Artificial Intelligence 'New Economy' Cluster Snapshot

INSIGHTS

Artificial Intelligence (AI), or machine learning, offers growing opportunities and benefits for the Midlands Engine economy and society, revolutionising business productivity across sectors and facilitating unprecedented innovation.

A 2023 study commissioned by the Department for Science, Innovation and Technology (DSIT) estimates there are over 3,000 UK AI companies contributing £3.7bn GVA (Gross Value Added), with over 50,000 people in AI roles. The report highlights London, the South East and the East of England as accounting for 75% of UK AI activity, but clusters of activity exist elsewhere in the UK.

Underpinned by a growing set of AI-specific firms and other firms adopting AI technologies, the Midlands is one such emerging cluster. A thriving innovation and talent ecosystem provides the basis for the Midlands to capitalise on this AI opportunity, driven by a skilled, technical workforce and technology-led organisations like universities with AI-specific expertise.

Driving up AI investment from across the public, private and academic sectors will be critical to maximising the Midlands' AI potential, both its adoption across key industries (e.g. manufacturing, services, construction) and growing the region's technology service offer in itself.

There is currently limited data available for accurately quantifying AI activity in the UK and its regions. However, this document attempts to pull together available information about AI in the Midlands, produced by Midlands Engine Observatory. Due to the rudimentary nature of data in this sector, the findings should however be taken with some caution.

What is AI?

AI is one of the five critical technologies identified within **the UK Science and Technology Framework (2023)** and the **International Technology Strategy.** These define AI as:

"Machines that perform tasks normally performed by human intelligence, especially when the machines learn from data how to do those tasks".

It serves as a simulation of human intelligence via machine, encompassing the capacity of computers and systems to learn, reason, and make decisions by processing data.

One of the most common types of AI is generative AI which focuses on the creation of original content, data or information including images, text, voice and music, and data.

Methodology

This document's evidence collection has followed a similar process to the recent Midlands Engine **Exploring the Investment Potential of Midlands Clusters** report and its individual cluster snapshots.

It has been supported by the expertise of The Data City, especially its Real-Time Industrial Classifications (RTIC) methodology. The principal data source is the **Artificial Intelligence RTIC**, utilising The Data City's own AI-driven tool to identify companies operating in new economy clusters.

This tool allows us to investigate cluster features at the local level, helping us understand economic value and the firms driving it. The Data City identifies companies in the AI RTIC as those that have a specific focus and/or product offer related to AI as opposed to simply usage.

The Midlands Engine Observatory has collated further relevant evidence from other sources to supplement the insight provided by The Data City.

Midlands AI cluster in context

300+ businesses. 11% of the UK total. 122% growth since 2013.

11,000+ jobs - 8% of the UK total.

31 high growth companies (7% of the UK).

57 companies with £100m+ turnover.

6% of Midlands university graduates (8,385 in total) in 2021 studied subjects relevant to artificial intelligence, including from 4 of the top 25 UK universities for Computer Science.

10% The Midlands has received a relatively low level of funding in AI despite making up around 10% of the UK industry. For example, it has received less than 5% of relevant Innovate UK awards and less than 1% of total equity by high-growth companies in the sector.

INSIGHTS

Business ecosystem

315 total businesses active in the Midlands

- 11% of the UK AI company population; with 122% growth between 2013 and 2022.
- 57 £100m+ turnover companies - 21% of these strategic (£100m+ turnover) AI companies in the UK have a Midlands location.

31 high growth companies[1]

- 7% of the high growth AI companies in the UK have a Midlands location.
- 107 incorporations between 2017 and 2022
- 8% of UK AI incorporations between 2017 and 2022 have a Midlands location.

46 AI companies in the Midlands are identified as "scale-ups" and a further 19 "large scale-ups".

- 70 are highlighted as start-ups while 2 have been linked to a university spinout.

