

Emerging Tech Report | 2020

Date: February 2020



THE DATA CITY

Contents

Introduction	3
Background	3
Findings summary – The top 10 cities.....	5
Emerging technologies and sectors	6
Service Design	7
eCommerce	10
AI and Data Science	13
Cyber (Security)	16
Internet of Things	19
MedTech	22
FinTech	25

Introduction

In early 2019 The Data City reached a key milestone; successfully classifying, using machine learning and AI, over 1 million UK organisations into their relevant industries. Using its unique dataset, The [Data City](#) has completed analysis of the emerging technologies and sectors landscape and made comparisons across the UK in terms of organisations and events and made global comparisons in terms of academic activity. The work involved the analysis of 500 thousand technology events, 200 million scientific papers and patents, and 3.8 million web presences of UK registered companies.

There was also further research to uncover the affordability of businesses locating to UK cities. The open data we used for this was [Rateable Value](#)¹. The latest datasets published 1st April 2017, hold rating list information for 2 million current commercial properties and corresponding 1.9 million summary valuations. This data is available from VOA rating list downloads.

In this report we have ranked the top ten cities in the UK by the quantity of organisations which constitute as a digital organisation then subsequently ranked their quantity of events and the average rateable value per standardised city. The ranks have been summed together to create an overall score in which a lower combined score equals a higher overall ranking. If the combined score for a given city is the same value as another city, the overall rank is decided by the amount of organisations.

This report was created in partnership with MIDAS and GMCA to help identify the industry strengths of Manchester in comparison to other areas of the UK.

The collected values included in this research can be accessed here:

[Organisations Explorer](#)

[Events Explorer](#)

Background

[The Data City](#) uses the web, open & licensed data integrated with data science, machine learning and artificial intelligence to create a unique dataset. Our research has, for the first time, allowed us to provide data and insight for emerging technologies, that traditional economic data [SIC Codes](#) do not provide.

The quantity of papers published by city and number of citations to papers published and patents filed has been included to show the quantity and quality of research within a given city. Research begins with building familiarity with what has gone on before, it is the process of incremental improvement of the understanding of the scientific community. Academic institutions value authenticity and

¹ <http://bit.ly/2NnJBoH>

researchers strive to deliver high-impact, quality research, which is often difficult to measure, thus citations are often used as a proxy.

In parallel with this project The Data City has published the [UK Tech Census](#). This report does not include rateable value data and rankings but does place each UK city in context in terms of emerging technologies in the UK and uniquely provides us with real-time consistent data enabling us to make real comparisons across the UK. We present our commentary on headline insights from this work in the section below. It provides an analysis of emerging technology fields and themes across the UK. The data has been visualised and presented and you can access the [interactive data tool](#).

The boundaries used in this report have been standardised by the OECD. For more information on these boundaries see: [ODI OECD12](#) and [OECD](#).

Note: The table below ranks Manchester first due to the average rateable value of commercial property within Manchester, however it should be noted that London's sheer quantity of organisations will almost inevitably top these tables.

Findings summary – The top 10 cities

Top ten ranking results from the UK's largest 29 cities: Aberdeen, Birmingham, Bradford, Brighton, Bristol, Cambridge, Canterbury, Cardiff, Dundee, Edinburgh, Exeter, Glasgow, Lancaster, Leeds, Leicester, Liverpool, London, Manchester, Milton-Keynes, Newcastle, Norwich, Nottingham, Oxford-Didcot, Plymouth, Portsmouth, Reading, Sheffield, Swansea & York

	Overall Rank	Events Count	Rank	Organisations Count	Rank	Average RV (£/m2)	Rank
Manchester	1 st	1789	2	18926	2	130	5
London	2 nd	23404	1	235479	1	270	10
Birmingham	3 rd	932	5	11911	6	125	3
Bristol	4 th	1576	4	8005	8	125	3
Milton Keynes	5 th	405	10	15367	5	90	1
Leeds	6 th	675	8	8691	7	105	2
Edinburgh	7 th	1691	3	6487	9	N/A	5
Brighton	8 th	876	6	18391	3	140	9
Reading	9 th	745	7	17618	4	135	8
Glasgow	10 th	556	9	5968	10	N/A	5

This data shows that:

1. Manchester is clearly the UK's top digital technology city. The data relating to organisations shows that it outperforms all cities outside London, in all of the areas of emerging technologies referenced in this report. This is across the board, not only in the individual sectors, which means that Manchester's emerging technologies sector is broad and deep and is ranked first when we considered cost factors such as rateable value.
2. When you consider the number and comparable research institutions in London, the relative levels of government investment and overall imbalance of investment towards London, arguably cities like Manchester, Birmingham and Bristol are punching way above their weight.
3. We have clear evidence to demonstrate that in the emerging sectors and growth sectors of the future e.g. Cyber, AI and Data, Service Design, Construction Tech, MedTech - Manchester has a broad and deep capacity and capability. It's worth noting that Brighton and Reading also have a large number of organisations with skills in these sectors.
4. The events data shows that the Manchester digital data & technology eco-systems are established and functioning at a level above all other cities in the UK except London. We have significant evidence of user groups and technology meetups for all aspects of the emerging tech system. Manchester, London Bristol and Edinburgh demonstrate collaborative environments which are an essential ingredient for successful emerging technologies sectors and businesses to thrive.



Emerging technologies and sectors

The following are a sample of the sectors and emerging technologies analysed due to their uptake across many businesses.

Since our data looks at: the total number of organisations, the total number of published papers and patents, and the total number of events, it is almost inevitable that London tops these tables since we are looking at total count. For this reason London will often dominates the charts and data, therefore we ignore the capital and draw a comparison between the rest of the UK.

Service Design

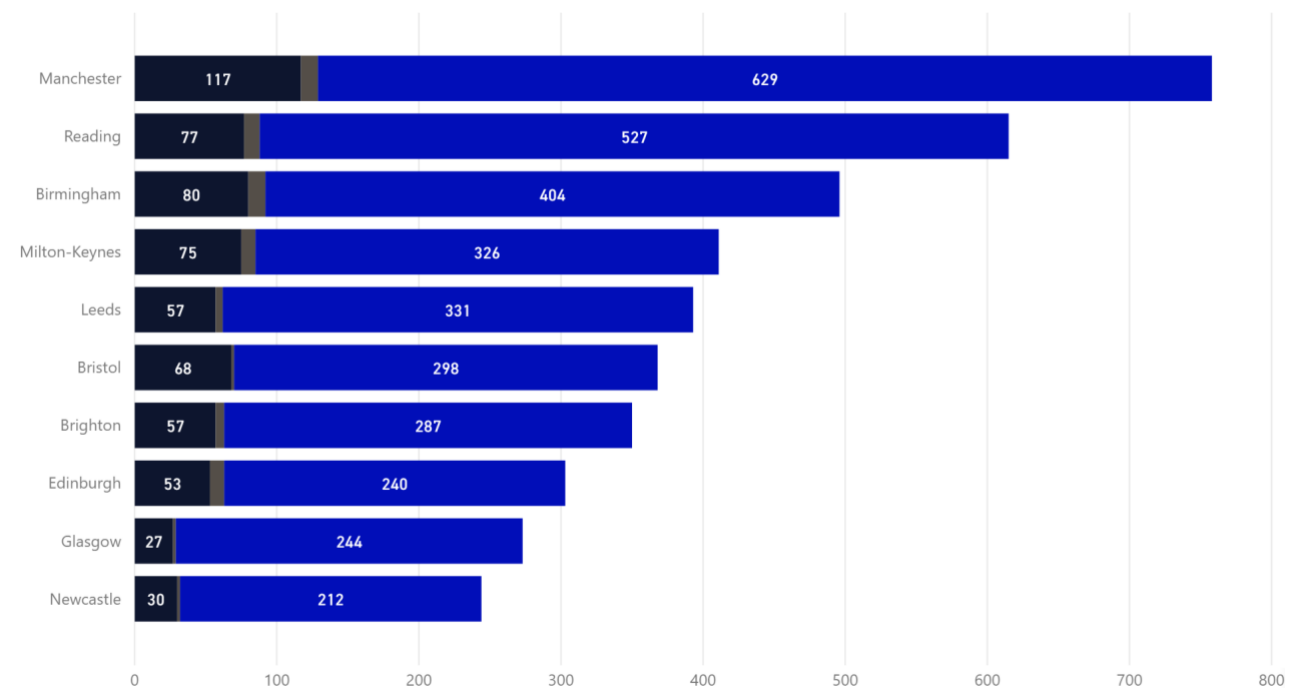
Introduction

Service design as a research field emerged from studies of advertising and business management and has matured today into an increasingly widely used process for changing a business, often using technology, to relentlessly focus on customer needs and desires. The transition is often accelerated by a need to embrace eCommerce and move sales by advertising online. Service design encompasses all the disciplines that the digital economy is using to build the services of the future and drive the exciting digital transformations that we know are happening to all parts of the economy.

