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2020 predictions for UK Technology, Media and Telecommunications

Foreword

As a new decade approaches, the impact of the technology, media and telecommunications sectors on society, business, and consumers' daily lives remains as broad as ever.

The last ten years have delivered multiple, mainstream shifts, from smartphones to subscription video on demand; from cloud computing to biometric authentication; from near-perpetual connectivity to ever broader, deeper data trails. The next ten years are likely to be equally disruptive, with some of the most significant technology advances in our lifetimes having their foundations in 2020.

The next release of the 5G standard has the potential to reinvent enterprise communications, particularly in industrial environments. The last few decades have been about connecting people. The next tranche of 5G standard should enable every machine and every tool to become connected, generating more data, enabling more insights and delivering higher productivity. We forecast 100 companies around the world will have deployed 5G by end 2020; by the end of the decade, 5G could be enabling hundreds of billions of pounds worth of value.

5G enables machines to become more autonomous. This includes service robots, which can be better connected through 5G, more capable due to edge computing, and operate for longer thanks to better battery technology. We forecast 2020 is the year in which half a billion service robots will be sold, generated over £13 billion in revenues.

Better batteries are also a core enabler of the reinvention of commuting, an evolution that will take many years to complete. The lithium ion battery enables bicycles to be reimagined and repurposed. Adding a 2.5 kilogram battery to a bike means it no longer needs to be optimised for weight. A bike with a battery can be reinvented as a compact multi-person vehicle, powered by pedalling, but assisted by battery power, particularly for starts, up-hills and headwinds. It can become a delivery vehicle, an urban taxi or a powered wheelchair. We predict that the proportion of commutes that include a cycle ride could double over the next three years, resulting in tens of billions more cycle rides per year.

Commutes have long been accompanied by radio, and increasingly they will be accompanied by podcasts in 2020. We predict that podcasts will be a £20 million business in the UK in 2020, but $1.1 billion (£850 million) globally.

The podcasts may be listened to on wireless earbuds, which are part of the growing smartphone multiplier market. Sales of hardware, software, content and services related to smartphones should be close to half a trillion dollars in 2020, with mobile advertising being the largest component. The value of smartphone accessories alone, at $77 billion (£60 billion) is multiples of the forecast revenues for tablets, wearables or smart speakers.

As we approach 2020, TV viewers are being spoilt with an ever-widening array of some of the best television content ever made. The surge of the subscription video on demand (SVOD) market should continue in 2020, and this will be complemented by the rise of advertising video on demand (AVOD). TV advertising is a £5 billion market in the UK; AVOD, which is a subset, will be over £500 million. By the end of 2020 there will be many more new names in SVOD, but there will also be a growing number of AVOD providers, including the recently launched Pluto.TV and Plex, as well as smartphone optimised Quibi.

The new decade beckons; the tech, media and telecoms markets are ready.

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Prediction 5

Robots on the move: Professional service robots set for double-digit growth

Deloitte predicts that almost one million robots will be sold for enterprise use in 2020, up 18 percent from 2019, generating £27 billion in revenues for the year.

There are two distinct enterprise robot markets: industrial and service. They do different tasks and cost different amounts. They have had, and will continue to have, distinct growth trajectories.

Of the almost one million enterprise robots forecast to be sold in 2020, just over half will likely be professional service robots, generating more than £13 billion in revenue. This is 30 percent up on 2019, a much steeper growth rate than for industrial robots, which are expected to account for £14 billion in 2020, a nine percent year-on-year increase.

Industrial robots will remain important for years to come but it is the professional service robot market that should grow fastest in the near term, catalysed by the launch of 5G and advances in artificial intelligence (AI) chips.

A well-known type of industrial robot, found in factories around the world, is the mechanical arm. The global installed base of industrial robots, which have been around since the 1970s, is significant: between 2.5 and 3.0 million industrial robots were operational in 2019. By 2021, this global installed base is likely to be 93 percent larger than in 2016, but still a small fraction of the human workforce. Once installed, industrial robots last a long time: A decade of useful life (80,000–100,000 hours of work) is common.[82]

The biggest users of industrial robots are in manufacturing, principally for automotive and electrical or electronics goods. Robots on assembly lines build cars; in the electrical/electronics industry robots place chips on circuit boards. In 2018, these two industries represented 60 percent of all global demand for industrial robots, with 120,000 units for automotive and 110,000 for electrical/electronics.

The market for professional service robots has only taken off in the last decade. These robots are mainly used outside of manufacturing and vary significantly in form, purpose and application area. The majority are designed to automate time-consuming, repetitive, or dangerous tasks.[83] Most are mobile or semi-mobile and wheeled. For example, for a medical technology company in Denmark, used mobile robots for internal goods transport within its premises. This saved employees an average 7.5 kilometres a day in walking goods on a cart between departments.[84]

Thus far, professional service robots have been most popular in the logistics (warehouse or fulfillment), retail, hospitality, and health care industries.[85] Just under half (49 percent) of the roughly 360,000 professional service robots sold to enterprises in 2019 went to logistics companies. Second and third place go to inspection and defence, which accounted for another 33 percent and 4 percent, respectively, of 2019's professional service robot unit sales.