Cumulative Growth of Midlands Engine AI Companies 2000 - 2022 (+122% growth: 2013 - 2023)
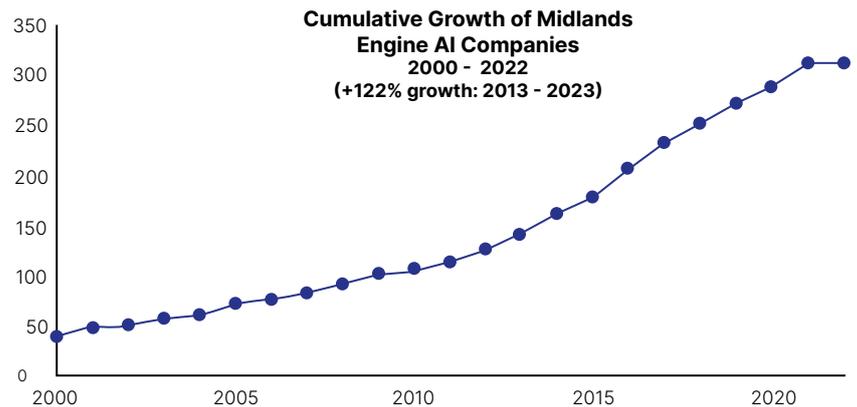
AI Companies by Company Stage (UK and Midlands)			
Company Stage	UK Companies	Midlands Companies	Midlands % of UK
Start-up	842	70	8.3%
Scale-up	477	46	9.6%
Large scale-up	209	19	9.1%
Unicorn	4	0	0.0
Established	450	63	14.0%
Other SME	976	117	12.0%
Total	**2,958**	**315**	**10.6%**
Linked to university spinout	57	2	3.5%

Companies working in AI and operating in the Midlands include:

Cyferd (Leicester)
Cyferd supply their customers with fully integrated, data-driven, AI-enabled digital transformation platforms, allowing firms to build and run all of their business processes and workflows in the cloud.

Magentus (Mansfield)
Magentus (previously Wellbeing Software) is a leading supplier of specialist clinical information systems, digital healthcare records and data management. Their healthcare software solutions have been trusted by hospitals and NHS Trusts for over 30 years, including the integration of AI.

FirstSource (Birmingham and Derby)
A global provider of business process management (BPM) services. It is a leading provider of transformational solutions and services spanning the customer lifecycle - including the incorporation of AI and other technologies - across Healthcare, Banking and Financial Services, Communications, Media and Technology.

Calligo (Coventry & Leicester)
Calligo provides data science, privacy, security and engineering with leading machine learning, data analytics and cloud platforms. This supports the operational, customer-centric and revenue-generation aspirations of companies and other organsiations.

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1 Estimated 20%+ company growth percentage per year

Innovation ecosystem

Midlands Universities have received £18.5m (3.6% of the UK total) UKRI funding for AI projects since 2017, according to **Gateway to Research.**[2] The top 5 Midlands university recipients in receipt of this are:

1. University of Nottingham: £6.7m+
2. Cranfield University: £3m+
3. University of Leicester: £2.1m+
4. University of Birmingham: £2m+
5. University of Warwick: £1.6m+

Since 2018 the Midlands Engine has received over £13m (3.5% of UK total) of Innovate UK funding with an average award of £135.7k.[3]

Innovation AI Projects funded by this include:

AI-driven Attack Graphs for Threat Modelling (ANTHEM)
(University of Loughborough/Warwick)
ANTHEM is the only AI solution that rapidly and autonomously generates attack graphs for threat modelling. It utilises an innovative technology to prioritise mitigation actions quicker and cheaper than any of its rivals.

Putting A Spin on Machine Learning, Atom by Atom
(University of Nottingham; £1.8m)
This project integrates artificial intelligence, surface science, and nanoscience to take the pain out of probe microscopy. This AI-enabled probe microscope will be used to carry out a programme of exceptionally challenging experiments whose common theme is the control of magnetism at the most fundamental levels: single domains, single molecules, single atoms, and single spins.

BREAKTHRU: developing soil compaction resistant wheat
(University of Nottingham; £1.1m)
To address the pressing need for improved crop yields to support a growing global population, the BREAKTHRU project aims to enhance wheat's resistance to soil compaction, ultimately contributing to food security in the UK. The research will employ advanced imaging and artificial intelligence techniques to assess whether the chosen wheat varieties are able to absorb nutrients and water in compacted soil more effectively.