Organisations

Companies with websites containing the following keywords:

SectorKeyword ● Customer Journey ● Platform as a service ● User experience

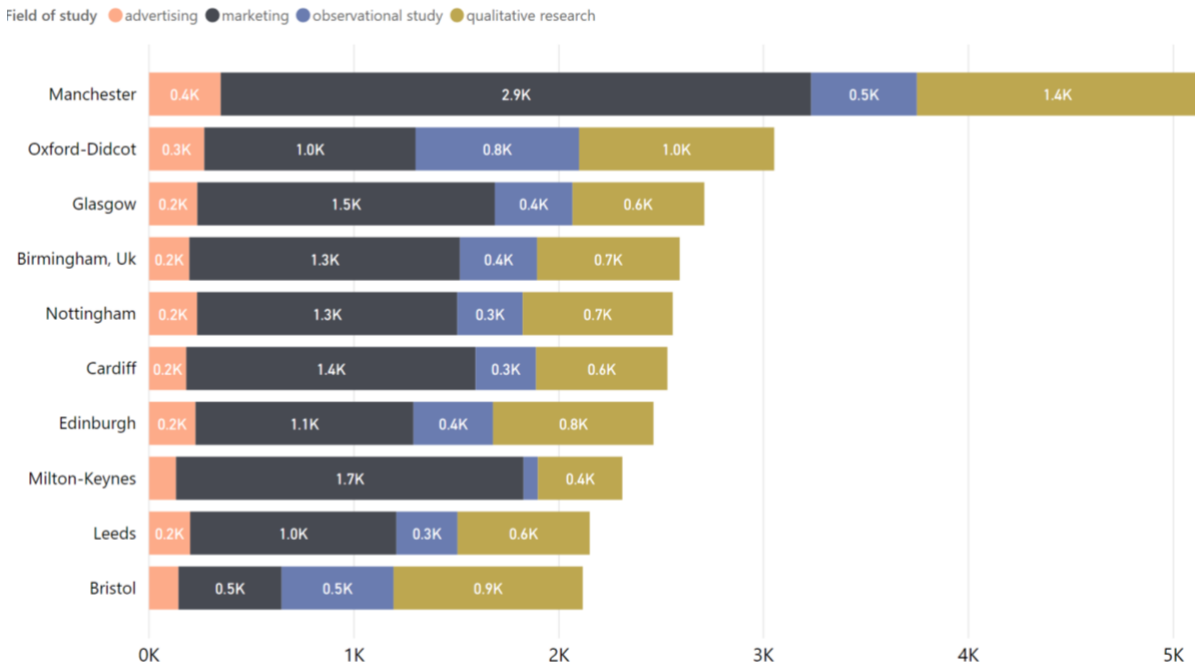


- **Manchester is the top ranked city for organisations websites which contain keywords that relate to service design. Manchester has around 750 different organisations. Reading is second to Manchester with 615 organisations.**
- Contrary to the above, using the Machine Learning Classification on our website, [Brighton ranks first in the number of organisations that have been classified as Service Design \(8,402\), Manchester is ranked second \(8,051\).](#)

2 Using the Data City's keyword data visualisations which consider keywords in companies' websites, outside of London. Keywords used: User Experience, Platform as a Service, Customer Journey.

Research

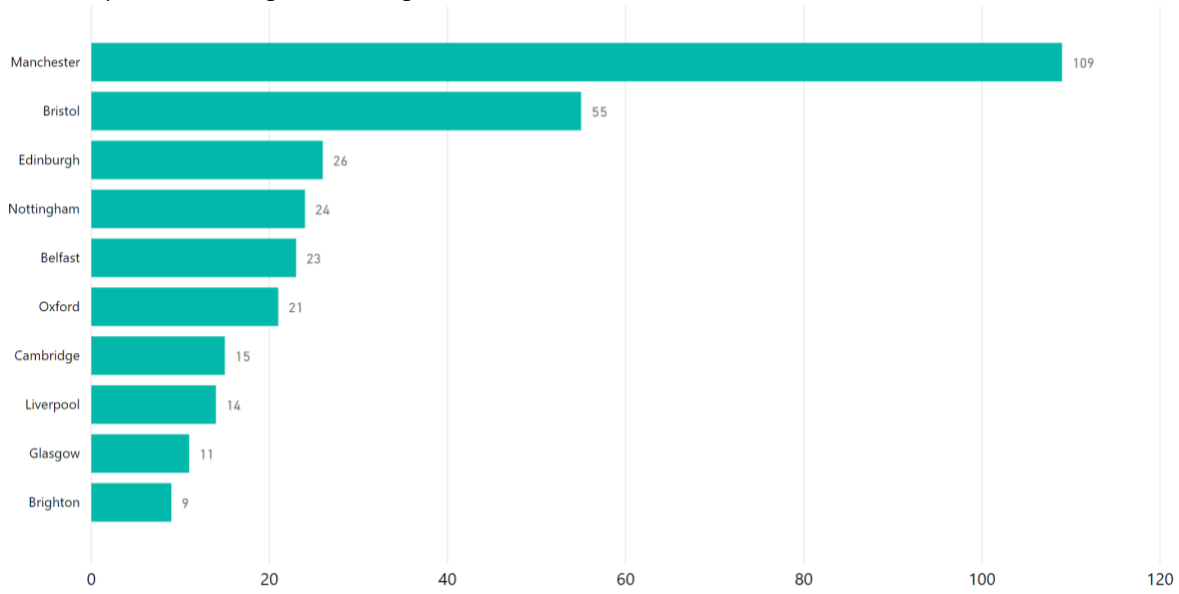
Papers published and patents filed by city:



- **The Data City's Data demonstrates that Manchester is delivering a substantial amount of research in advertising, marketing, observational study and qualitative research. For a company considering relocation, the strength of research and training in fields related to service design at institutions across the city region, should be of interest too.**

Events

Event descriptions containing 'service design' in the last 18 months



- Last year over 109 events were held on service design (more than one per week) and Manchester is the top ranked city³, almost double the next most active city Bristol.
- [Manchester is recording 1153 classified events hosted on Eventbrite and Meetup since January 2018 which are related to Service Design.](#) Only Edinburgh and Bristol record similar figures, 1056 and 1004 respectively.

³ Outside of London.

eCommerce

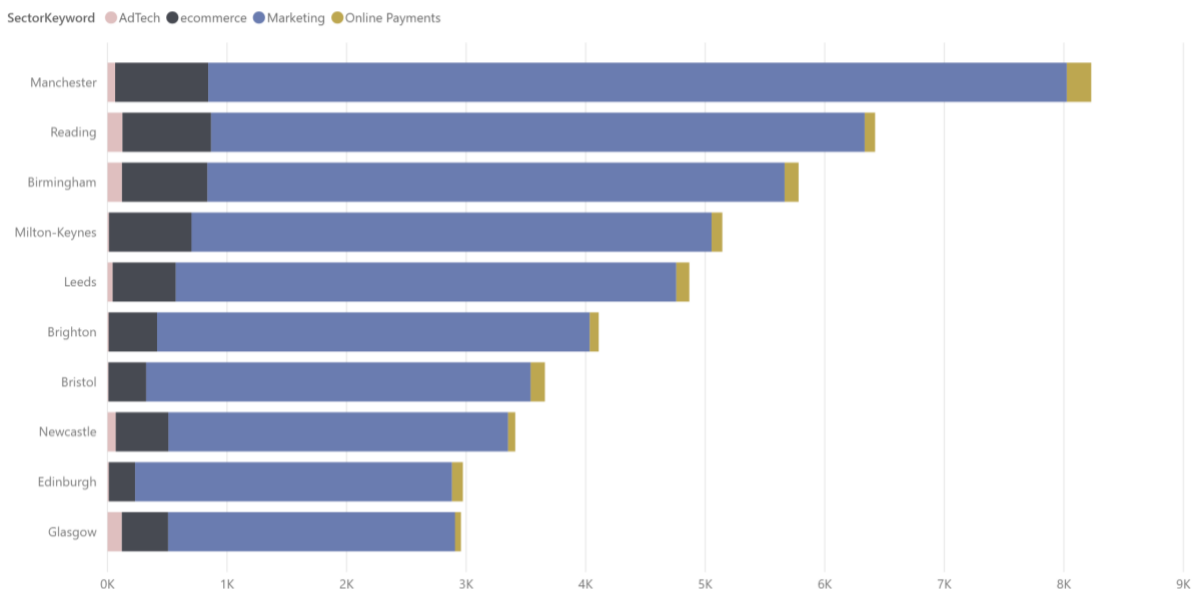
Introduction

eCommerce is growing at an unprecedented rate all over the world due to the increased connectivity each consumer possesses. The increased usage of the web, increased ownership of a smartphone with upgraded speeds, increased network coverage and faster online payments are all positively contributing to a cultural shift in primarily shopping online. The rise in using AI within eCommerce is helping to understand the differences between each consumer when choosing to shop on their site, there is a cultural shift towards the web.

Retailing is now an online activity, increasingly on mobile devices, supported by the physical infrastructure of shops, warehousing and delivery services. All of which is underpinned with and by data.

