life. Rather, it is a **process of lifelong learning and adaptation that can be disrupted by systemic, circumstantial, and individual factors—meaning that people can fall in and out of digital inclusion at various points in their lives.**

Digital poverty is the result of multiple, compounding forms of inequality. It is as much a social problem as it is a technical one, and it does not exist in isolation.

Over the past year and a half, the COVID-19 pandemic has irrevocably thrust digital poverty into the national spotlight, as many aspects of everyday life moved online in order to mitigate the spread of the coronavirus. But not everyone was able to easily transition to a digital day-to-day existence. The pandemic crisis simultaneously exposed how many of our life realms have already been digitised, **how damaging digital poverty can be for individuals and society as a whole, and the need to plan for a future in which digital technology is likely to be a lifeline—or at its most consequential, a determinant of health and wellbeing.**

The five determinants of digital poverty



Big picture myths:

Demographic differences are the most important fault lines in the digital divide → Large datasets have given rise to the assumption that the digitally disadvantaged are mostly older people (pensioners and those over 75), and young people are "digital natives" with natural skills acquired by exposure to technology from birth. Mounting evidence tells us the real picture is more complicated than that, with **significant digital inequalities among young users and higher levels of digital engagement from older users than such assumptions would suggest.**

All access is equal (or: access is access) → This myth is rooted in the early narratives around the digital divide that focused on the absolute gap between digital technology users and non-users. Digital inclusion is still often treated like a switch that can be flipped from "off" to "on" when people can get online with a connected device. **Digital inclusion is a lifelong process rather than an event.** What are the factors that divide influence whether and how someone is digitally "included" over the course of their lifetime? What motivates people online or nudges them offline?

A joined-up digital poverty agenda requires top-down solutions → The overarching trend in digital inclusion policy is to implement programmes for helping people access the digital world as it already exists, which usually means expanding internet and device access. **This is rooted in a "build it and they will come" approach**; if they don't come, find out how to get them to come to what has already been built. But in some cases, even when they do come, they do not stay. **Evidence increasingly points to the fact that community-led digital inclusion strategies and user-driven or co-productive technology design are most effective at getting and keeping marginalised and vulnerable people engaged with the digital world.** For this reason the Digital Poverty Alliance advocates treating digital exclusion as everyone's problem and everyone's opportunity, requiring diverse, cross-sector approaches that also meet people where they already are. This myth leads us to ask: where does responsibility for different aspects of digital inclusion lie—with users themselves (skills) or with technology companies (design) or with government (standards)? How can diverse efforts be coordinated and supported to share best practice?

Source: Digital Poverty Alliance, 2021

Digital Poverty

Big picture myths:

Device and Connectivity

- **1 in 5 did not have access to an appropriate device** → Ofcom (2021) reports that 2% of school age children have only a smartphone to get online and one in five children who had been home schooling did not have access to an appropriate device.
- **Up to 42% of young people are not adequately connected** → Nominet Digital Youth Index (2021) reports that up to 42% of young people are not adequately connected, lacking either a home broadband connection or a laptop/desktop computer.
- **96% of UK properties have access to at least 30 mbps internet connection** → Ofcom (2020) reports that 96% of UK properties have access to at least 30 mbps internet connection, but that drops to 81% of rural properties, with differences among the nations --only 66% of rural properties in Scotland.
- **53% of those offline cannot afford an average monthly broadband bill** → Lloyds Bank (2021) reports that 33% of survey respondents said that lower cost would encourage them to use the internet and up to 53% of those offline cannot afford an average monthly broadband bill.
- **2.5 million people are behind on their broadband bills** → According to Citizens Advice (2021), 2.5 million people are behind on their broadband bills, with 700,000 people falling into the "red" on broadband during COVID.

Access

- **2.7 million people can access the Internet but lack the ability to use it** → Lloyds Bank (2021) reports that 2.7 million (5%) people can access the Internet but lack the ability to use it to its full advantage and 11.7 million people (22%) lack essential digital skills for everyday life.
- **Concerns with the dangers of the Internet** → The Oxford Internet Survey (2019) reports that non-users are 20 percentage points more concerned with the dangers of the Internet than users.
- **Disabled people are more than 10 percentage points more likely to be non-users** → The ONS (2019) reports that disabled people are more than 10 percentage points more likely to be non-users of the internet than nondisabled people.

Capability

- **11 million people still lack essential digital skills for life** → Lloyds Bank (2021) reports that 11 million people (22%) still lack essential digital skills for life, with lack of education, lower incomes, and older age all contributing to lower levels of digital skills.
- **Only 62% of search engine users could identify paid-for listings** → Ofcom (2020/21) finds that many adults in the UK lack key abilities for navigating the contemporary digital world --24% do not think about whether the information they find online is truthful or not and only 62% of search engine users could identify paid-for listings in search results.

