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Adoption of Robotics and Automation Technologies in UK Manufacturing: Analysing the Status Quo

Key Points

- Easy access to real-life cases and expanding knowledge on implementation practices are critical factors in driving the adoption of Robotics and Automation Technologies (RATs) in UK manufacturing.
- 49% of the non-adopters indicate that they have the resources to adopt RATs, suggesting that other factors – such as employee resistance and security concerns– could be influencing their adoption decisions.
- External pressures from competitors, government, and industry standards play a limited role in organisational decisions regarding RAT adoption.

1. General Overview

The digitalisation of the UK manufacturing sector represents a pivotal shift towards increased efficiency, competitiveness, and innovation. Robotics and automation technology (RAT) adoption is crucial for the UK manufacturing sector as it enhances productivity, leading to increased output and efficiency. Additionally, it boosts global competitiveness by ensuring higher quality and consistency in production and helps address labour shortages by supplementing the workforce with advanced technological capabilities. It also enhances worker safety by reducing exposure to hazardous tasks and environments, leading to fewer workplace accidents. In this report, we investigate the current state of digital technology adoption within the manufacturing industry, leveraging insights from a comprehensive survey of 588 participants from the UK manufacturing sector in 2023. The findings presented in this report aim to equip stakeholders with valuable insights and practical recommendations, fostering more effective and widespread implementation of digital technologies in the UK manufacturing sector.

2. Technology Adoption

The respondents come from companies of different sizes, locations and industries offering a holistic view of the UK manufacturing sector. 48% of the participants are from SMEs, and 52% are from large companies. The majority (82%) are based in England, with a significant proportion (26%) in the West Midlands. Regarding diverse industry sectors, 16% of participants work in the food, beverages, and tobacco sectors, 13% in the automotive sector, and 12% in the machinery, electrical, and transport sectors.

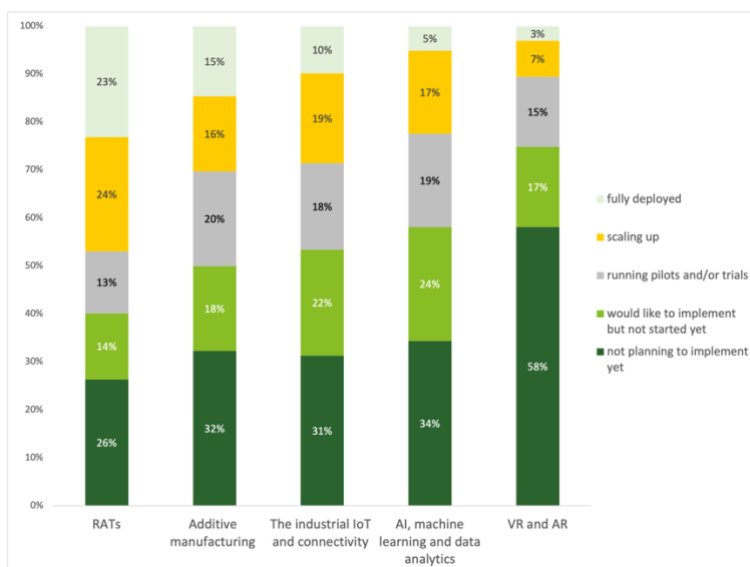


Figure 1: Adoption levels of IDTs

Participants were asked about their adoption level of five types of technologies, which were identified in the [Made Smarter Review \(2017\)](#). Figure 1 shows participants' adoption rates of these industrial digitalisation technologies (IDTs). While findings reflect varied levels of integration within companies, RATs lead with the highest adoption rate. Compared to other technologies, companies are more interested in RATs. Furthermore, the results show a significant proportion of companies intend to implement IDTs but have yet to take the initial steps. Gaining a deeper understanding of these organisations' specific needs and challenges is crucial for increasing adoption rates within the UK manufacturing sector.

On the other side, virtual reality and augmented reality have the lowest adoption rate. This may suggest that these technologies are either still in the experimental stage for many companies or that their practical applications still need to be fully realised in manufacturing.