Organisations

Companies with websites containing the following keywords:



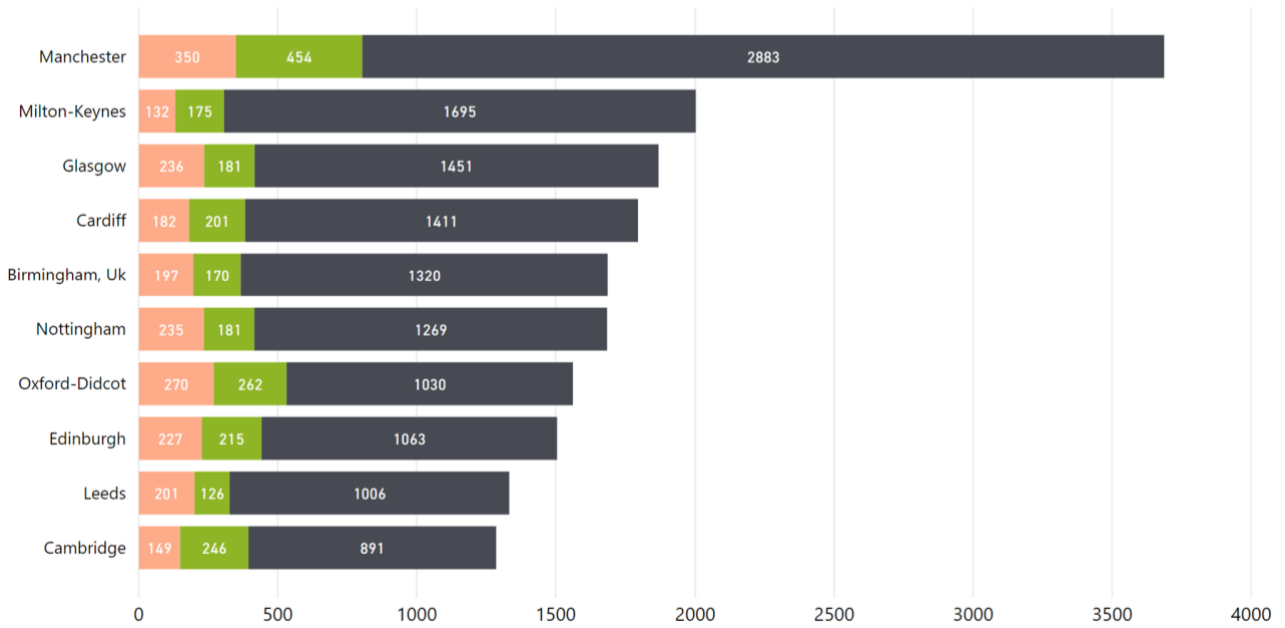
- **4Manchester ranks first with the total amount of companies (8,200) that include keywords related to ecommerce, over 1500 more than the second ranked city Reading (6400).**
- **[2863 organisations have been classified as eCommerce organisations based in Manchester making Manchester the top ranked city in the UK. This is over 1000 organisations more than the next city which is Birmingham with 1790 organisations.](#)**

4 Outside of London, keywords used: AdTech, eCommerce, Marketing and Online Payments.

Research

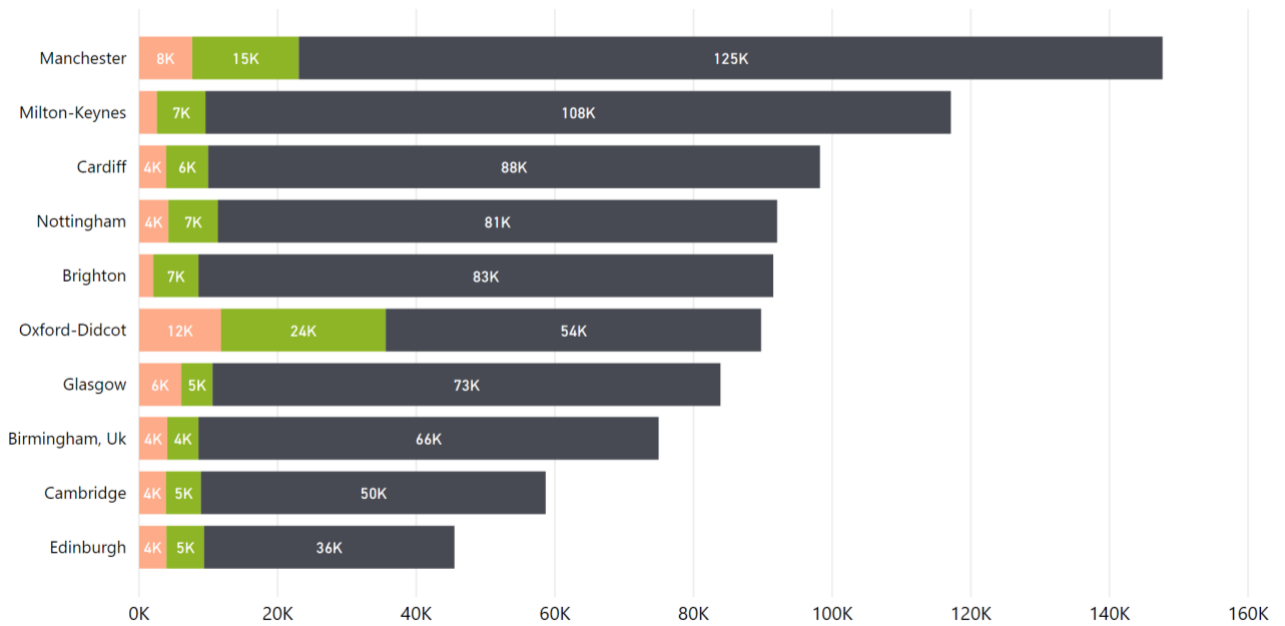
Papers published and patents filed by city:

Field of study ● advertising ● commerce ● marketing



Citations to papers published by institutions:

Field of study ● advertising ● commerce ● marketing



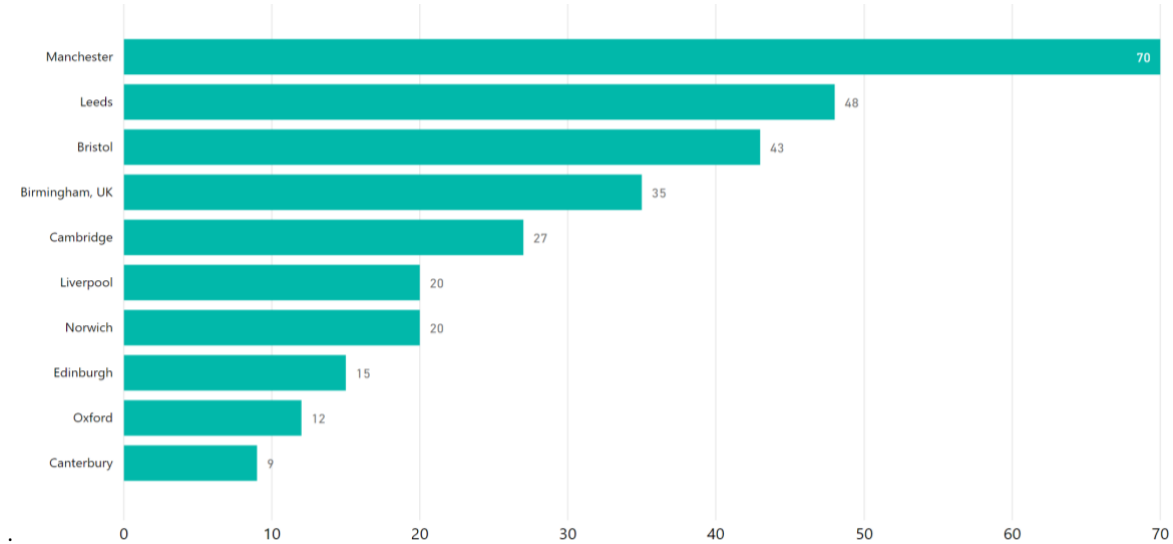
- **Advertising, commerce and marketing combined have nearly double the amount of papers published in Manchester compared to every other city in the UK, however with fewer research institutions compared to London it is arguably competing favourably.**

5 With the exception of London.

- **6Manchester is ranked first in the total amount of citations to papers and patents filed in the fields related to eCommerce, around 150,000. This is almost 30,000 more than the second most city, Milton Keynes.**

Events

Event descriptions containing 'commerce' in the last 18 months



- **7Manchester hosts the most eCommerce events. It has hosted 70 different events which contain the keyword 'commerce', 22 more than the next top ranked city Bristol (48).**
- **[Manchester has hosted 1221 classified events which relate to eCommerce since January 2019. This is double the likes of Cambridge \(651\), Brighton \(644\) and Birmingham \(620\).](#)**

6 Using the keyword data visualisations supplied by The Data City.

7 Considering the keyword data visualisations provided by The Data City.

AI and Data Science

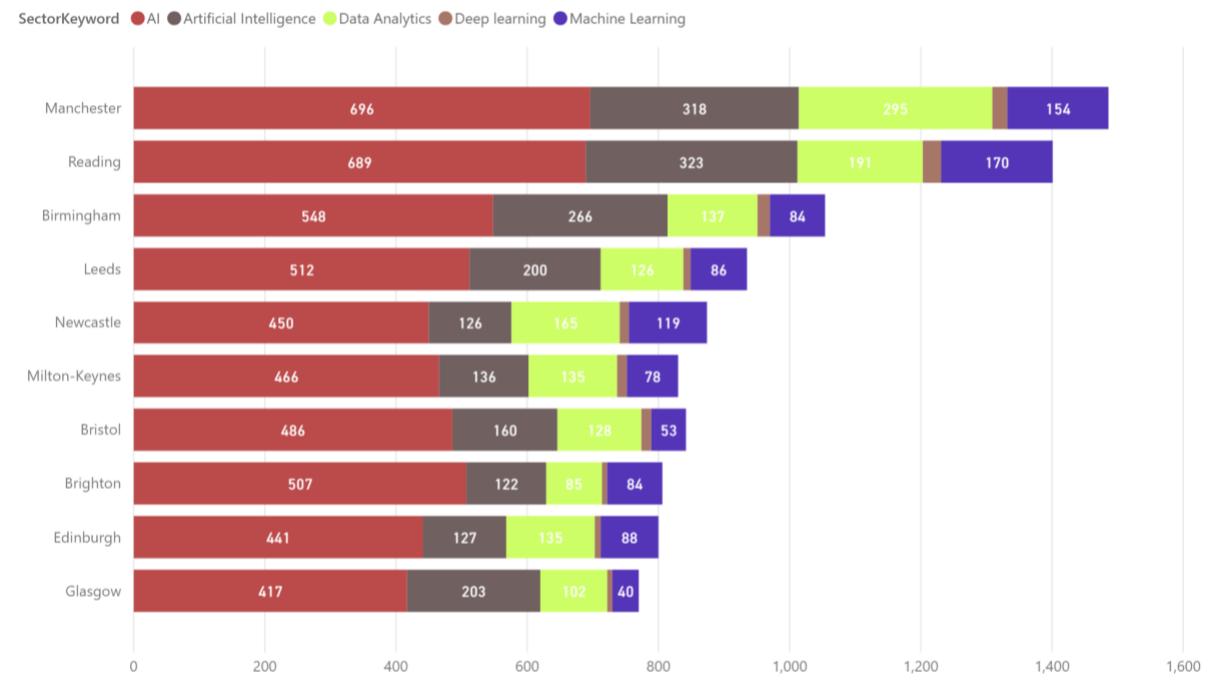
Introduction

“Data science and artificial intelligence will change the world” - Turing Institute.

