MAKE uk
The Manufacturers' Organisation

REINVENTING THE MANUFACTURING WORKFORCE

Rapid Process, taken by Steve Watts at Darlington Engine Plant, shortlisted in the amateur category of the EEF Photography Competition 2015.

CONTENTS

SUMMARY

With manufacturers facing some of the most turbulent years for decades, time is increasingly running out for those who aspire to prosper and grow in a rapidly changing world. Technological change in UK manufacturing has been ever present since the dawn of the industrial revolution, but while technological change has always been a driver for the makers, manufacturing stands on the cusp of a revolution. The incremental changes of the past are being eclipsed by new digital, smart and automated technology that has the potential to radically change the workplace in ways never seen before.

Hand in hand with this new technology will be the people needed to deploy it to its fullest effect. Just as technology is changing rapidly, the people using it must adapt not only to new ways of working, but also to new work.

As the UK continues the extended process of its exit from the EU and maps out its post-Brexit future, its starting point in terms of its available human capital is at best average. The UK's education system ranks below international competitors, even more so for STEM-specific qualifications. With a poor start on the skills ladder, too many UK workers miss out on vital technical skills and do not experience a world of continuous skills improvement. Furthermore, employers face high barriers to deliver training, barriers that are unheard of among the UK's global competitors.

Our report takes a critical look at the challenges manufacturers will face and what they need to do to prepare for these challenges. From poor leadership and management skills, through the digital revolution and onwards to seemingly omnipresent UK skills shortages, UK manufacturers cannot afford not to take action – now – if they are to compete with the best in the world, who will soon be snapping at their heels after the UK leaves the protective umbrella of the EU.

Our recommendations, aimed at employers, Government and business organisations in equal measure, challenge all to raise their game and accept that the UK faces a skills credit crunch. Much of the solution can only be found by working better and smarter with what we already have – our existing workforce – and making manufacturing a workplace of choice for many. New technology can usher in new ways of working and learning to help broaden the sector's appeal.

UK manufacturers have over time proved themselves to be adaptable, innovative and resilient. They have the tools and talent to make a success of the rapidly changing work they face, but those who do best will be those who reinvent their businesses, and in particular reinvent their workforces.

PART 1: THE BIG PICTURE, THE BIG CHALLENGES

Reinventing the manufacturing workforce to be fit for the future requires building agile workforces and adaptable places of work. In the current landscape, with so many external factors affecting the ability of manufacturers to do this successfully, it is challenging. We have identified three big challenges manufacturers face in the current climate to reinventing the manufacturing workforce.

1. STAGNANT PRODUCTIVITY

Productivity has flatlined since the 2008 recession
In our *Unpacking the puzzle – getting UK manufacturing productivity growth back on trend*[1] report, we found that while UK manufacturing has been a significant contributor to UK productivity, since 2008 manufacturing productivity has flatlined. Even though we are ten years on from the 2008 financial recession, productivity growth has been less than 1% a year, compared to 4.7% between 2000 and 2007.[2]

Despite operating in a healthy, buoyant labour market with low levels of unemployment, UK manufacturing productivity remains weak, both domestically and internationally. Our productivity report found that drivers of the UK's weak productivity growth include:

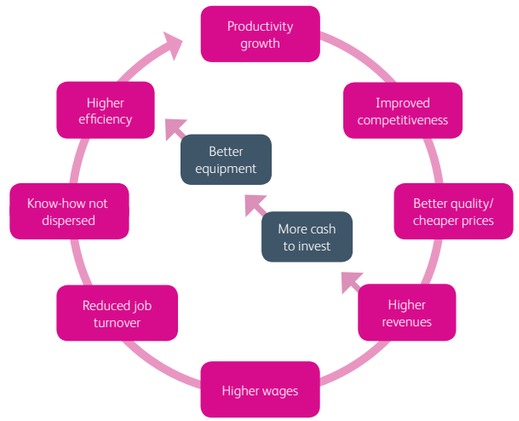
– An underinvestment in capital equipment. The manufacturing sector was the only economic sector with a contraction in capital stock between 1998 and 2016. Furthermore, investment in new machinery and equipment, which can drive efficiency, has been weak and has contributed to the productivity puzzle.
– Lower levels of leadership and management capability. A recent ONS study found "a significant correlation between management practices and labour productivity".[3] Better management practices through continuous improvement, employment practices such as promotions and rewards based on performance, and the use of KPIs and targets lead to better productivity performance. However, our research shows the that UK was outperformed in management practices by the USA, Germany and France.[4]

This matters because investing in training to raise the skills of the workforce lifts productivity; it improves the human capital of a company and enables employees to use capital and equipment more effectively, thereby boosting output. Investing in new capital and machinery often leads to a lesser reliance on lower-skilled job roles and the creation of higher-skilled roles, which attract higher wages, and reduces job turnover, allowing the business to hold on to skilled workers and therefore become more efficient and more productive.