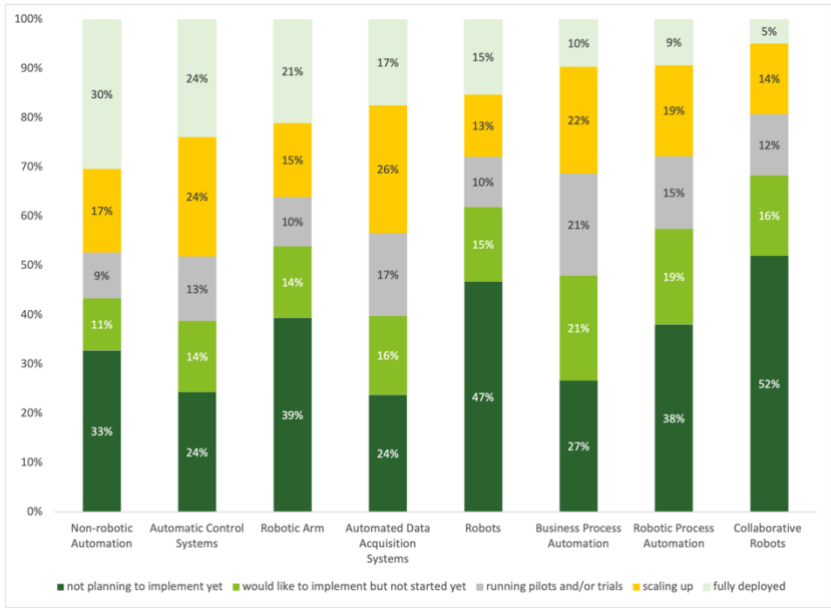


Figure 2: Adoption levels of RATs

After understanding the RAT adoption level in the UK manufacturing sector, participants were also asked about their organisation's adoption level of the most used RATs (Figure 2). Non-robotic automation, such as CNC machines, has the highest level of adoption. This might be due to the maturity, relatively lower cost and simpler implementation of this technology. Physical robots, including robotic arms and collaborative robots, exhibit the highest proportion of participants reporting no plans for implementation. The high costs and complexity of robots, as well as safety concerns around co-bots, might be preventing companies from adopting them.

3. SMEs vs Large Companies

This section presents the survey's findings based on different company sizes. It provides insight into companies' digitalisation levels and views on technology. Large companies represent participants from companies with 250 or more employees, while SMEs represent participants employed by companies with less than 250 employees.

We observe significant differences in Figure 1 when we compare SMEs with large companies. As Figure 3 shows, large companies have notably made more progress than SMEs, with less than 40% of SMEs running pilots, scaling up or fully deploying any IDTs. There is also a lot of variation across manufacturing subsectors (see Figure 6), further demonstrating the fact that different approaches might be needed to increase the adoption of IDTs in manufacturing depending not only on the company's size but also the product they manufacture and other company characteristics.

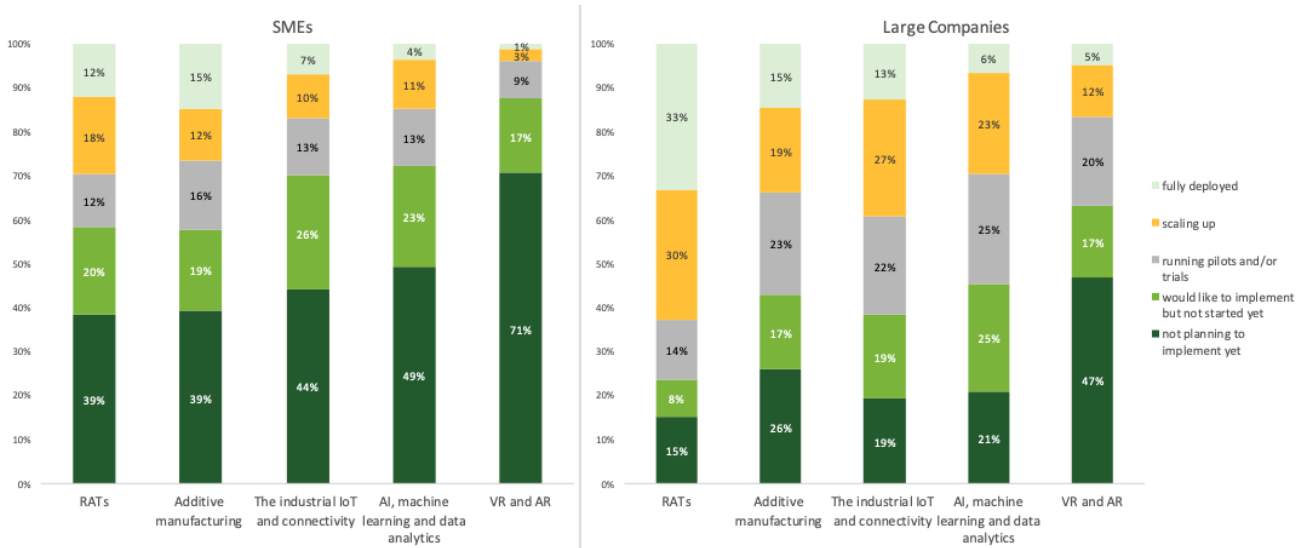


Figure 3: Adoption level of IDTs according to company size

Digitalisation Levels: When asked how they perceive themselves in terms of digitalisation level, on a scale of 1 to 7 (fully digital), large companies (4.76) see themselves as more digital than SMEs (4.21).