Artificial Intelligence and Data Science, powered by ever more available computing power are becoming ubiquitous technologies that can be applied in many contexts, across many sectors and are disrupting and changing the way research, development and business is executed.

Organisations

Companies with websites containing the following keywords:



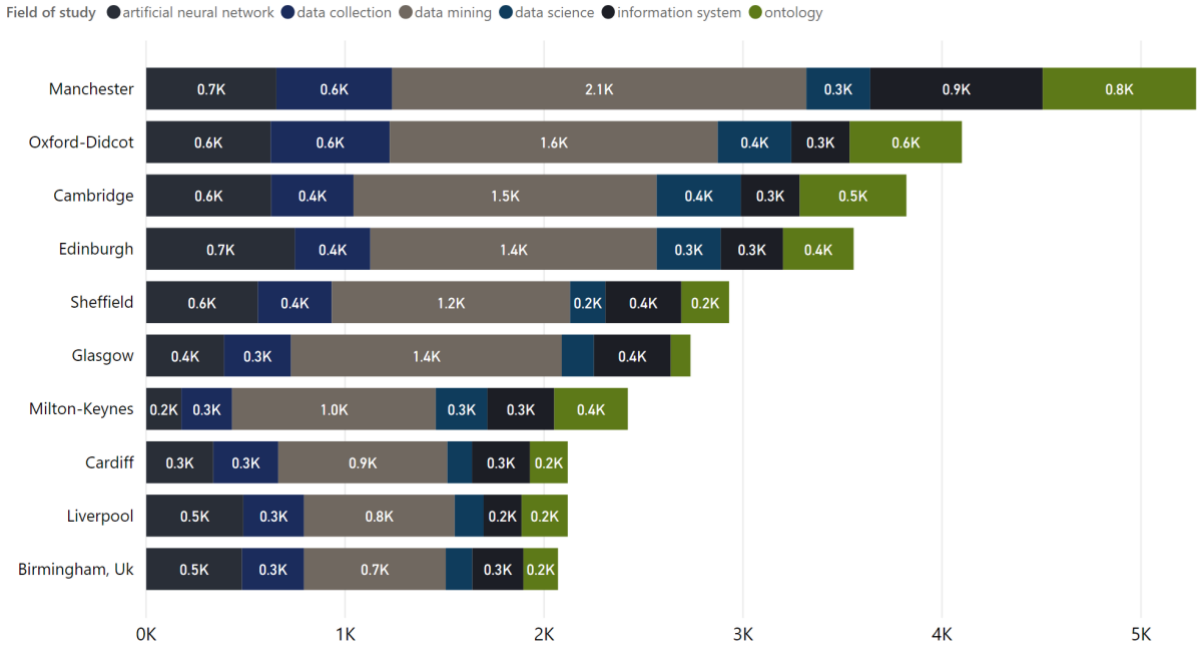
- **8Using the keyword data visualisation above, Manchester is the highest ranked city in the UK. Just over 1,400 organisations are located in Manchester, 500 more than the likes of Birmingham and Leeds.**
- **9In AI and Data Science, Reading is the top ranked city in the UK (403), 8 more than second place Manchester (395).**

8 Considering the keyword data visualisations and identifying keywords which relate to AI and Data: AI, Artificial Intelligence, Data Analytics, Deep Learning and Machine Learning.

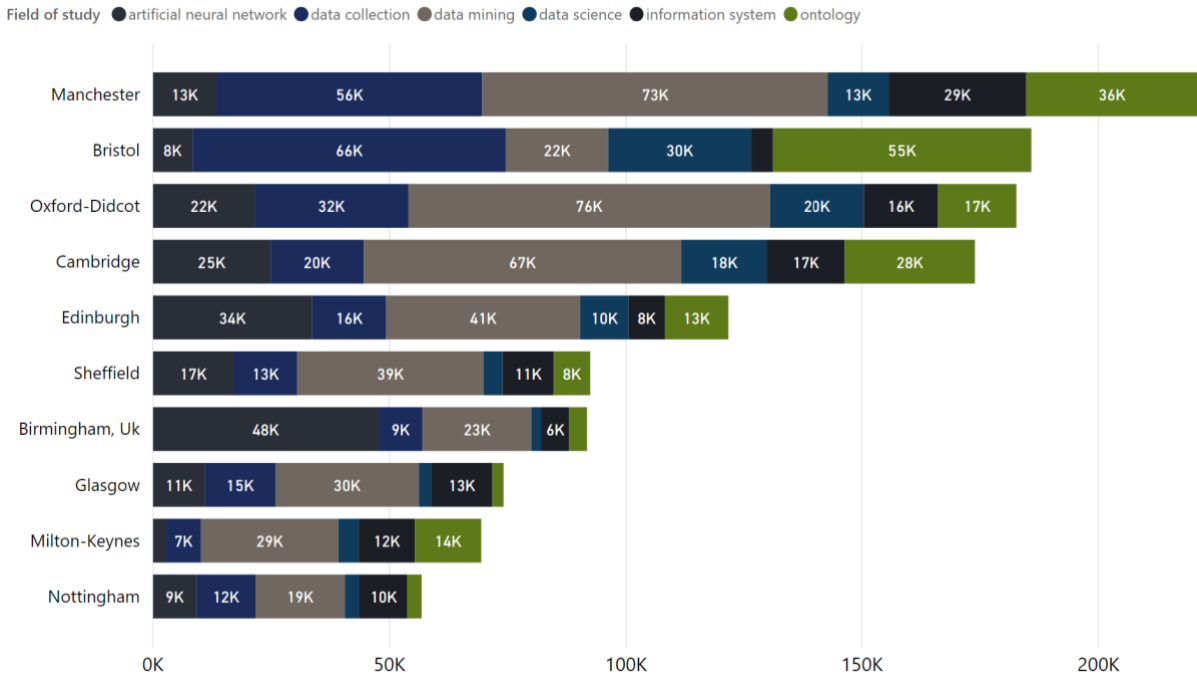
9 Using The Data City's machine learning classification.

Research

Papers published and patents filed by city:



Citations to papers published by institutions:



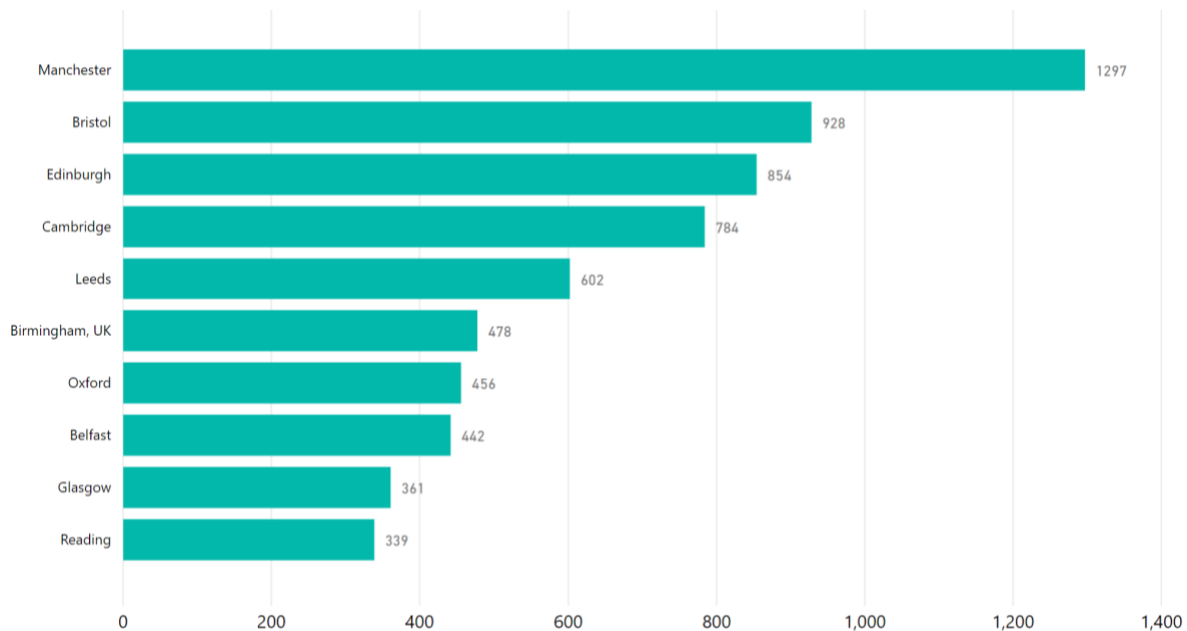
- From an academic and research perspective, Manchester is publishing the highest volume of papers¹⁰ (over 5000), more than 1000 more than the second highest ranked city (Oxford).

¹⁰ Outside of London.