What exactly is a robot? Shifting categories and blurring lines

As time goes on, the distinction between various types of robots—industrial and service, enterprise and consumer—is becoming less clear. Is an automated dolly that carries partially built automobiles from place to place in a smart factory a professional service robot or an industrial robot? Even the definition of what we consider to be a robot is in flux, as companies start to put more advanced capabilities into new form factors such as speakers.

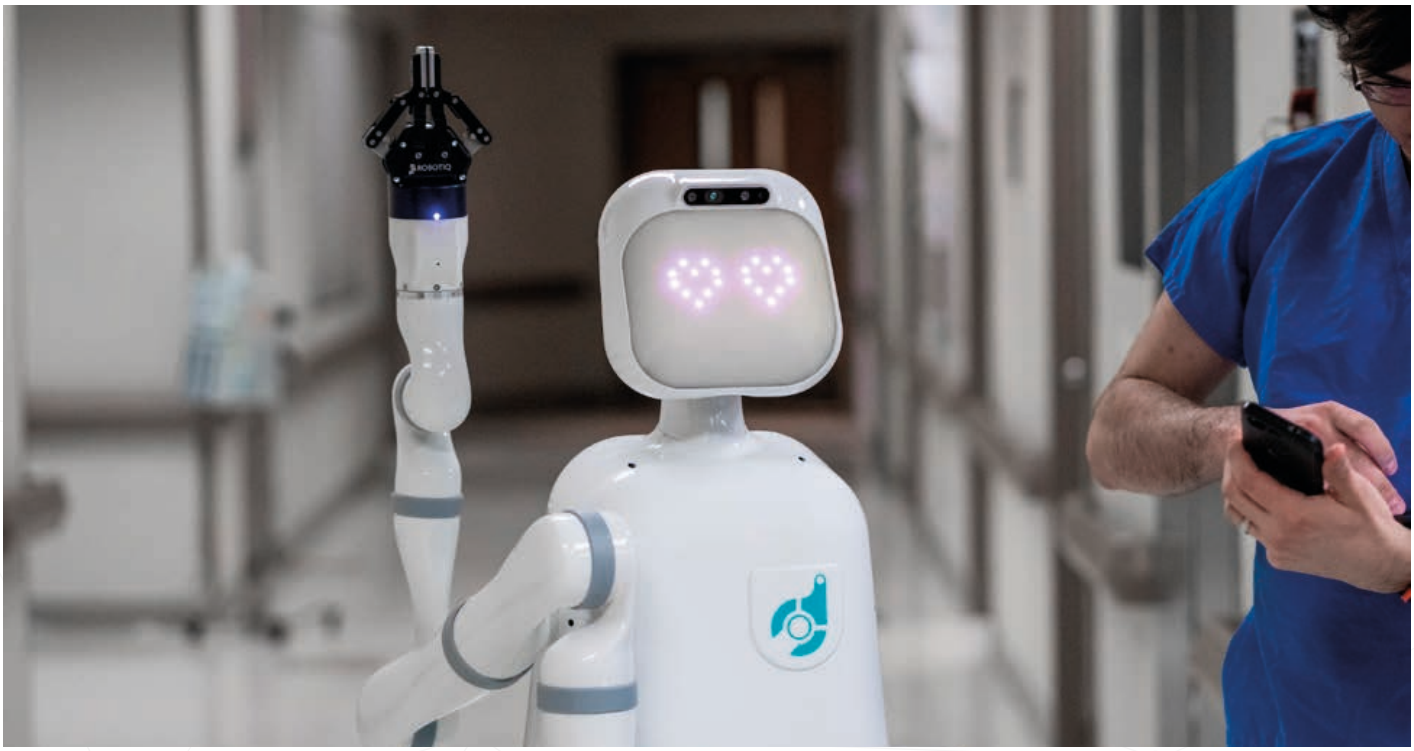
The US is suffering from a nursing shortage that is likely to get even worse in the near future, as more than a million retire by 2030 and the population ages.[86] Several Texas hospitals are turning to robots to fill the gap. But instead of automating nursing tasks such as taking vitals or changing bedpans, the robots instead augment existing nursing staff by performing non-patient-facing work.

Meet Moxi (figure 1), a mobile service robot with a light-duty industrial arm manufactured by a Texas company called Diligent.[87] Connected to the hospital network and patients' electronic health records, Moxi executes simple tasks such as dropping off specimens or placing an admission bucket—fresh supplies for a new patient—in cleaned rooms ready to receive patients.

These are not particularly difficult tasks, but for overworked nurses who have patients to care for, not having to do them can make all the difference.