External requirements and influence: 17% of large companies believe that the UK Government requires their organisation to adopt RATs, whereas this figure is 11% for SMEs. 49% of large companies believe that the Government's RAT promotion has a low effect on their adoption decision, whereas this figure is 69% for SMEs. 19% of large companies believe that the industry association(s) requires their organisation to use RATs, compared to 17% for SMEs.

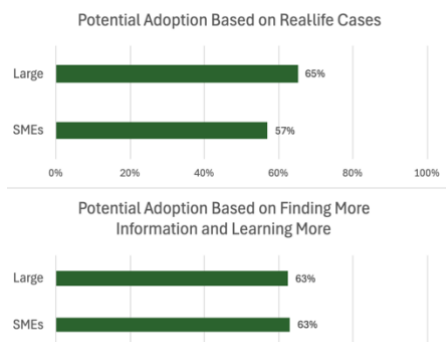


Figure 4: Large companies and SMEs divided by their agreement to the importance of collecting information and learning more about RAT, and to find and observe adoption real-life cases before adoption.

Information Gathering and Future Adoption: Both large companies (63%) and SMEs (63%) agree with the need to find more information and learn more about RAT to implement more automation. Large companies (65%) are also more inclined to adopt RAT if they can find and observe more real-life cases than SMEs (57%) (Figure 4).

Employee Learning: Most of both large companies (74%) and SMEs (71%) view employee learning as an investment rather than an expense. This perspective promotes a learning environment that is needed to upskill employees for a successful new technology implementation.

Financial Resources for RAT Development and Adoption: 77% of large companies agree that their organisation has a sufficient budget for RAT development, compared to 47% of SMEs. Additionally, 84% of large companies believe they have the financial resources to adopt RATs, while this figure drops to 56% for SMEs. This disparity suggests that smaller firms may face greater financial barriers to developing and implementing advanced technologies. This potentially slows the overall rate of RAT adoption in SMEs relative to larger organisations.

4. Technology Adopters vs Non-adopters

This section compares the survey findings based on the companies' RAT adoption level from the perspective of their employees. Adopters represent participants from companies that have adopted RAT, while non-adopters represent employees from companies that have not adopted it.

External Requirements and Influence: 51% of adopters and 63% of non-adopters disagree that the UK government requires them to adopt RATs. 52% of adopters believe that the Government's RAT promotion has a low effect on their adoption decision. This figure is 68% for non-adopters. 21% of adopters agree that industry association(s) require their organisation to use RATs, compared to 14% for non-adopters. These figures show that for both groups, the perceived impact of external requirements from Government and industry associations is not very high.

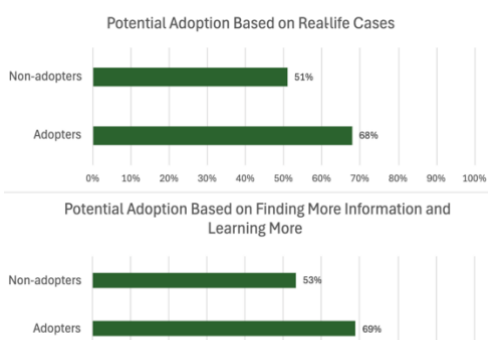


Figure 5: Companies divided by their agreement on the importance of collecting information and learning more about RAT, and to find and observe adoption real-life cases before adoption.

Information Gathering and Future Adoption: Participants were asked to rate their level of agreement on important aspects concerning the future adoption of RAT. A high portion (69%) of adopters agreed that they would adopt more RATs if they could find additional information and learn more about it. Whereas this figure was 53% for non-adopters. Similarly, adopters (68%) are more inclined to adopt RATs if they can find and observe more real-life cases than non-adopters (51%) (detailed in Figure 5).

Financial Resources for RAT Development and Adoption: 77% of adopters agree that their organisation has enough final resources to develop RATs. This figure is much lower for non-adopters (42%). 85% of adopter companies agree that their organisation has the financial resources to adopt RATs. 49% of non-adopter companies agree with this statement.