- ¹¹Manchester is the top city ranked by citations to papers and patents, recording over 200,000 citations to papers. Over 73,000 citations are attributed to data mining, an important aspect of AI.

Events

Event descriptions containing 'AI' in the last 18 months



- When looking at event descriptions by UK city which contain the keywords 'Artificial Intelligence' or 'AI', Manchester has hosted 1297 different events making it the top ranked city.
- ¹²Manchester [hosts the highest volume of classified events](#) in AI and Data Science (145). In comparison to other cities, Manchester has hosted 30 more than the second highest rank city Edinburgh (113) and almost three times as many as the likes of Oxford (56) or Leeds (53). These events have been collected from *Eventbrite* and *Meetup* since January 2018.

¹¹ Outside of London.

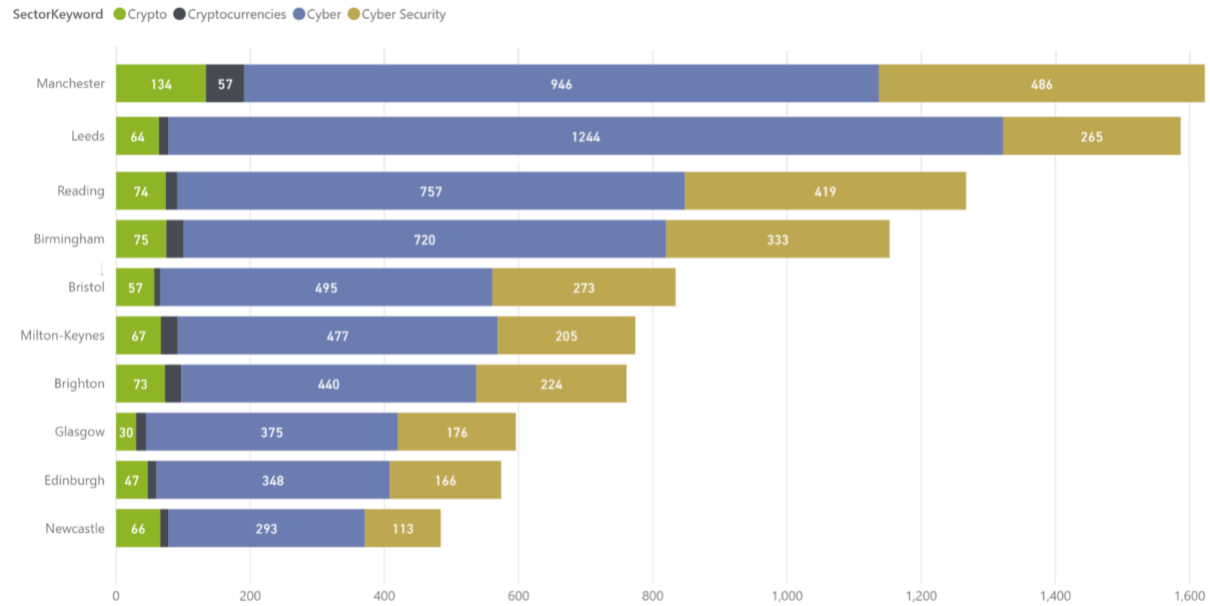
¹² Using The Data City's events explorer, comparing AI and Data events to other cities in the UK, outside of London.

Cyber (Security)

Cyber security is part of the underpinning infrastructure of the digital transformations that all parts of the economy and organisations both public and private are undergoing. It is an ever changing and developing sector requiring skills and expertise that crosscut with all aspects of data, digital and technology.

Organisations

Companies with websites containing the following keywords:



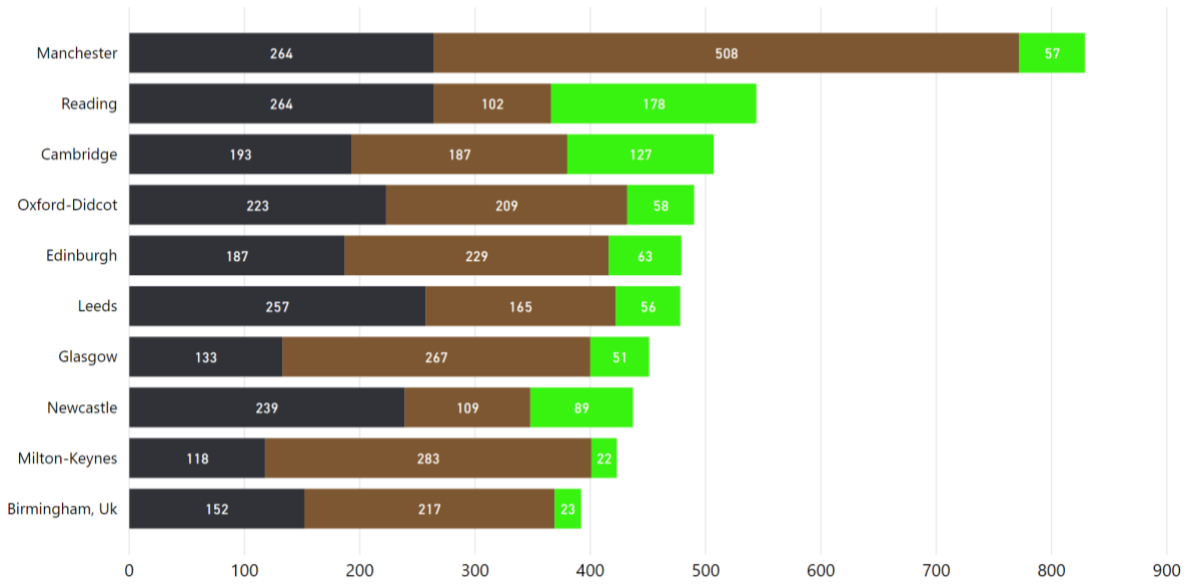
- **13 Manchester is currently the top city ranked by the number of organisations which contain websites containing keywords related to Cyber.**
- **Reading (830) is the top ranked city in the number of organisations classified as Cyber, Manchester sits in a close second (747).**

¹³ When considering The Data City's keyword data asset, using the keywords: Crypto, Cryptocurrencies, Cyber and Cyber Security.

Research

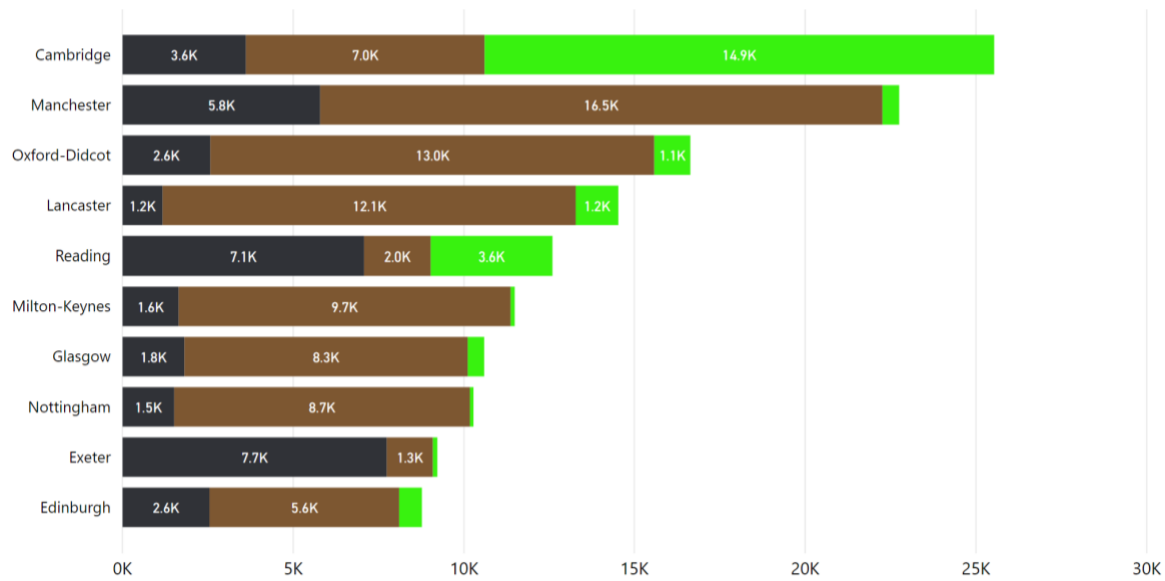
Papers published and patents filed by city:

Field of study ● cloud computing ● information technology ● server



Citations to papers published by institutions:

Field of study ● cloud computing ● information technology ● server



- **14 Manchester is ranked first in the number of papers published by city related to Cyber (Security).**
- **15 Cambridge is ranked first in the number of citations to papers published and patents filed in Cyber.**