Relevant high performing HEI research
There are 7 Midlands universities with high Research Excellence Framework performance in relevant subjects:[4]
- Coventry University
- Loughborough University
- University of Birmingham
- University of Nottingham
- University of Leicester
- University of Lincoln
- University of Warwick

Talent ecosystem

11,004 estimated employees across these AI companies[5]
- 8.2% of all UK AI employees

8,385 graduates in relevant subjects[6]
- 6% of Midlands graduates studied relevant subject to Artificial Intelligence

Spatial concentrations of talent in the Midlands include Greater Birmingham, Leicester, Derby, Coventry & Warwickshire and Nottinghamshire. See the map on the opposite page which shows the estimated number of employees across the Midlands.

2 Projects reported to reference 'Artificial Intelligence'
3 Innovate UK Award Data
4 REF 2021 GPA >3.0 in any of Computer science and informatics; Mathematical Sciences
5 The Data City 2023
6 Graduates from relevant subjects 2021 (HESA): Information technology; Mathematics; Computer science; Information systems; Software engineering; Artificial intelligence; Computer games and animation; Business computing; Others in computing.

Key Innovation Assets

1. Artificial Intelligence Innovation Network (Warwick Business School)

2. Aston Digital Futures Institute (ADFI)

3. Coventry University Technology Park **Safety Pool™**

4. Cyferd AI Research Hub (Leicester)

5. Faculty of Science Doctoral Training Centre in Artificial Intelligence (University of Nottingham)

6. Lincoln Centre for Autonomous Systems

7. PathLAKE (Pathology image data Lake for Analytics, Knowledge and Education)

8. Satellite Applications Catapult Centre for Excellence (University of Leicester)

9. STEAMhouse (Birmingham City University)

**10. The Institute for Interdisciplinary Data Science and AI** (University of Birmingham)

11. The UK Quantum Technology Hub for Sensors and Metrology

12. University of Loughborough including the **Centre for Intelligent Automation**

Artificial Intelligence