[1] EEF, Unpacking the puzzle: Getting UK manufacturing productivity growth back on trend, 2018
[2] EEF, Unpacking the puzzle: Getting UK manufacturing productivity growth back on trend, 2018
[3] Office for National Statistics: Management practices and productivity in British production and services industries, 2018
[4] EEF, Unpacking the puzzle: Getting UK manufacturing productivity growth back on trend, 2018

To achieve this, a business needs good management and leadership to recognise the opportunities in linking people to productivity. Yet this is questionable. Take, for example, our findings that only 38% of manufacturers see offering agile ways of working as a means to improve employee productivity.[5]

Image 1: The virtuous cycle of productivity



Source: EEF, Unpacking the puzzle: Getting UK manufacturing productivity growth back on trend, 2018

2. THE ADOPTION OF DIGITAL TECHNOLOGIES AND TECHNIQUES

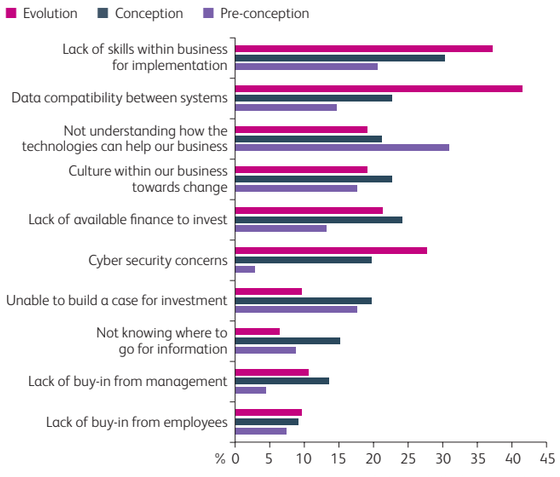
As manufacturers increase investment in 4IR technologies and techniques, they face a skills barrier

A challenge, but also an opportunity, is the Fourth Industrial Revolution (4IR). 4IR is driving organisations to think about investment in new technology and techniques in order to boost productivity, remain competitive in a changing economy and deliver greater customer value. While the use of new technology and techniques is not new to manufacturing, the pace of change is.

The benefits of 4IR technology adoption will not only help establish smarter supply chains, smarter production and smarter products, but it will also fundamentally change the way manufacturers work. As manufacturers continue to invest in new technologies, such as augmented reality, cobots, the Internet of Things (IoT) and analytics, the skillsets required and demanded by manufacturers will also change. However, as our previous work has found, this can be a challenge. Indeed, 31% of manufacturers have pointed to a lack of appropriate skills as a barrier to past and future investment in automation.[6]

Chart 1: A lack of skills remains a key barrier to adopting 4IR technologies and techniques

% of companies citing barriers they have experienced or anticipate experiencing when adopting 4IR



Source: EEF Manufacturing Outlook survey 2018 Q2

[5]EEF, Modern Manufacturing Workplaces survey, 2018
[6]EEF, Investment Monitor, 2018

Image 2: Digitalisation leads to jobs being created

DIGITALISATION LEADS TO JOBS BEING CREATED	
NEW JOBS	New digitally skilled jobs that did not previously exist are created based on the introduction of new technology and techniques. Technology has driven this job creation model for centuries.
GROWTH	Being more productive and competitive, winning additional business leads to need for more of the existing jobs to meet the increased demand.
RESHORING	Digitalisation makes it economically viable to have localised, flexible manufacturing, closer to the market with shorter lead times. Jobs are reshored to the UK from previously low labour-rate countries.
SUPPLY CHAIN	There is a multiplier effect in the supply chain - for every job created in industry, several jobs will be created in product suppliers and service providers throughout the supply chain.
SERVITISE	Digitalisation allows the servitization model, where products are sold as a service with a performance guarantee. In addition to manufacturing jobs, further service based jobs are also created.

Source: Made Smarter. Review 2017

Furthermore, a lack of skills within a business for implementation of 4IR remains a barrier at the pre-conception, conception and evolution phases.[7]

The great 'Are robots taking our jobs?' debate

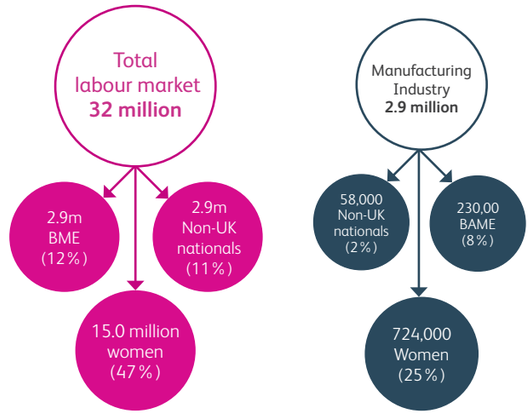
There is intense debate as to the impact investment in digital technologies and techniques will have on jobs – with a particular focus on the impact of investment in automation, AI and robotics. While some automatically assume that this will lead to net job losses overall, the World Economic Forum found strong expected growth in the architecture and engineering job family: up to 339,000 extra jobs by 2020, driven by 3D printing, resource-efficient sustainable production and robotics.[8] This is supported by the 2017 Made Smarter Review,[9] which found that technological disruption such as robotics and machine learning are less likely to completely replace existing occupations and job categories, but rather to undertake specific tasks previously carried out as part of these jobs. This frees up workers to focus on new tasks, often requiring a higher-level skillset, exacerbating the existing skills challenge. These new jobs will be created in supply chains of companies, but also in different areas, such as servitisation, as shown in image 2.

3. A SKILLS SHORTAGE

A shrinking talent pool

For many years, the numerical manufacturing workforce has been in decline. Between 1997 and 2018, the manufacturing workforce decreased from 4.3 million to 2.9 million. Moreover, the manufacturing industry tends to recruit just a small proportion of people from certain groups: those of black and minority ethnic (BME) backgrounds, women and non-UK nationals. However, as the industry continues to struggle to recruit the people it needs from the existing talent pool, any future workforce will need to include employees recruited from different sectors and demographics to accommodate the current shortfall.