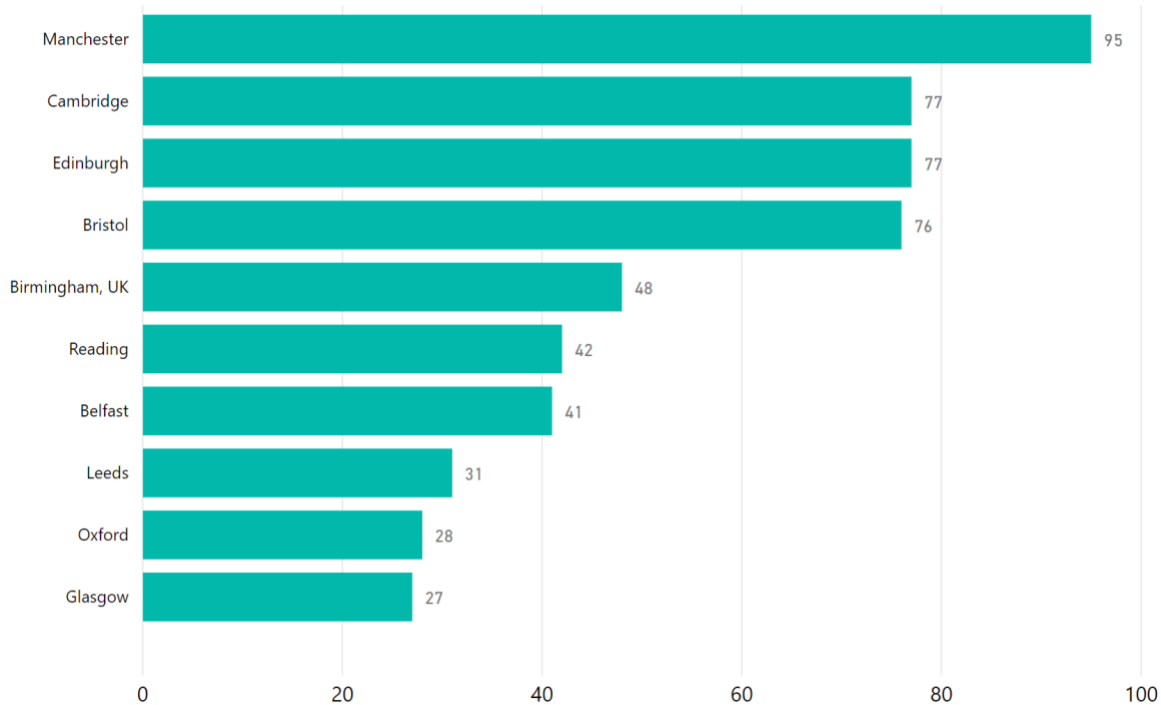
14 By exploring the data further and identifying Manchester’s strengths in The Data City’s keyword data visualisation. The keywords used in this instance are cloud computing, information technology and server.

15 When exploring The Data City’s keyword data visualisation.

- ¹⁶Reading is ranked joint first with Manchester in the [UK ranking for cloud computing \(papers\)](#), a key aspect of Cyber technology.

Events

Event descriptions containing 'cyber' in the last 18 months



- ¹⁷Manchester is ranked first using the keyword 'Cyber' where it hosted 95 events over the last 18 months. This is 18 more than joint second place Cambridge (77) and Edinburgh (77).
- ¹⁸Manchester [hosts the highest volume of classified events](#) in Cyber (29). In comparison to other cities, Manchester has hosted double the likes of Glasgow (14) and Birmingham (14). These events have been collected from *Eventbrite* and *Meetup* since January 2018.

¹⁶ When using The Data City's innovation explorer, outside of London.

¹⁷ Using The Data City's keyword data visualisation which have explored keywords within event descriptions which contain the word 'Cyber'.

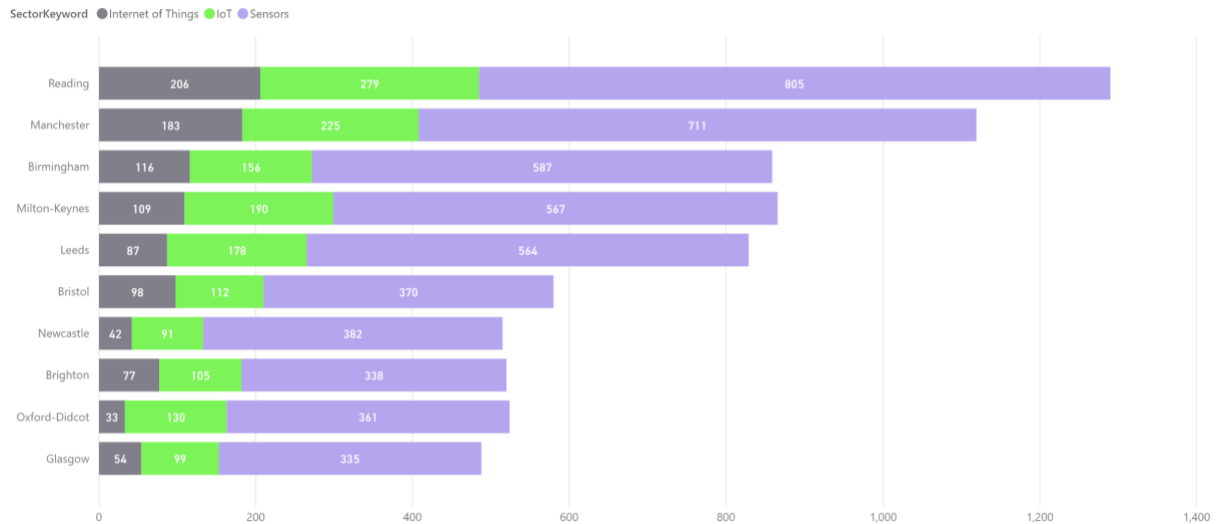
¹⁸ Using The Data City's events explorer, comparing Cyber events to other cities in the UK.

Internet of Things

The rapid growth of internet enabled, sensors, actuators and control services - The Internet of Things (IoT), is transforming the way we interact with our homes, the built environment and infrastructure.

Organisations

Companies with websites containing the following keywords:



- **19** Reading is the top ranked city in the number of organisations (~1300), which contain keywords related to IoT.
- **20** Reading is the top ranked city (83) in the number of organisations which have been classified as IoT. Manchester is second (58).

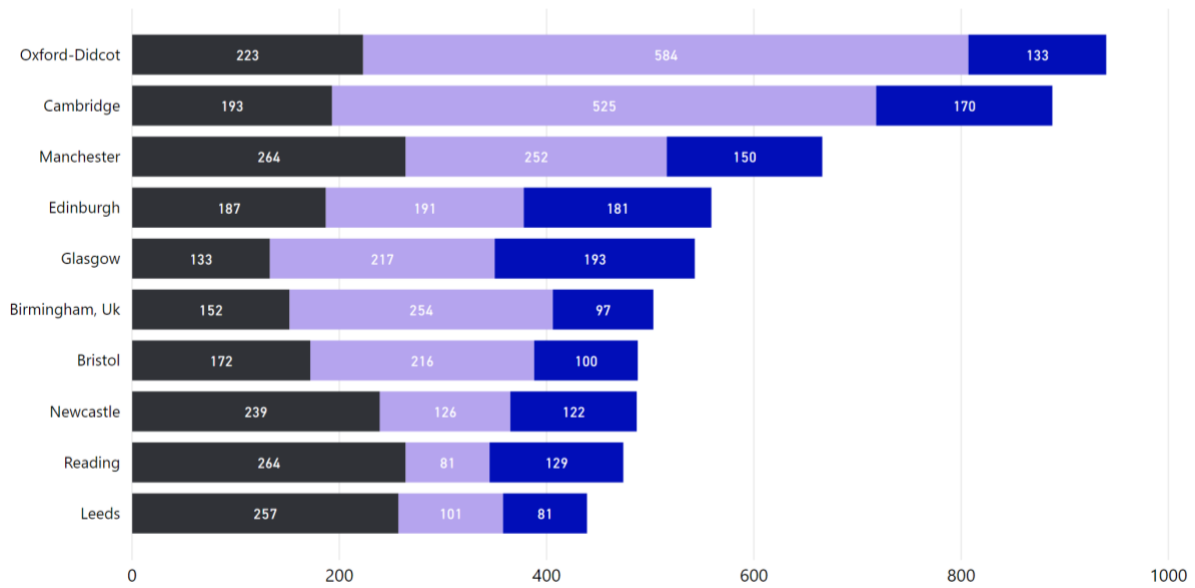
¹⁹ When considering The Data City's keyword data asset using keywords: Internet of Things, IoT and Sensors.

²⁰ Outside of London.

Research

Papers published and patents filed by city:

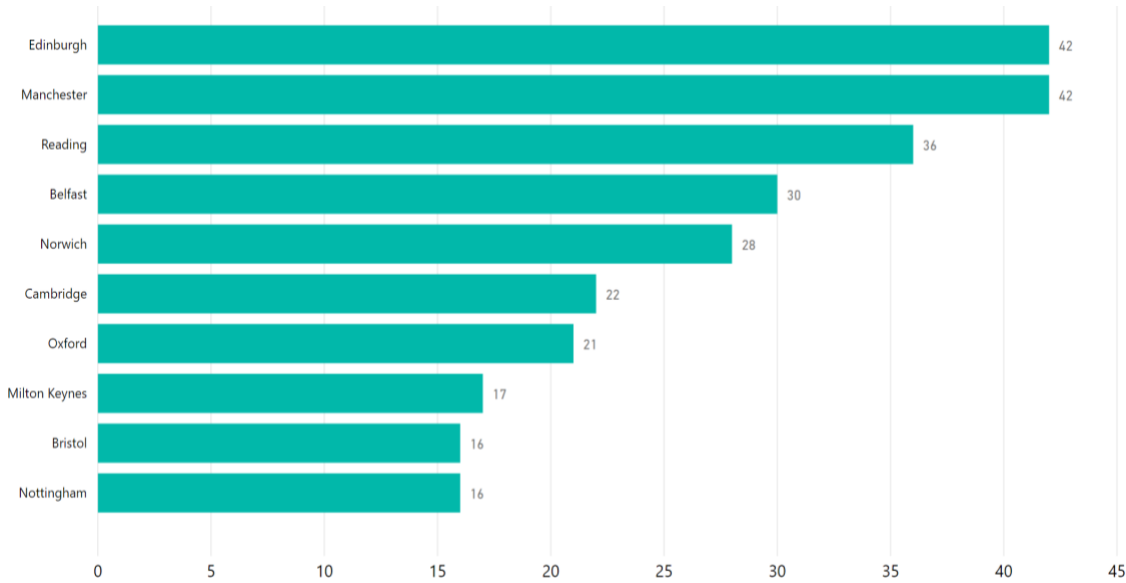
Field of study ● cloud computing ● sensory system ● wireless sensor network



- **When analysing keywords, Oxford is the top ranked city which has papers published in cloud computing, sensory systems and wireless sensor networks.**
- [When analysing the quantity of papers published by city, Oxford is the top ranked city where it has produced 584 papers in sensory systems, a key aspect of IoT.](#)

Events

Event descriptions containing 'internet of things' in the last 18 months



- ²¹When searching for events descriptions which contain the keywords 'internet of things' we can see Edinburgh is the joint top ranked city with Manchester (42 events).
- ²²[Edinburgh hosts the highest volume of classified events \(48\) in IoT.](#) In comparison to other cities, Manchester hosts the second highest volume of events (37) and Cambridge is a close third (36). These events have been collected from *Eventbrite* and *Meetup* since January 2018.