But Moxi doesn't just slink from room to room executing menial tasks. It also has, perhaps surprisingly, a social element, with nurses greeting it, patients taking selfies with it, and children writing to the robot's creators asking where it lived.[88] The robot wanders around the hospitals once per hour, flashing hearts (where its eyes are) at passersby.

Figure 1. Moxi is challenging old ideas about what robots are



Still more confounding is the prototype of Alice (figure 2), a robot originally designed to alleviate loneliness in the elderly and now being explored to help those with dementia as well.[89] Without arms and without wheels, Alice can have a conversation, move her head, and show simple facial expressions. One can imagine Alice 2.0 having wheels, or even arms, for simple tasks such as fetching things or helping with feeding. But even in her current configuration, she is forcing us to broaden our definitions of what a robot is.

Figure 2. Alice can help alleviate loneliness among the elderly and those with dementia

It's convenient today to categorise robots by their primary use: industrial, service, entertainment. But robots like Moxi and Alice show that such categories are by no means carved in stone. Perhaps the broader lesson is that it's not what one calls a machine that's important—it's what the machine can do.

The professional service robots' growth in 2020 and in the medium term should be driven by the launch of 5G, and the falling prices and rising power of edge AI chips. The combination of 5G and edge AI chips can solve many challenges that limit professional service robots' practicality today.

Connectivity is one such challenge. Maintaining reliable connectivity for professional service robots, which usually need to be moving around factories or warehouses, has historically been very challenging, principally because of metallic obstructions from shelving, conveyor belts and indoor vehicles. The next release of 5G, Release 16, which is being finalised in June 2020, should address these challenges.

5G Release 16 is designed to offer a 99.9999 percent reliability rate, which means an expected downtime of just 5 minutes per year – which in a manufacturing environment is critical.[90] Network slicing, which allocates network performance to different tasks based on their priority, can further enhance reliability for top-priority tasks (for more information, see the Prediction "Industrial 5G: Enterprise untethered"). Latency can be one millisecond, for applications that require this.

Edge AI chips can perform processor-intensive AI tasks on the actual robot, rather than via cloud-based processing.

Advances in chip design also mean better performance and power consumption. Chips designed specifically for AI computations draw much less power, and fewer are needed for a given amount of processing than the traditional chips such as graphics processing units (GPUs).

In addition to the robots used by enterprises, there are two large and growing consumer robot markets. Consumer service robots, designed for tasks such as vacuuming, mowing the lawn, and washing windows, sold 17.6 million units in 2019, up 44 percent from 2018. And entertainment robots—mainly toys made in Asia, some of which are fairly sophisticated—sold 4.5 million units in 2019, 10 percent more than in 2018. Although 97 percent of all of the robots sold each year are consumer robots, they are responsible for just one out of every seven dollars of robotics industry revenue.

Robots in the UK

Robots have been less enthusiastically adopted in the UK. The country ranked 22nd in terms of robot density, with 85 machines per 10,000 employees in the manufacturing industry. This is significantly lower than the European average of 106.[91] In 2015, there were just 10 robots for every million hours worked, significantly lower than Japan with 167.[92] New installations of industrial robots fell 3 percent in 2018 to 2,306 units. This followed 31 percent growth in 2017.[93] About half of all robots are used in car manufacturing, with the food industry only now starting to use robots in their processing.[94]

There are two main reasons for the lower adoption rates. First, the UK's economy is manufacturing-light, but services-strong. Manufacturing is 9 percent of GDP, and services is approximately 70 percent.[95] The use case for robots in a manufacturing-light market such as the UK is weaker than in other European markets, such as Germany where manufacturing generates 21 percent of GDP.[96]

Secondly, the UK has benefited from access to affordable labour, predominantly from Eastern Europe. Many businesses may have opted to use reasonably priced labour rather than to invest heavily in robots. However, recent political developments have had and are likely to continue to have an impact on workforce availability predominantly in the agriculture and logistics industries. This may result in significant shortages for jobs such as seasonal fruit pickers,[97] or warehouse workers. Robots could provide a viable solution to these sectors.[98]

Britain's current low robot density levels, makes it ripe for investment and could provide an answer to its productivity issues. According to the Office for National Statistics, there are 1.5 million jobs at high risk of having some tasks automated,[99] making this market a fertile soil for robots adoption, but also development. British start-ups currently account for 6 percent of the global robotics market.[100] The government has recently, as of October 2019, launched "the UK's biggest research programme" dedicated to designing safe and trustworthy autonomous systems which can care for the elderly.[101]

Bottom line

What will be challenging is for companies to assess if and when professional service robots are the right tool for the job. Their price, power, and flexibility—driven by advances in 5G and in edge AI chips – will be very different in 2025 than in 2020. Increasingly, robots are no longer just about making goods better, cheaper, or faster. A new generation of more capable and flexible robots will increasingly impact decisions about where to manufacture goods, which goods to manufacture, and how to cope with the challenges of scarce or high-cost labour.[102] Correctly anticipating use cases and ROI will be an important task for strategists going forward—both for those who make and sell robots, and for those who use them.

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