Image 3: Demographics of the manufacturing workforce compared to the UK labour market



Sources: Office for National Statistics, Employment by industry, May 2018; Labour Market Statistics, Annual Population Survey, 2018

[7]EEF, How 4IR is transforming manufacturing productivity – Fact Card, 2018
[8]World Economic Forum, The Future of Jobs, 2016
[9]Department for Business, Energy & Industrial Strategy, Made Smarter. Review 2017. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/655570/20171027_MadeSmarter_FINAL_DIGITAL.pdf (accessed 6 October 2018)

There remains a mismatch between what employers want, need and demand, and what the labour market is delivering (supply)

A skills shortage, talent deficit or recruitment challenge – whatever you call it, we all know what it means. The skills gap in manufacturing is well documented not just in EEF research but also by an array of independent and Government-commissioned reviews. The skills gap tends to be across all levels, but there remains a particular shortfall of talent at Level 3 and above, which captures technician-level roles, the shortfall of which is highlighted in the Government's Industrial Strategy. And it's not just engineering that wants engineering skills – 42% of projected demand for engineering skills is expected to arise outside the engineering sector.[10] This demonstrates that these skills are needed across the economy, and competition for skills is fierce.

Looking ahead to 2024, this skills gap is set to exacerbate further

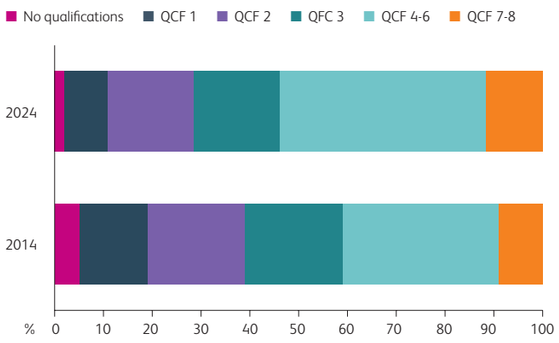
Analysis carried out by Engineering UK projects that by 2024 the labour workforce will be heavily skewed towards roles requiring qualification at Level 4 and above. This reflects our earlier evidence that many lower-level roles are likely to be automated and replaced with roles that require a higher level of skill and competence. This presents those employees with an opportunity to retrain and upskill. Upskilling and reskilling is something that manufacturers have consistently done within their workforces; our skills research points towards the training of existing members of staff. However, it is not always easy, owing to a number of barriers, including lack of suitable provision and time pressures. Some of this could be made easier through the use of digital learning platforms, such as online courses, which we explore later in this report.

The unavoidable Brexit effect is already being felt and has the potential to worsen the skills shortage

We saw an immediate effect after the EU referendum with a fall in the number of job applications manufacturers received from EU citizens and an increase in the number of EU nationals leaving manufacturing firms. This trend has continued this year, although the magnitude of the problem has decreased.[11] More than three-quarters (76%) of manufacturers currently have at least one EU national working in their business, and on average EU nationals make up 11% of a manufacturer's workforce. Any reduction in the availability of EU nationals, now or in the future, would be of concern to manufacturers, as it will only make the skills shortage worse.

Chart 2: Composition of the 2014 and 2024 UK labour workforce by qualification level

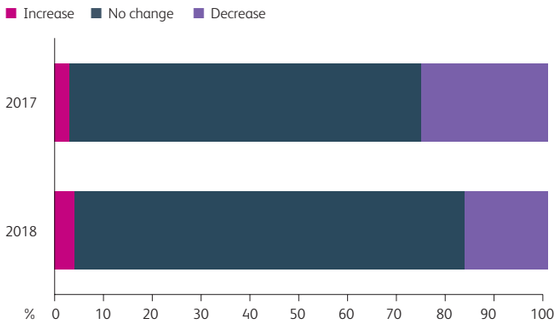
% of workforce required by qualification level



Source: Engineering UK, State of Engineering, 2018

Chart 3: The referendum had an immediate effect on the number of job applications manufacturers received from EU citizens

% of manufacturers seeing a change to the number of job applications received



Source: EEF/Squire Patton Boggs, Migration survey, 2018 and 2017

[10]Engineering UK, State of Engineering, 2018
[11]EEF/Squire Patton Boggs, Navigating Brexit: Managing the Migration Minefield, 2018

PART 2: THE ACTION – WHAT ARE COMPANIES DOING?

Reinventing the manufacturing workforce by building agile workforces and workplaces is challenging, but many manufacturers are already taking action. The type of action being taken by companies includes widening their talent pool, retraining existing employees and evolving the way they engage with employees.

1. WORKFORCE PLANNING

Not everyone has a workforce plan

Despite a greater need for companies to ensure they have the right people with the right skills to navigate the many changes and challenges that lie ahead, just one-third (32%) of manufacturers have a workforce plan in place. Almost two-thirds (64%) do not have one and 5% said they did not know.[12]

We defined a workforce plan as a plan with measurable actions that align the changing needs of the business with their people strategy.

24 months – the average length a manufacturer's workforce plan looks ahead

WHAT DOES A GOOD WORKFORCE PLAN LOOK LIKE? SIEMENS' 'SKILLS FOR THE FUTURE' PLAN

Many Siemens businesses have often tended to approach workforce planning by considering today's known challenges and extrapolating our data to try to accurately predict the nature of our future workforce. Sometimes our basic predictions come true, but frequently the detailed predictions are not as accurate as we would like them to be.

In order to improve the quality of our preparations for the future, we are trialling two approaches.