Motivation

- **42% of offline users said "it's not for people like me"** → Ofcom (2020/21) reports that among offline users, 42% said "it's not for people like me, I don't see the need or I'm not interested".
- **"Doesn't interest them"** → Lloyds Bank (2021) reports that 33% of offline users say the internet "doesn't interest them"
- **Social grades D & E are 3.2x more likely to be non-users** → Research by The Good Things Foundation and Prof Simeon Yates (2021) finds that those in NRS social grades D & E are 3.2x more likely to be non-users saying "it's not for me" than those in social grades A & B and those who left education at or under 16 years are 2.8 times more likely to say "it's not for me" than those who left at 21.

Support and Participation

- **63% received support from a friend, family or neighbour** → The Centre for Ageing Better (2021) reports that of low-income 50-70 year-olds who asked for help using digital technology or the internet during the pandemic, 63% received support from a friend, family member or neighbour.
- **66% of people prefer to learn from friends, family, or work colleagues** → Lloyds Bank (2021) reports that when learning digital skills, 66% of people prefer to learn from friends, family, or work colleagues and 65% would prefer face-to face; in addition, only 64% of those who live alone have fundamental skills versus 87% of those who live in a household of two or more people.

Source: Digital Poverty Alliance, 2021

Appendix

Assessing the UK's Regional Digital Ecosystems

The box plot in the tables below indicates visually where the East and West Midlands (black dot) sits against the median (line), interquartile range (deeper blue) and range (lighter blue) of the UK NUTS1 regions. **Where the black dot is to the right of the median, the selected Midlands region is above the median value on this indicator.**

East Midlands - Digital Ecosystem metrics, relative to UK NUTS1 Regions

Indicator name	Period	EM	Box plot comparison	Lowest	25th centile	Median	75th centile	Highest
Digital sector % share of total enterprises	2020	5.9		3.0	5.6	6.3	7.7	14.1
Digital sector % share of employees	2019	2.4		2.1	2.8	3.0	3.5	8.4
Digital occupations % share of employment	2020	4.2		3.0	4.0	4.3	4.9	7.2
Digital sector % share of enterprise births	2019	5.5		4.8	5.4	6.0	8.0	12.7
Average annual growth in digital sector employees (% p.a.)	2015-19	3.2		-2.0	0.9	2.8	6.9	8.2
Average growth in digital occupations over 5 years (% p.a.)	2015-20	2.4		1.8	4.0	5.6	6.4	9.4
Digital sector % share of GVA	2019	3.6		3.4	4.0	4.5	5.1	12.3
Average real growth in digital sector GVA - 5 years (% p.a.)	2014-19	5.7		1.8	3.3	5.6	6.6	7.6
Digital sector GVA per hour worked (£/hour)	2019	37.1		29.8	36.6	40.7	45.1	62.4
Balance of international trade in digital sector services as % of GVA	2018	0.1		0.0	0.2	0.3	1.3	3.5
Earnings p.a. as % of house prices	2020	13.8		9.3	10.1	14.6	16.9	20.3
Average business floorspace per £1k rateable value (sq. m)	Mar-2020	19.2		4.1	13.4	16.8	17.9	19.2
Superfast broadband coverage (% of premises)	Jan 2021	95.8		89.1	93.1	95.6	95.7	96.0
Full fibre coverage (% of premises)	Jan 2021	15.1		10.5	15.8	19.5	22.3	60.7
Gigabit-capable coverage (% of premises)	Jan 2021	15.1		10.5	20.6	33.0	45.0	74.8
3yr survival rate of digital sector firms (%)	2016-2019	62.7		58.2	59.9	61.8	62.4	64.9
% of digital sector firms identified as 'high growth'	2020	0.9		0.9	1.4	1.8	2.9	5.7
Digital sector firms raising Angel Network funds	2016-20	5.0		2.0	5.0	11.0	17.3	110.0
VC investment in digital sector firms per capita (£)	2016-20	5.8		5.8	18.5	44.4	132.8	1256.7
Computer Science FTEs in REF2014	2014	145.5		60.8	99.1	137.0	188.6	413.8
Average % Computer Science research rated 4* in REF2014	2014	17.1		10.0	20.7	25.1	28.2	33.4
Digital sector R&D tax credit expenditure per enterprise (£k pa)	2017/18	14.2		13.8	16.5	19.0	22.3	75.6
Innovate UK grants in "AI & Data Economy" sector (£m)	2011-20	9.0		2.3	8.7	14.5	31.2	232.7
Digital sector university spin-outs per 1m pop	Apr 2021	1.2		1.1	2.7	3.8	5.2	7.3
HE postgrad computing students per 1k pop	2019/20	0.4		0.3	0.3	0.4	0.5	0.8
HE postgrad comp, eng & tech, and maths students per 1k pop	2019/20	1.2		0.7	0.9	1.2	1.4	1.7
Digital sector median gross annual pay (£k)	2020	30.2		30.2	32.6	34.9	38.8	47.4
Median gross annual pay for IT and telecoms professionals (£k)	2020	35.8		35.0	37.2	39.3	43.5	51.7
Proportion of people aged 16-64 with NVQ4+ (%)	2020	37.2		34.5	37.3	38.8	41.6	58.5
Proportion of people aged 16+ using the internet (%)	2020	91.4		88.2	90.6	91.2	92.6	95.1
Proportion of households with internet access (%)	Q1 2021	92.0		89.0	92.8	94.0	95.0	97.0
Proportion of internet users finding info online for work/study (%)	Q1 2020	50.0		23.0	36.8	42.5	52.3	67.0
% of first degree graduates that remain in the region	2016/17	56.9		51.7	61.1	69.9	75.7	87.8
HE computing students per 1k pop	2019/20	1.8		1.3	1.4	1.8	2.3	2.6