In conclusion, regardless of their current adoption level, both groups are inclined to increase the use of RATs if provided with more real-life cases and comprehensive information about the technologies. However, despite this intent, companies that haven't adopted them face financial constraints which restrain their ability to implement RATs. Moreover, findings suggest that both adopters and non-adopters perceive limited external pressure from the government and industry associations in their decisions to adopt RATs.

5. Final Considerations and Recommendations

- 61% of all participants indicated that they would implement more RAT if they could see more real-life examples. Therefore, easy access to real-life cases is key to increasing RAT adoption in UK manufacturing. Creating platforms and organising networking events might be helpful ways to increase information sharing within the sector. Sharing successful use cases might encourage companies to adopt more RATs. This collective knowledge of best practices enables informed decision-making and mitigates risks during implementation.
- Even among non-adopters, there is interest in learning more about RATs. Thus, it is important to promote information sharing, facilitate information sharing and showcase real-life successful cases of RAT adoption to reduce scepticism and promote learning.

- Although many non-adopters have the necessary resources to adopt RATs, internal barriers such as employee resistance and concerns over data security may create hesitation. These factors may outweigh financial readiness, as organisations prioritise safeguarding sensitive information and ensuring workforce acceptance before implementing new technologies.
- Regardless of their current adoption status, both adopters and non-adopters are likely to increase their use of RATs if offered more real-world examples and detailed information about the technologies. However, non-adopting companies face financial limitations that hinder their ability to implement RATs despite their interest.

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This report will be followed up by the “Adoption of Robotics and Automation Technologies in UK Manufacturing: Benefits and Challenges” report. For further information, please refer to the second report.

Appendix:

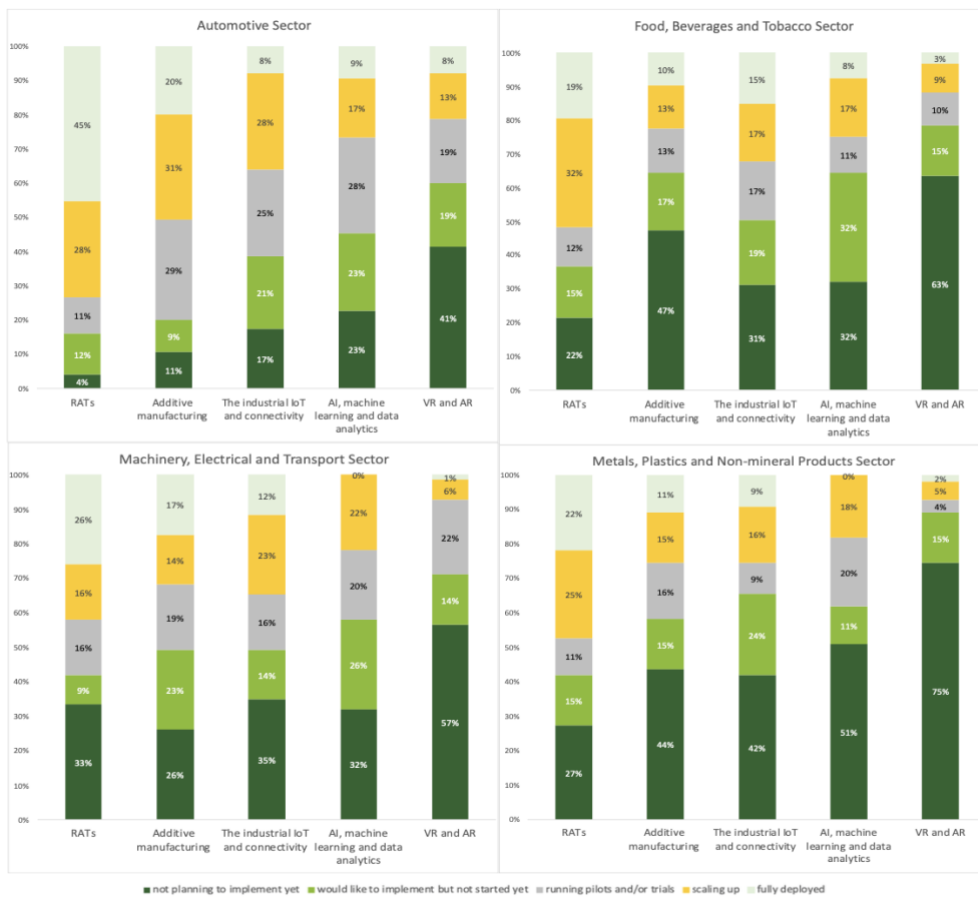


Figure 6: IDT adoption based on manufacturing subsectors