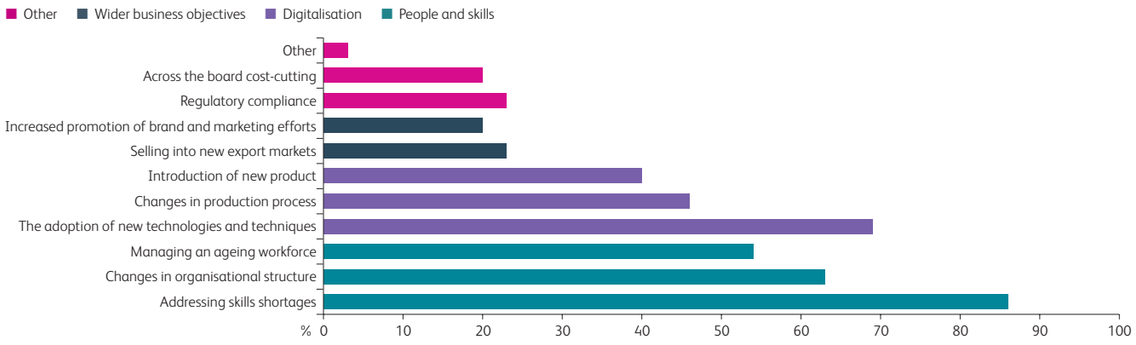
1. The first combines the use of real employee data and our strategic predictions to simulate different future business scenarios with an online tool. Combining current employee numbers and job families with estimates of turnover provides us with a prediction of the supply of workers over time. The demand for workers can also be predicted through an analysis of future requirements from the business. Any gaps identified between the future supply and demand of roles and skills are used to define activities to close them.
2. The second takes a more holistic approach where we paint a picture of where each business may be in three years' time and work backwards from there, instead of extrapolating from today. Following the presentation of our business strategy, megatrends and insights from some future-minded employees, we discuss these outputs with a diverse team to identify what we think are the most likely strategic changes we can expect in that time period. With each likely strategic change, we can start to predict how these may affect the future make-up of our workforce.

Source: Siemens, Skills for the Future, 2018

[12]EEF, Modern Manufacturing Workplaces survey, 2018

Chart 4: A range of business priorities are driving workforce plans

% companies citing factors driving changes to workforce plans



Source: Modern Manufacturing Workplaces survey, 2018

But for those that do, it is driven by the need to address their talent deficit

Given the talent deficit we set out earlier, it is unsurprising that, of those companies with a workforce plan, 86% said that addressing skills shortages is driving their company's current workforce plan. A further 52% said that managing an ageing workforce is also driving their company's current workforce plan. Succession planning is key, and again companies were not focusing just on just new entrants but also on employees already in the workplace through upskilling and retraining.

Nevertheless, it is not just people and skills, or a lack of potential skills, driving these challenges; there are other new drivers on the horizon too:

- 69% say that the adoption of new technologies and techniques is driving the priorities of their workforce plan;
- 44% say the introduction of new products is a driver;
- 23% say selling into new export markets influences their plan;
- 20% say that increased promotion of brand and market efforts is changing workforce plans.

This suggests that wider strategic business objectives are steering manufacturers to think about the changes required in the composition of their workforce now and in the future.

2. WORKFORCE ENGAGEMENT AND CHANGING THE WAY EMPLOYEES WORK

The manufacturing workplace is constantly evolving, driven by the various factors listed above. It is vital that any organisational change is communicated well to employees. This is particularly pertinent in the case of changes to job roles and workplaces in light of the adoption of 4IR. It is this requirement that has seen other EEF research uncover increased demand for leadership, people management and line management skills.[13] So how are companies engaging and communicating with employees? Are they reflective of the digital techniques that they as manufacturers are adopting?

[13]EEF, An Up-skill Battle, 2016

Manufacturers still use traditional channels to engage and communicate with employees

When it comes to engaging with and communicating organisational goals to employees, an overwhelming number of manufacturers are continuing to use more traditional forms of communication, including noticeboards, newsletters and staff meeting/briefings (90%). Only a little more than half are using electronic methods, such as email, to communicate organisational goals (52%).

This initially seems at odds with the wider narrative of manufacturers adopting new digital technologies and techniques and this factor driving changes to workforce plans. While technology is changing the workplace and the way manufacturers work, manufacturing employers (and arguably their employees) opt for face-to-face communication over the use of technology. However, when speaking to manufacturers, we discovered that they are keen to ensure that face-to-face communications remain at the forefront, but they are increasingly looking for a blended mix of communication channels.

While these more traditional forms of communication are important, especially when it comes to engagement with production staff, access to better, quicker, more-advanced technology presents manufacturers with the potential to offer greater flexibility to their workforce. Organising face-to-face meetings through Skype, FaceTime or Lync is one way to allow production staff to have that face-to-face engagement and at the same time to allow team managers to work remotely or off site. Some companies we spoke to make laptops and other digital devices available to production employees to use as and when needed, but this isn't always viable to offer to every employee.

However, the way in which employees work is evolving

Manufacturers are offering agile ways of working to both production and non-production employees, resulting in a change in the way they work. Many of the drivers behind offering these forms of work relate to a number of challenges highlighted earlier in this report: productivity, skills shortages and digital technologies.

> Only **15%** of manufacturers do not offer flexible working practices to production employees and **7%** to non-production employees

While retaining existing employees is the primary reason to offer flexible working (74%), employees are also demanding it from manufacturers (59%), and manufacturers are responding – with 56% offering flexible working in order to be attractive to prospective employees.