²¹ Using The Data City's keyword data visualisations

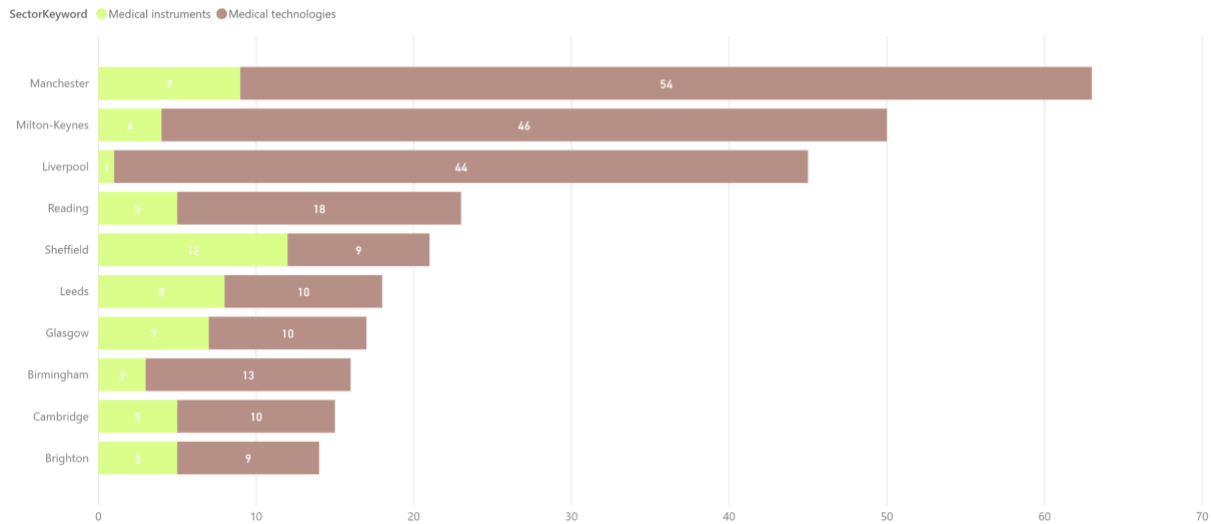
²² Outside of London, using The Data City's events explorer, comparing IoT events to other cities in the UK.

MedTech

MedTech and medical device technology is another rapidly emerging and developing sector being disrupted by the application of consumer technology, data and digital services to the domains of health and social care.

Organisations

Companies with websites containing the following keywords:



- ²³ Manchester ranks first in the number of organisations websites which contain keywords relating to MedTech. Manchester has just over 60 organisations linked to MedTech which is substantial compared to the likes of Reading and Leeds, 23 and 18 respectively.
- ²⁴ Oxford is the joint top city with the number of organisations that have been classified as MedTech (Manchester is the other joint top city with 20).

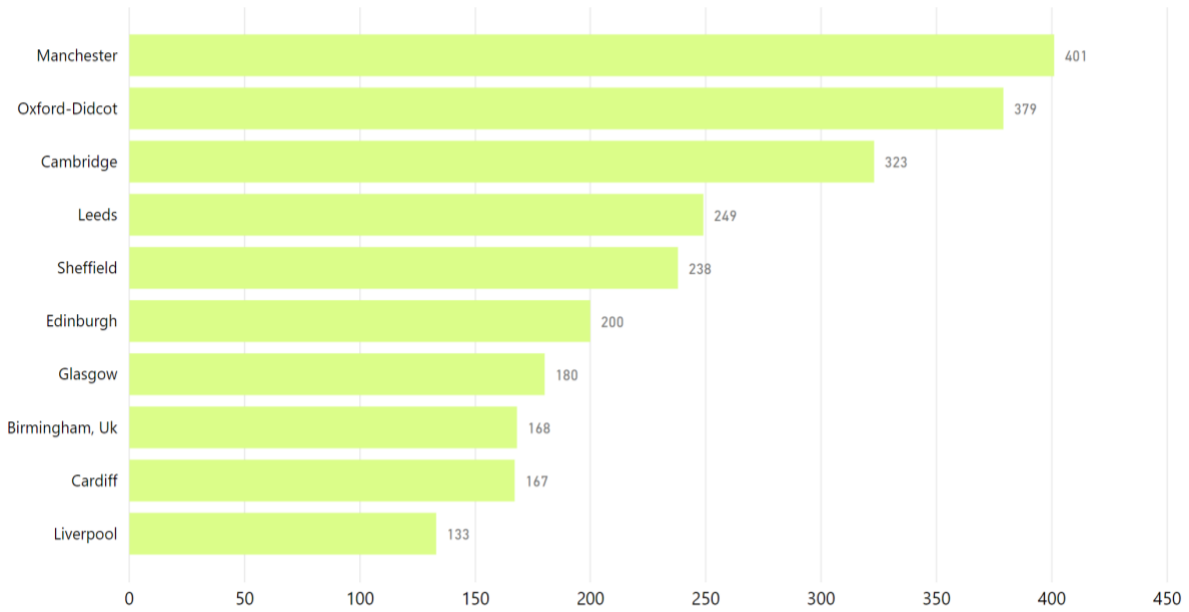
²³ Outside of London, using keywords: Medical instruments and Medical Technologies.

²⁴ Using The Data City's machine learning classification of organisations, outside of London.

Research

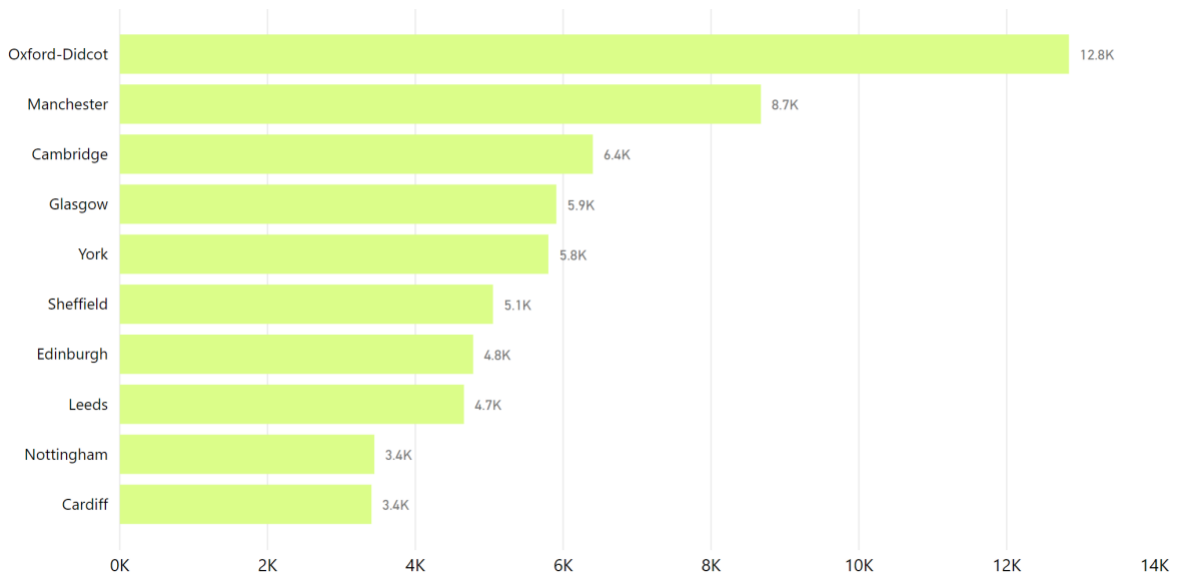
Papers published and patents filed by city:

Field of study ● medical physics



Citations to papers published by institutions:

Field of study ● medical physics

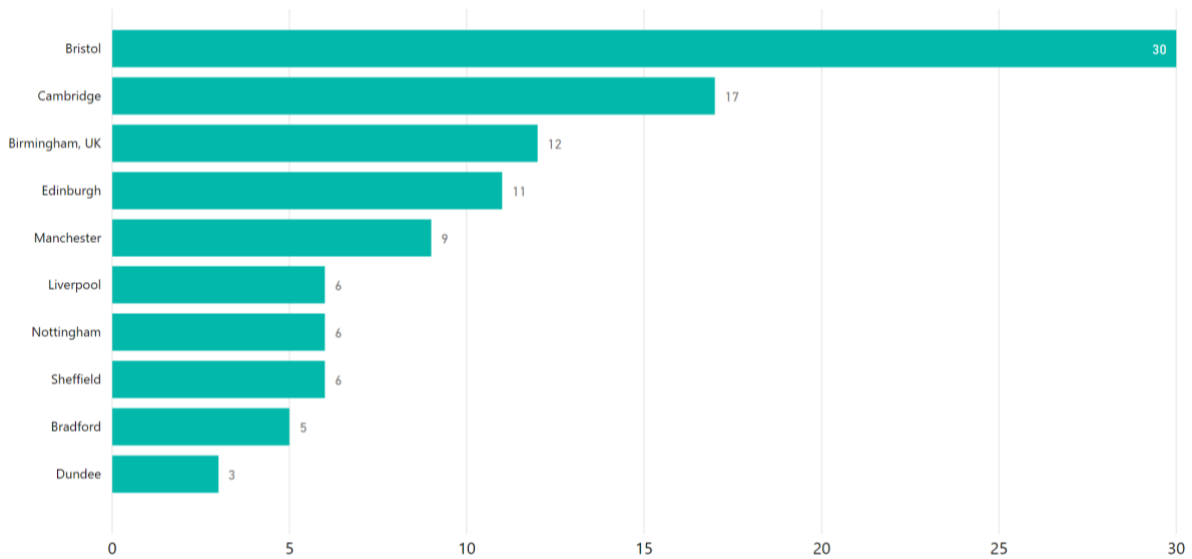


- **Manchester has released 401 different papers and patents related to this field which makes Manchester the top ranked city²⁵. Oxford (379) and Cambridge (323) follow in a close second and third.**
- **Oxford has been cited 12,800 times in the field of medical physics making it the top ranked city in the UK.**

²⁵ Outside of London.

Events

Event descriptions containing 'MedTech' in the last 18 months



- **Bristol is the top ranked city hosting events with descriptions where 'MedTech' is mentioned (30). Cambridge (17) and Birmingham (12, [where MedTech expo 2020 is being held](#)) are a few examples of UK cities hosting a significant amount of MedTech events.**
- ²⁶**Manchester hosts the [highest volume of classified events](#) (16) in MedTech. In comparison to other cities, Cambridge hosts the second most (8). These events have been collected from *Eventbrite* and *Meetup* since January 2018.**

²⁶ Using The Data City's events explorer, comparing MedTech events to other cities in the UK, outside of London.

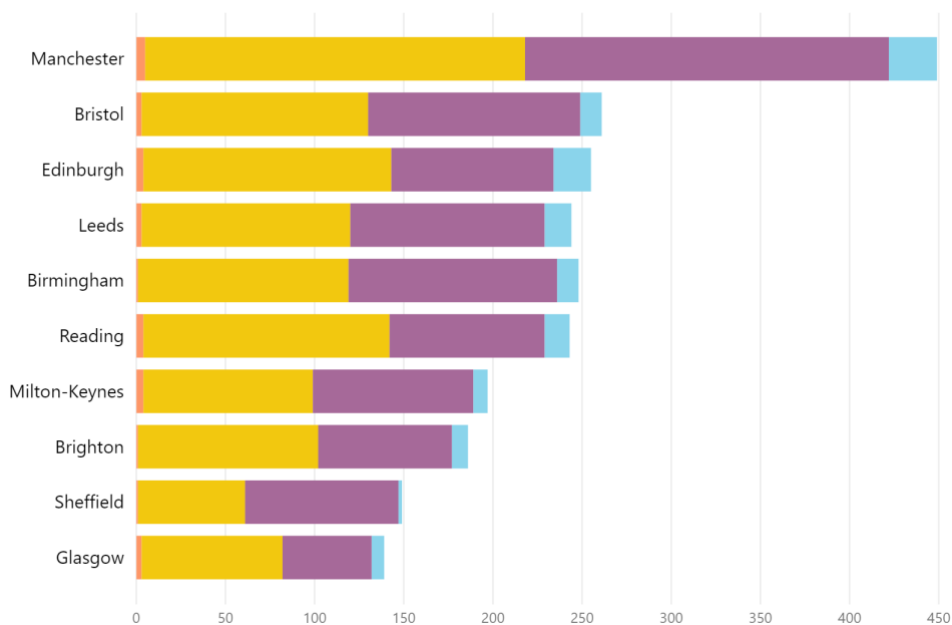
FinTech

Fintech is the collaboration between the financial and technology industry, it is used to describe new tech that seeks to improve the delivery of financial services. It is used to help companies, businesses and consumers better manage their finances by using software and modern technology.

Organisations

Companies with websites containing the following keywords:

SectorKeyword ● Challenger Bank ● Fintech ● Online Payments ● Open Banking



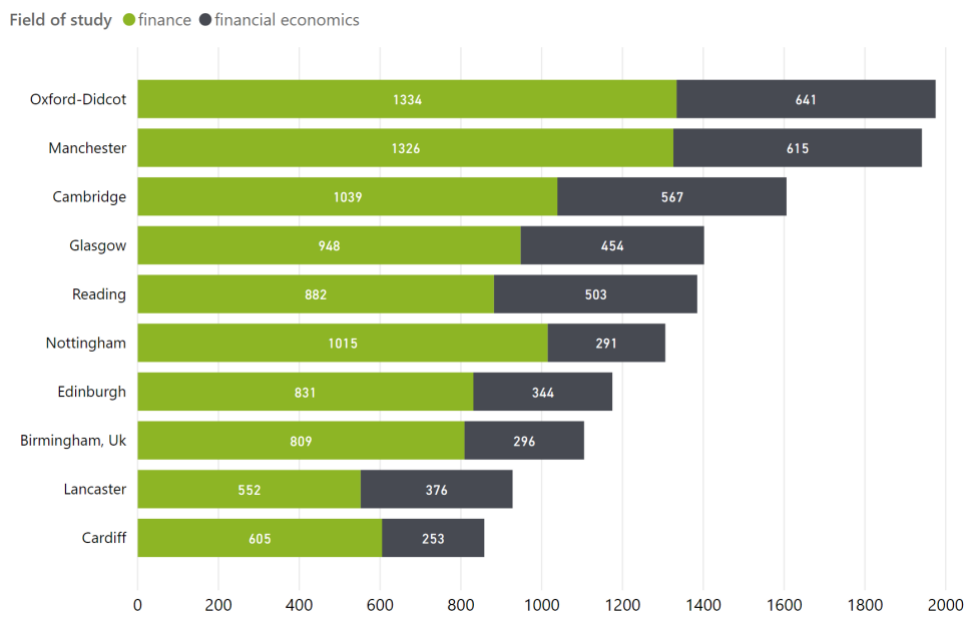
- ²⁷Manchester ranks first in the number of organisations websites which contain keywords relating to Fintech. Manchester has around 450 organisations linked to Fintech which is substantial compared to the likes of second place Bristol and third place Edinburgh, ~260 and ~255 respectively.
- ²⁸[Manchester is the top ranked city](#) with the number of organisations that have been classified as Fintech (202). Reading is the second top ranked city with 161 organisations.

²⁷ Outside of London, using keywords: Challenger Bank, Fintech, Online Payments and Open Banking.

²⁸ Using The Data City's machine learning classification of organisations, outside of London.

Research

Papers published and patents filed by city:

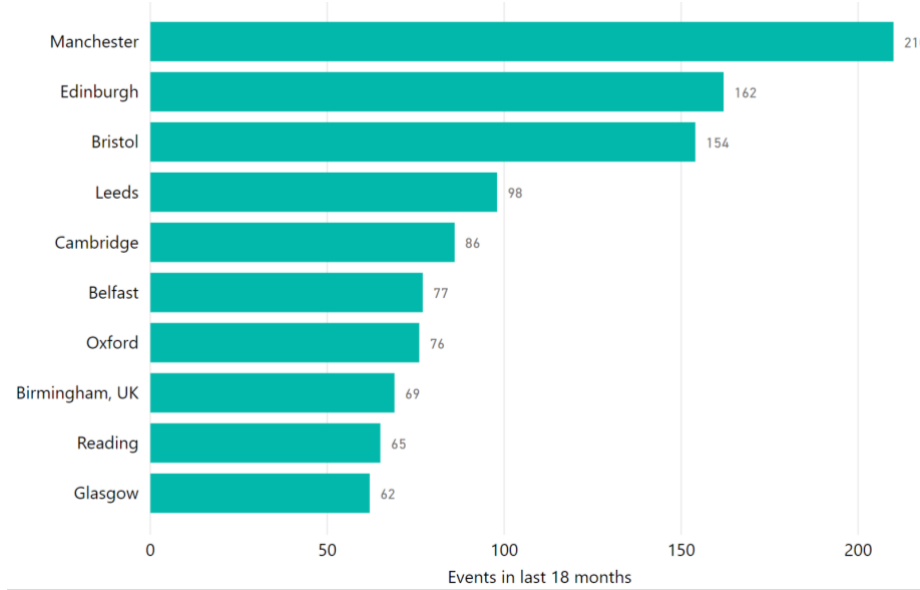


- ²⁹**Oxford has released 1975 different papers and patents related to this field which makes Oxford the top ranked city. Manchester (1941) and Cambridge (1606) follow in a close second and third.**

²⁹ Outside of London.

Events

Event descriptions containing 'FinTech' in the last 18 months



- ³⁰ Manchester is the top ranked city hosting events with descriptions where 'Fintech is mentioned (210). Edinburgh is ranked second (162) and Bristol is ranked third (154).
- ³¹ Manchester hosts the [highest volume of classified events](#) (256) in Fintech. In comparison to other cities, Bristol hosts the second most (250). These events have been collected from *Eventbrite* and *Meetup* since January 2018.

³⁰ Outside of London.

³¹ Using The Data City's events explorer, comparing MedTech events to other cities in the UK, outside of London.



For more information please visit us at:
www.thedatacity.com