



## Future proof

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# Future proof: Digital technologies and skills in Greater Manchester – Policy Briefing

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If Greater Manchester aims to become a top 5 digital city-region by 2025, the need for their digital and non-digital skills to meet demand for digital technologies is essential.

Our research maps the existing digital technology adoption and skills needs in Greater Manchester. These include: Artificial Intelligence (AI), Big Data, Cloud Computing, 3D Printing, Internet of Things (IoT) and Robotics.

We propose three key policy recommendations to maximise the city-region's growth in the sector for advanced digital technologies.

## Summary

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- According to the Adoption of Digital Technologies and Skills (ADiTS) survey 2022, 78% of the firms in Greater Manchester have adopted at least one of the following digital technologies: AI, Big Data, Cloud Computing, 3D Printing, IoT, Robots.
- Cloud Computing is the most widespread technology (70% have adopted this technology). The other five technologies are mainly in low-use and have been adopted only by 25% of firms.
- Digital technologies are complementary: 43% of respondents adopted two or more digital technologies, with Cloud Computing and AI, and Cloud Computing and Big Data the most frequent combinations.
- The main reasons for adopting digital technologies are related to the innovation of processes (67%) followed by the expansion of product or service range (51%), and process or method upgrade (49%). Task automation was selected by 45% of firms.
- Digital technologies are demonstrated to increase a firm's productivity, but also net increase in employment, with 22% of the adopters increasing the number of employees and 41% increasing the number of skilled workers.
- High cost and lack of access to people with the relevant skills are significant barriers to adopting digital technologies (31%).
- Skills related to problem-solving in a digital environment, as well as numeracy, literacy, IT, reading and writing are key for technology adopters, but skills requirements are technology and sector specific.

## Mapping digital technologies and skills in Greater Manchester

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Our research helps to map out digital technologies and digital skills in Greater Manchester. We provide specific insights to the [Local Skills Improvement Plan \(LSIP\) in Greater Manchester](#) as we cover key elements to understand current skills needs in relation to the adoption of digital technologies, a key element to strengthen the local economic needs and shape the skills provision following the [Skills for Jobs White Paper](#).

Three out of four firms in Greater Manchester have adopted at least one type of advanced digital technology. This adoption is mainly led by firms in the knowledge-intensive service sector (85%) reflecting the specific industrial context of the Greater Manchester city-region, made up predominantly of SMEs and where the financial and other professional services sectors have acted as the engine of jobs growth for over a decade ([BEIS, 2019](#)).

## **Our policy recommendations**

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### **Recommendation 1: Recognise SMEs in knowledge intensive industries as a ‘vanguard sector’ in the adoption of digital technologies – they are the key to the city region’s digital transformation.**

Different digital technologies are at different stages of diffusion. Cloud Computing is at a rather advanced stage and the most widespread technology (adopted by 70% of the firms). Cloud Computing can substitute costly in-house computing capabilities with outsourced IT services for less-resourced small firms ([Jin and McElheran, 2017](#)). However, the adoption of the other five advanced digital technologies appears to be relatively low overall (only in one out of four firms adopt them) suggesting an earlier stage of diffusion. Among them, Big Data and AI are the second most adopted technologies (25%). All in all, this raises the importance of bundling data and intangibles for adopters of digital technologies in Greater Manchester.

43% of the firms that adopted digital technologies reported adopting two or more digital technologies. In particular, 25% of respondents reported adopting two technologies at the same time, with the most frequent combinations being Cloud Computing and AI, and Cloud Computing and Big Data. For example, firms wanting to use AI require large datasets to train their algorithms, which can be generated and collected using Big Data practices, and processed and stored on Cloud Computing services ([OECD, 2019](#)).

### **Recommendation 2: Build Greater Manchester’s Digital Strategy around current local technology strengths, recognising the different stages of technology diffusion, and maximising complementarities between technologies.**

The main reason to adopt digital technologies is related to innovative processes, that is, to improve the quality or reliability of processes or methods (67%). Next, product innovation through the diversification of the portfolio of products and services has been selected by half of the respondents. This digital transformation is mainly led by knowledge intensive-high tech firms suggesting that while earlier industrial robot adopters were mainly large establishments in the automotive sector, Robots are now penetrating small- and medium-sized firms.

While the adoption of new technologies is expected to generate productivity gains, “how these gains take place” does not have a straightforward answer. In Greater Manchester, the impact on productivity seems to occur through the increasing in the volume of outputs (23% through volume of production, 39% number of customers, 32% product diversification and 30% type of customers), rather than reducing costs (17%) and prices (3%).

On the impact on the employment side, while there is an ongoing media debate on the [technology-employment duality](#), our results offer a rather positive scenario, where 22% of the adopters reported a positive increment in the number of employees in the firm against 11% reducing them. But the dilemma about the quality versus the quantity of workers remains. Digital technology adoption increases the skill level of workers, especially for firms adopting Robotics (91%), AI (53%), Cloud Computing (48%) and Big Data (47%). In this case, skills become a remarkably significant intangible asset for firms and, indeed, the lack of access to the required human capital and skills is one of the main barriers to adopting digital

technologies (as well as its cost): 31% of the firms reported these two barriers as significant adverse reasons for technology diffusion, in particular in the case of AI and Big Data.

**Recommendation 3: The adoption of digital technologies should follow a human-centric approach where skills play a key role in the levelling-up agenda. In order to anchor talent to the urban economy it is important to recognise differences in technology and sector specific skills requirements.**

Adopters of digital technologies tend to rate higher both digital and non-digital skills, but key differences appear for capabilities related to problem-solving (technical problems, identifying needs and technological responses, creativity, identifying competence gaps) in a digital environment, as well as practical traditional skills like numeracy, literacy, IT, reading and writing. The survey highlights that among the adopters of digital technologies, digital skills constitute a relevant key asset, as they rate them higher, on average, than traditional basic skills. In particular, different elements of safety (protecting devices, personal data and privacy, health and well-being as well as the environment) emerge as key to adopters of digital technologies. It is also worth noting that digital skills requirements are technology and sector specific. For example, safety is a key and relevant skill for Cloud Computing adopters, while digital and content creation is a key element for digital technology adopters in the knowledge intensive - high tech sector.

## How we conducted our research

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Data was collected using a bespoke survey on the Adoption of Digital Technologies and Skills (ADiTS) and represents a pioneering effort to identify the patterns of pervasiveness of six advanced digital technologies at the firm level in Greater Manchester. The ADiTS survey was implemented online by the Greater Manchester Chamber of Commerce (GMCC) from April to July 2022. It was launched on 4th April 2022 and disseminated to GMCC's network. The questionnaire was sent to nearly 2,800 local firm members and closed in mid-July achieving a total of 120 participants.

## Key academics

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