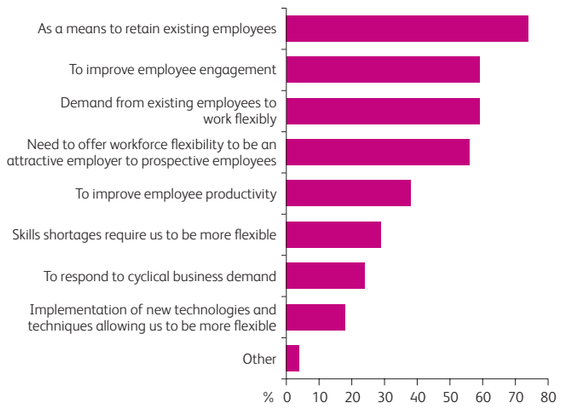
Some companies are making the link to productivity gains

We found that large companies (those with 250+ employees) are more likely and able to offer flexible and agile working practices to improve employee productivity (60%), compared with smaller companies (those with 51–100 employees) (25%). Adopting new technology and techniques can help to boost employee productivity. To take full advantage of this, manufacturers must develop the right culture around this change.

However, previous EEF research found that not having the right culture within a business towards change was a barrier to adopting new technology and techniques. Having capable leaders is paramount, yet, as we have found in wider EEF work, leadership and management skills remains the missing link.

Chart 5: Manufacturers offer flexible working to retain existing employees

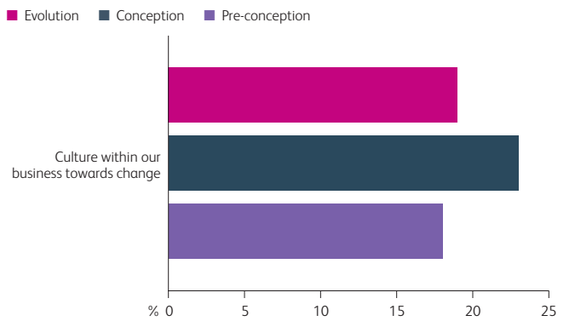
% of manufacturers offering flexible working to employees



Source: Modern Manufacturing Workplaces survey, 2018

Chart 6: Culture within a business is a barrier standing in the way of a digital future

% of manufacturers reporting that culture within business is a barrier to a digital future



Source: EEF, Manufacturing Outlook Survey, 2018 Q2

3. CHANGING RECRUITMENT PRACTICES

Manufacturers are expecting their workforce to expand in the next five years

Two-thirds of manufacturers say that they expect their workforce to increase in the next five years, with almost one-quarter (24%) expecting an increase of between 6% and 10%. This is primarily driven by the introduction of new products and the adoption of new technology and techniques, debunking the myth that the introduction of technology will lead to job losses.

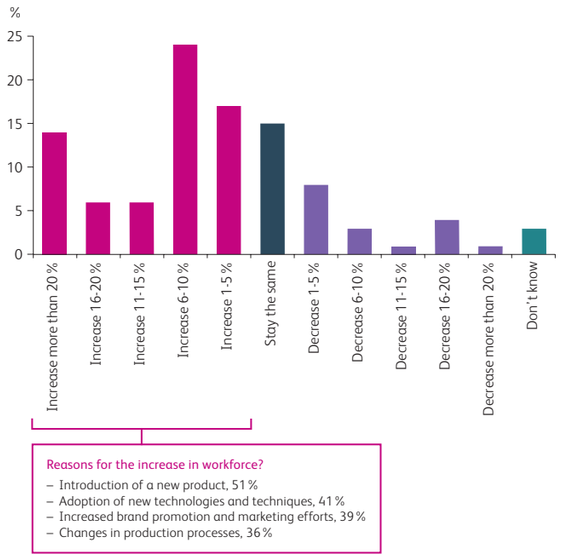
To ensure they have the skills they need, some manufacturers are recruiting from other industries

If the workforce is to continue to grow, manufacturers need to ensure that they still have the right people with the right skills. In line with previous EEF research, manufacturers are introducing or continuing to run formal apprenticeship programmes (72%), and a little more than one-third (36%) are introducing or continuing to run graduate programmes. This focus on apprenticeships is unsurprising, given both the tradition of manufacturers offering apprenticeships and the introduction of the Levy, which is likely to have shifted focus from graduates to apprentices.

In addition, almost half (48%) are revising their recruitment strategy to employ workers with transferable skills from other industries and sectors. This suggests that, in line with our findings earlier, manufacturers are recognising the shrinking talent pool available to them and are beginning to actively recruit from elsewhere. This places greater emphasis on the need for employees to have transferable skills in the next five years.

Much of the Government's narrative on this to date has been around "basic skills", but for this approach to be effective there will be a need to split this between basic employability skills and basic technical skills. Companies told us that they would often recruit from sub-sectors of manufacturing, such as organisations in the aerospace sector recruiting from defence. But this could be opened more widely if we were to equip the wider workforce with the right technical skills and not just basic employability skills. There is an opportunity for the Government to achieve this through the newly announced National Retraining Scheme; therefore, getting the model for this right from the start is crucial.

Chart 7: Expected change in number of employees in the next five years



Source: Modern Manufacturing Workplaces survey, 2018

Image 4: What are manufacturers doing to secure the skills they need for the future?

Source: Modern Manufacturing Workplaces survey, 2018

4. INVESTING IN AUTOMATION

The level of investment in automation remains mixed among manufacturers

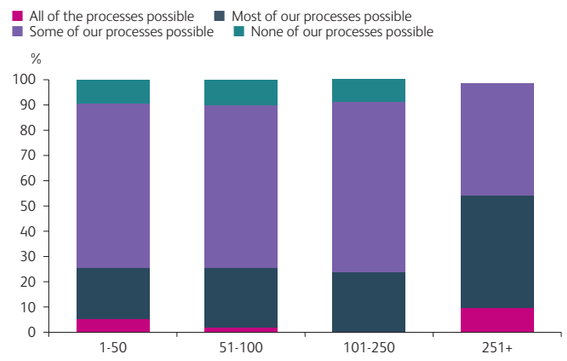
Automation is a potential solution to manufacturers' problems of a growing skills gap and flatlining productivity. The use of machinery, robots and automation is synonymous with productivity improvements and improving production processes, which is a virtuous cycle. However, previous EEF research has found that the level of investment in automation is mixed. When comparing robot density, UK manufacturing uses 71 robots per 10,000 employees compared to 305 in Japan, 301 in German and 176 in the USA.[14]

There is also a big difference in the size of manufacturing companies that have begun to invest in automation, with larger manufacturers more likely to automate all, most or some of their production processes.