West Midlands - Digital Ecosystem metrics, relative to UK NUTS1 Regions

Indicator name	Period	WM.	Box plot comparison	Lowest	25th centile	Median	75th centile	Highest
Digital sector % share of total enterprises	2020	6.2		3.0	5.6	6.3	7.7	14.1
Digital sector % share of employees	2019	2.6		2.1	2.8	3.0	3.5	8.4
Digital occupations % share of employment	2020	4.5		3.0	4.0	4.3	4.9	7.2
Digital sector % share of enterprise births	2019	4.8		4.8	5.4	6.0	8.0	12.7
Average annual growth in digital sector employees (% p.a.)	2015-19	1.6		-2.0	0.9	2.8	6.9	8.2
Average growth in digital occupations over 5 years (% p.a.)	2015-20	6.9		1.8	4.0	5.6	6.4	9.4
Digital sector % share of GVA	2019	4.7		3.4	4.0	4.5	5.1	12.3
Average real growth in digital sector GVA - 5 years (% p.a.)	2014-19	7.6		1.8	3.3	5.6	6.6	7.6
Digital sector GVA per hour worked (£/hour)	2019	51.1		29.8	36.6	40.7	45.1	62.4
Balance of international trade in digital sector services as % of GVA	2018	1.4		0.0	0.2	0.3	1.3	3.5
Earnings p.a. as % of house prices	2020	14.0		9.3	10.1	14.6	16.9	20.3
Average business floorspace per £1k rateable value (sq. m)	Mar-2020	16.9		4.1	13.4	16.8	17.9	19.2
Superfast broadband coverage (% of premises)	Jan 2021	95.7		89.1	93.1	95.6	95.7	96.0
Full fibre coverage (% of premises)	Jan 2021	20.0		10.5	15.8	19.5	22.3	60.7
Gigabit-capable coverage (% of premises)	Jan 2021	51.6		10.5	20.6	33.0	45.0	74.8
3yr survival rate of digital sector firms (%)	2016-2019	60.8		58.2	59.9	61.8	62.4	64.9
% of digital sector firms identified as 'high growth'	2020	1.3		0.9	1.4	1.8	2.9	5.7
Digital sector firms raising Angel Network funds	2016-20	6.0		2.0	5.0	11.0	17.3	110.0
VC investment in digital sector firms per capita (£)	2016-20	19.7		5.8	18.5	44.4	132.8	1256.7
Computer Science FTEs in REF2014	2014	116.4		60.8	99.1	137.0	188.6	413.8
Average % Computer Science research rated 4* in REF2014	2014	25.6		10.0	20.7	25.1	28.2	33.4
Digital sector R&D tax credit expenditure per enterprise (£k pa)	2017/18	16.9		13.8	16.5	19.0	22.3	75.6
Innovate UK grants in "AI & Data Economy" sector (£m)	2011-20	13.4		2.3	8.7	14.5	31.2	232.7
Digital sector university spin-outs per 1m pop	Apr 2021	3.0		1.1	2.7	3.8	5.2	7.3
HE postgrad computing students per 1k pop	2019/20	0.3		0.3	0.3	0.4	0.5	0.8
HE postgrad comp, eng & tech, and maths students per 1k pop	2019/20	1.1		0.7	0.9	1.2	1.4	1.7
Digital sector median gross annual pay (£k)	2020	38.5		30.2	32.6	34.9	38.8	47.4
Median gross annual pay for IT and telecoms professionals (£k)	2020	43.0		35.0	37.2	39.3	43.5	51.7
Proportion of people aged 16-64 with NVQ4+ (%)	2020	37.1		34.5	37.3	38.8	41.6	58.5
Proportion of people aged 16+ using the internet (%)	2020	91.0		88.2	90.6	91.2	92.6	95.1
Proportion of households with internet access (%)	Q1 2021	97.0		89.0	92.8	94.0	95.0	97.0
Proportion of internet users finding info online for work/study (%)	Q1 2020	36.0		23.0	36.8	42.5	52.3	67.0
% of first-degree graduates that remain in the region	2016/17	67.1		51.7	61.1	69.9	75.7	87.8
Higher Education computing students per 1k pop	2019/20	1.9		1.3	1.4	1.8	2.3	2.6

Source: Department for Culture, Media & Sport, 2021

DISCLAIMER OF LIABILITY

Every effort is made to provide accurate and complete information however we make no claims, promises or guarantees and expressly disclaim any liability for errors, omissions or actions taken by others on the basis of information provided.

For any queries please contact Professor Delma Dwight: Delma_Dwight@blackcountryconsortium.co.uk

Black Country Consortium

Economic Intelligence Unit

MIDLANDS ENGINE

Economic Observatory