Estimated Employee Count

- 1,000 to 4,900
- 500 to 1,000
- 250 to 500
- 100 to 250
- 0 to 100

Stoke-on-Trent

Derby

Birmingham

6

5

12

4 & 7

2 & 10

1, 3 & 7

Lincoln

Nottingham

Leicester

Coventry

MIDLANDS ENGINE
OBSERVATORY
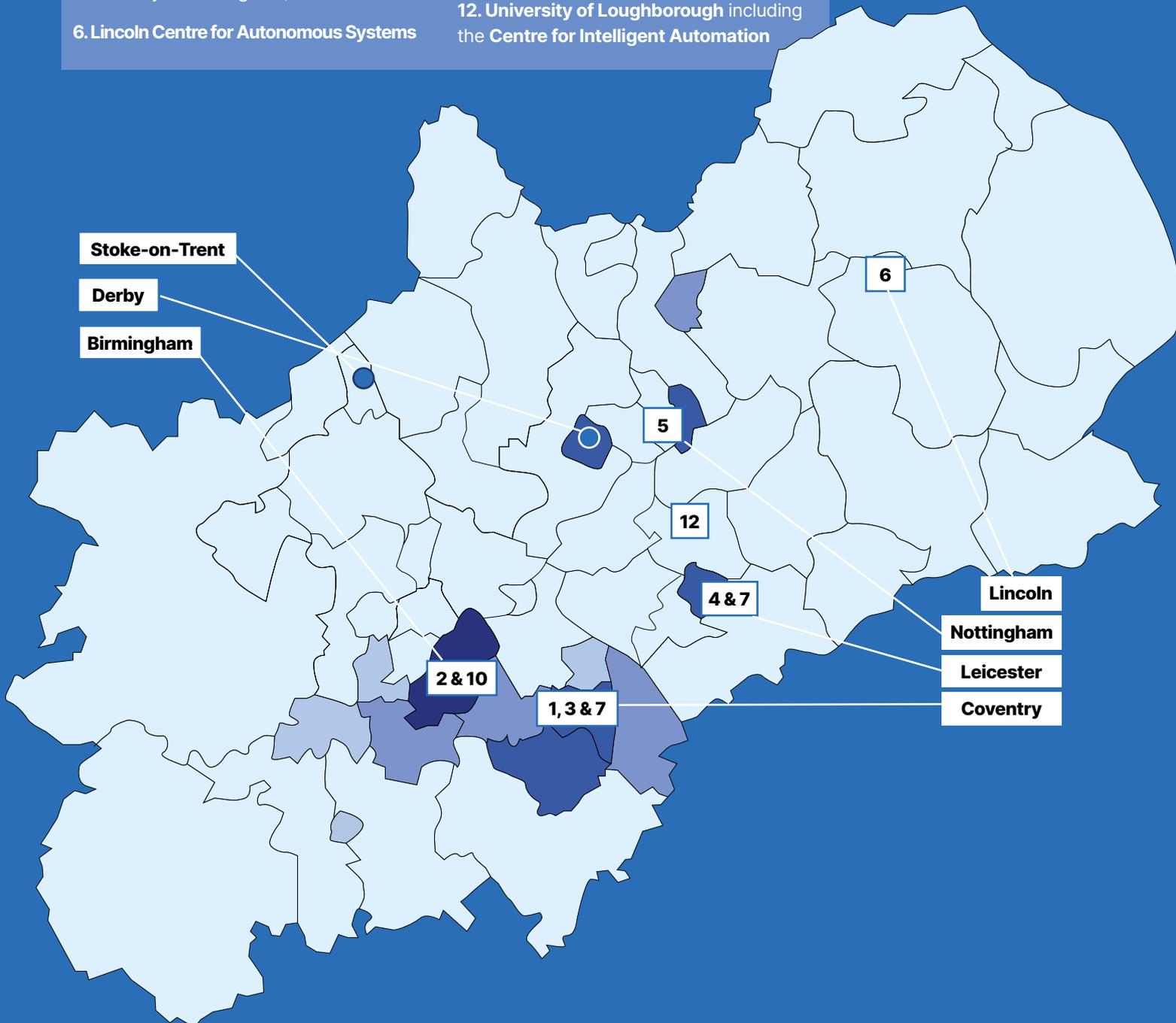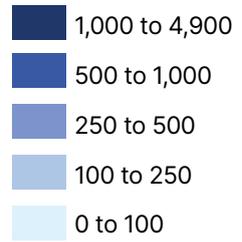
Investment ecosystem[7]

Encompassing artificial intelligence, software, and cyber security, Wavteq find the following about Midlands investment in digital industries:

Investment Metric	Investment Amount
FDI Capex 2017-21	$650.1m; 3% of UK total
DDI Capex 2017-21	$5.22bn; 26% of UK total
Fundraising Volumes	Mean av. £646k fundraising investment; £676m in 1,047 investments (inc. £45.3m across 590 seed investments; £395.5m across 328 venture investments).
DDI Jobs 2017-2021	44,276 jobs; 34% of UK total
FDI Projects 2017-2021	79 projects; 4% of UK total
DDI projects 2017-2021	179 projects; 14% of UK total

The Data City[8] has identified £39m worth of investment into Midlands companies including:

- **Geospatial Insight Limited** (Birmingham)
- **Grid Edge Limited** (Birmingham)
- **Voxpopme Limited** (Birmingham)
- **Predictiva Ltd** (Leicester)

However, similar to the software companies in the Midlands, AI companies in the area are underfunded in comparison to the rest of the UK.

0.71% of the total equity received in the UK from 2017 to 2021 by high-growth companies in this sector, despite making up 10.4% of the sector's population. They also received 4.82% of all grant money received by companies in this sector.

This could be due to a focus by funders on AI companies in more established tech hubs of the UK, particularly those in close proximity to academic institutions with AI specialisms, such as Oxford, Cambridge and London.

Midlands-based AI companies raised just

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7   Wavteq 2022. Note broader digital sector definition than just artificial intelligence.
8   Dealroom and The Data City, 2023. Companies registered as active in the Midlands since 2009.