Despite there having been investment in machinery over the last few years, our previous research suggests that manufacturers are not always seeing investment as a means to increase production processes and improve efficiency. The use of machinery, either alongside labour or standalone, can help to address the productivity issue and also help to fill the gap in skills, particularly at technician level. However, lack of appropriate skills remains a significant barrier to the implementation of automation in workplaces.

Chart 8: Process automation has some way to go

% of companies investing to automate manufacturing processes by number of employees



Source: EEF, Investment Monitor, 2017/18

5. OFFERING AGILE WAYS OF WORKING

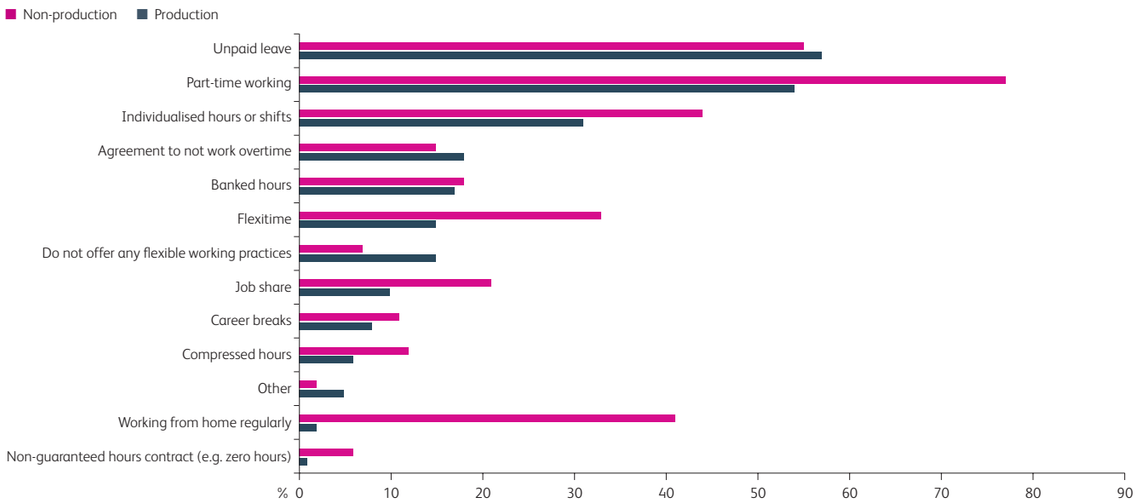
Manufacturers are offering their employees agile ways of working through practices such as part-time working patterns, unpaid leave and flexitime

Our survey finds that, naturally, the type of agility manufacturers can offer their employees depends on whether they work in production or not. Only a small number of employers do not offer agile ways of working to production and non-production employees (15% and 7% respectively). The most popular form of agile working offered for production employees is unpaid leave (57%), closely followed by part-time working (54%).

However, for non-production employees, manufacturers offer slightly different agile ways of working, given the nature of their jobs. In particular, working from home on a regular basis (41%) and individualised hours or shifts (44%) are among the most popular agile ways of working offered to non-production employees.

[14]EEF, Investment Monitor, 2017/18

Chart 9: Different types of flexible working practices that companies offer to production and non-production employees



Source: Modern Manufacturing Workplaces survey, 2018

Despite this progress, the options to work flexitime or to job share remain exceptions rather than the norm. By offering agile ways of working to both existing and prospective employees, manufacturers can attract and retain talent. In fact, 74% of manufacturers said they offer agile ways of working as a means to retain existing employees, and 56% said it helps to make them attractive to future employees.

However, the full benefits of offering agile ways of working go beyond just recruitment and retention. It improves employee engagement in the business and boosts employee productivity. While 59% of manufacturers offer agile ways of working to improve employee engagement, only 38% see it as a means to improve productivity.

56% OF MANUFACTURERS **OFFER** **FLEXIBLE WORKING TO MAKE THE** BUSINESS MORE ATTRACTIVE **TO FUTURE EMPLOYEES**

38% OF MANUFACTURERS WANT TO IMPROVE **EMPLOYEE PRODUCTIVITY BY OFFERING FLEXIBLE WORKING**

74% **OF MANUFACTURERS** OFFER AGILE WAYS **OF WORKING TO RETAIN EXISTING EMPLOYEES**

59% OF COMPANIES **OFFER** **AGILE WAYS OF** WORKING TO **IMPROVE EMPLOYEE ENGAGEMENT**

PART 3: THE BARRIERS – WHY HAS THE ACTION NOT BEEN ENOUGH?

Building agile workforces as well as workplaces is a chicken-and-egg situation – which one do you fix first? While manufacturers are clearly taking action, this does not seem to be enough. This is because action is never easy. Sometimes the policy landscape presents the challenge; at other times it is internal within the business. Nevertheless, both are equally as important to overcome and need to be tackled head on.

1. BARRIERS TO BUILDING AGILE WORKFORCES

A. RETRAINING AND UPSKILLING EMPLOYEES IS CHALLENGING

With a growing skills gap, manufacturers are upping their investment in their current workforces: 46% are increasing training budgets, 72% are introducing or continuing to run formal apprenticeships and 36% are introducing or continuing to run graduate programmes. However, accessing this provision and training for existing employees is difficult. Provision across the country remains patchy, and not all manufacturers are able to train their employees to the standard and quality they need for their business.

Furthermore, the opportunity for employees to access training through part-time, online and evening classes remains sporadic. Not all higher education institutions offer flexible forms of learning, which limits the ability of existing employees to upskill or retrain to adapt to changing workplaces. As a result, it is no surprise that the 2017 Made Smarter Review found that, compared to EU counterparts, employers in the UK spend half as much on continuing vocational training.

OPEN UNIVERSITY (OU) CASE STUDY

The OU has taken an innovative approach to providing online, flexible, distance learning. Using virtual reality, OU has set up OpenSTEM labs, which allow those who study STEM subjects to use expensive research-grade scientific equipment – such as microscopes, robots and robotic rovers, telescopes, lab-bench experiments and analytical instruments – over the internet, and at a time to suit them. They can send real-time control commands, monitor real-time performance and download their data for subsequent analysis. Interactive learning is enabled through scripted tasks, much as in conventional practical work.

The creation of OpenSTEM labs has given students the flexibility of learning anywhere through access to high-quality content in a collaborative and interactive way, as well as the veracity of using real equipment in real time. One of the benefits of this has been that 43% of OU STEM students are women, 73% are working full-time or part-time while studying, and the average age of students is 28. This is just one way of making learning accessible to everyone.

B. RECRUITING FROM OTHER INDUSTRIES AND SECTORS CAN BE HARD AND UNKNOWN

Almost half of manufacturers said they are revising their recruitment strategy to actively recruit employees with transferable skills from other industries and sectors (48%), with most continuing to recruit for the skills they need through running formal apprenticeships (72%). The manufacturers we spoke to said that recruiting from different industries can be challenging, as the candidates don't have the business-specific skills required to work in the manufacturing industry. This holds true particularly for smaller companies, who are less likely to recruit from different industries and sectors (34% of manufacturers with 1–50 employees compared to 62% for those companies with over 250 employees). However, with a shrinking talent pool and an ageing workforce, manufacturers may be missing an opportunity here.

ENGINEERING EMPLOYMENT AND SKILLS SHORTAGE - A POTENTIAL SOLUTION?

Engineering UK research (Voice of Workforce survey) found that 65% of engineering professionals would consider transferring to work in a different sector, and a further 56% said they would consider transferring to a different skillset. For example, employees with experience in the automotive sector are moving across to smart infrastructure. Furthermore, those in the water sector are looking to upskill tunnelling engineers from the rail sector to help fill their skills gap.

This is driven by engineers wanting to apply their skills to new sectors and work on flagship projects, and remains a top reason to join a new employer. With a growing skills gap and a shrinking pool of talent, there is a clear opportunity to use the flagship projects currently being undertaken in the engineering sector, e.g. Crossrail and HS2, to both maximise the existing talent pool and attract a new cohort of talent with transferable skills.

2. BARRIERS TO BUILDING AGILE WORKPLACES

A. ADOPTING NEW TECHNOLOGY CAN BE CONSUMING IN TERMS OF BOTH COSTS AND RESOURCES

Investment in new technology and techniques can be costly for manufacturers, and consequently deters them from making the investment in capital equipment that can help to reinvent manufacturing workplaces. Previous EEF research has found that cost, in particular the high upfront cost of equipment, is the biggest barrier to investment in automation.[15] It is not, however, a lack of manufacturers being unprepared or unwilling to invest in automation, but rather manufacturers are competing to use a finite resource across their business.

There is also the issue around capability as a barrier to greater investment in new technology, particularly investment in automation: three in ten manufacturers have said that workforce skills are a clear barrier to investment.[16] Some companies are investing in technology as a means to overcome their skills gap issues; however, they lack the right capability to be able to implement this as a solution. This is likely to be one of the underlying reasons for companies being unable to apply current technology to their business processes.

[15]EEF, Investment Monitor, 2017/18
[16]EEF, Investment Monitor, 2017/18

B. OFFERING ALTERNATIVE WAYS OF WORKING THROUGH GREATER FLEXIBILITY IS NOT ALWAYS POSSIBLE

Agile working is not possible in every corner of the manufacturing workplace. This is obvious from the variation of flexibility between production and non-production employees, with the latter being able to take advantage of more opportunities. The main barrier (cited by 66% of manufacturers) is that the setup of production prevents the ability to offer greater workforce flexibility. In a similar vein, 14% of manufacturers cite the availability of the right IT equipment as a barrier to work in a more agile way. With 15% of companies citing the cost of implementing workplace flexibility, there is potential for the adopting of digital technologies and techniques to reduce the costs.

CEEMET: SMART INDUSTRIES AND WORKPLACE INNOVATION

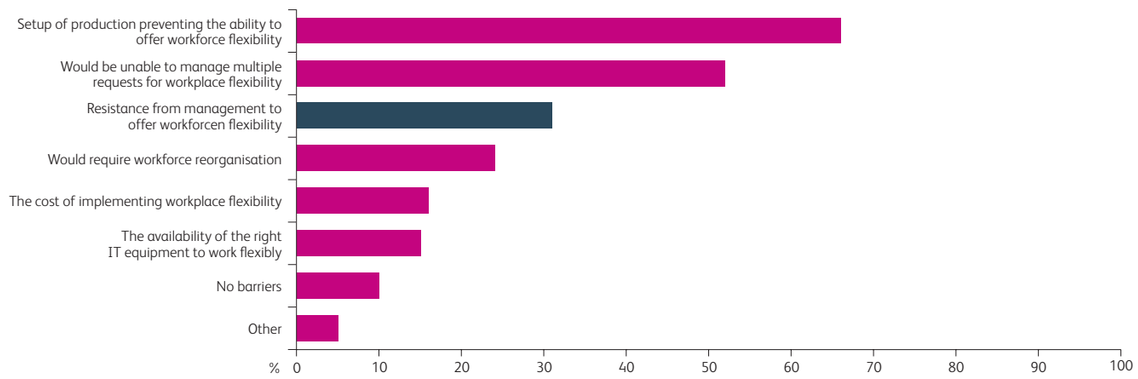
The UK manufacturing industry is not alone in this. CEEMET research has found that in MET industries across Europe, work practices have remained the same. However, technological change has upended this, resulting in the deployment of labour not always being aligned with production needs and employee requests for greater agility. These new technologies can enable greater autonomy for employees, and also drive higher productivity and shorter product and delivery times. FME, a Dutch manufacturer in the MET industry, has utilised the opportunity offered by ICT solutions, creating 'field labs' and practical environments to develop, learn and test new smart solutions for the business. The benefits of the field labs are as follows:

1. Develop a learning culture in the organisation;
2. Modernise the relationship between employers and employees;
3. Make lifelong learning possible;
4. Improve team performance and opportunities to work flexibly.

Business culture and attitudes also come into play, with almost one-third (31%) of manufacturers saying there is resistance from management to offer workforce flexibility. As with the introduction of any new policies or processes, buy-in from senior management is crucial. It is concerning that companies are still seeing the unwillingness of senior leaders to adopt workplace flexibility, given the benefits that can be achieved from doing so.

Chart 10: Capacity and culture are key barriers to further workplace flexibility

% of manufacturers reporting barriers to offering flexible working



Source: Modern Manufacturing Workplaces survey, 2018

PART 4: THE CALL TO ACTION

Manufacturers face barriers in being able to reinvent their workforce. As we gear up for a period of significant change, below are our calls to action for Government and manufacturers to address the big challenges highlighted in this report and to reinvent the manufacturing workplace.

1. **The National Retraining Scheme must prioritise workers with existing transferable skills who will be primed to adapt to the digital technologies of the future in sectors.**
   There is a proven skills shortage in Level 4+ STEM skill roles and a pressing need to fill this gap in the short term. Relying on new entrants through the education system would entail a time lag, therefore the National Retraining Scheme should focus on retraining existing workers in sectors other than engineering and manufacturing whose transferable skills would be in demand and would go some way to filling the Level 4+ STEM skills gap. This would be significantly increasing the scope of the scheme, which is now only focused on those with lower-level skills whose jobs are at risk of automation and/or AI.

2. **The Apprenticeship Levy must be reformed to face the future challenges of digitalisation and AI.**
   The Government should focus the spend of the Apprenticeship Levy to make the right investment for the right future returns. There should be enhanced support for apprenticeships in sectors where these skills will be most needed in the future and where supply is poorest. Any cash injections should be focused here.

3. **Cultural barriers in workplaces resisting change need to be tackled from the top.**
   Businesses should embrace agile and flexible working throughout their organisations, encouraging others to do so and setting standards by embracing it themselves. Business leaders should publicly celebrate how they have achieved this, displaying the benefits to their business and employees. The cultural shift by management would signal to employees that the business is open to change and innovation.

4. **Agile working needs to be accompanied by agile learning, with lifelong learning and upskilling omnipresent in every business.**
   With some 80% of the future workforce already in work, a shrinking talent pool and the arrival of new technology, there is a need to make upskilling and lifelong learning accessible to all workers, whatever their working patterns. Employers and training providers must make better use of at-a-distance methods such as online training, part-time degrees and apprenticeships (as suggested above). However, to do this, the Government must ensure that training is both supplied and co-funded in blocks. This could be funded through the unspent immigration skills fund.

5. **Manufacturers should expand the talent pool from which they recruit.**
   With the majority of manufacturers missing out on almost half the talent pool, leaders within business organisations should set targets for reducing their gender pay gap, improving female participation and promoting greater diversity, including those of BAME backgrounds. This will help to expand the pool from which they are currently recruiting. Industry-led and -driven schemes work well, and the Government should appoint a leading industry figure to take this forward.

6. **Skills funding should be remapped to encourage employers to adopt agile and diverse working policies and practices.**
   Enhanced funding should be made available for businesses that can demonstrate progress in their investment in new digital skills, agile working and learning, and greater female participation where their gender bias is significantly female-negative. New apprenticeship standards should all be deliverable by agile methods and accessible to all workers, whatever their working patterns. The Government should work with employers and providers to develop and deliver part-time apprenticeships and modular-based apprenticeships. With technology allowing for more adaptable and flexible forms of learning, modular-based apprenticeships would make it easier for employees to undertake training. It would also open the doors to a wider group of employees, including women, who may benefit from part-time provision.

Working Down T'Mill, taken by Mark Tomlinson at Liberty Steel in Stocksbridge, South Yorkshire, shortlisted in the amateur category of the EEF Photography Competition 2017.

Make UK champions and celebrates British manufacturing and manufacturers.

We are a powerful voice at local, national and international level for small and medium sized businesses and corporates in the manufacturing and engineering sectors.

We're determined to create the most supportive environment for UK manufacturing growth and success. And we present the issues that are most important to our members, working hard to ensure UK manufacturing remains in the government and media spotlight.

Together, we build a platform for the evolution of UK manufacturing.

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Touchscreen Technology, taken by Laurence Sweeney at Zytronic PLC, shortlisted in the professional category of the EEF Photography Competition 2016.

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