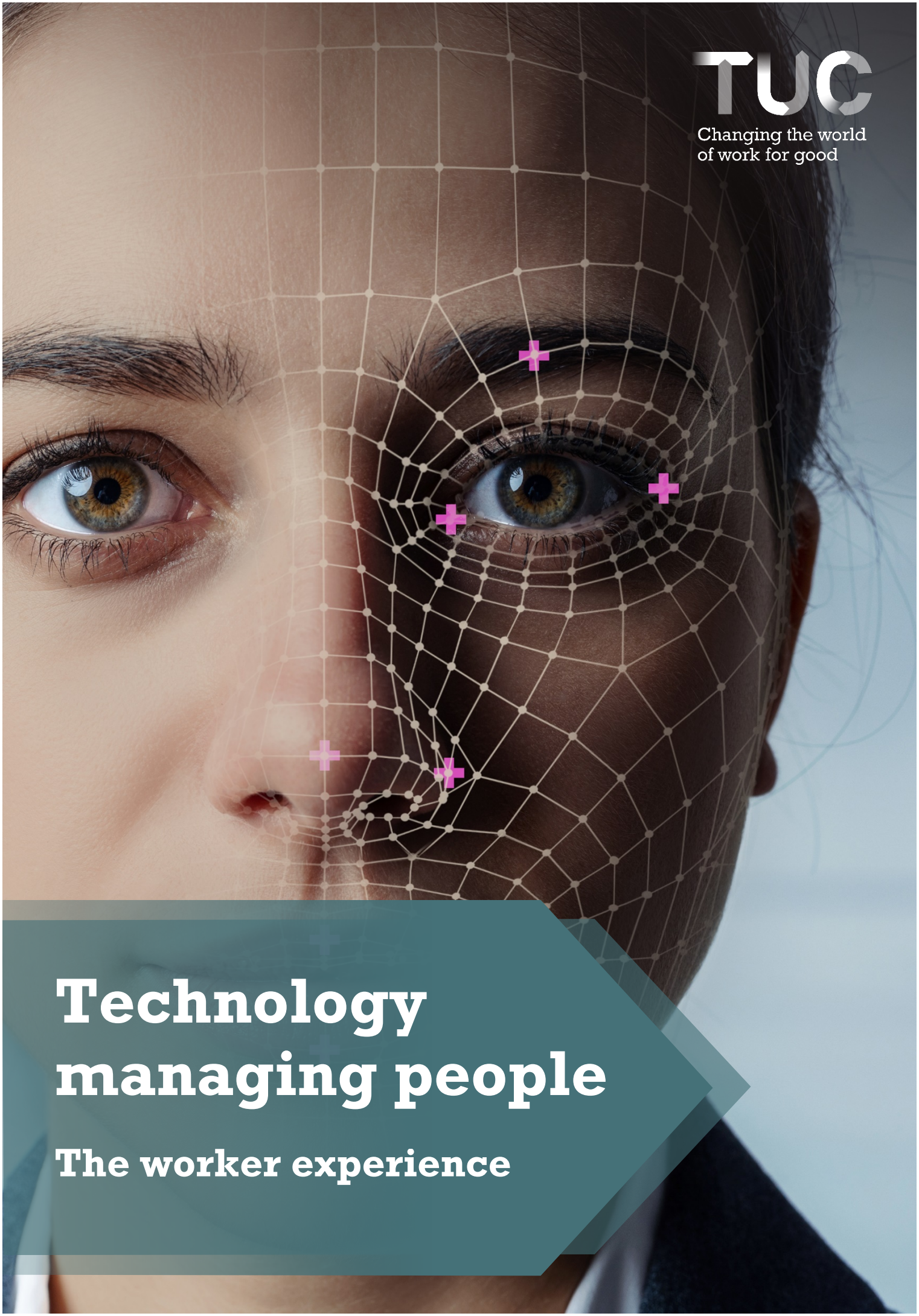

TUC

Changing the world of work for good

Technology managing people

The worker experience

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Contents

Short summary

This report is intended to raise awareness of the experience of workers and trade unions when artificial intelligence (AI) is used by employers to carry out people-management functions, and to identify objectives to ensure that the interests of workers are not overlooked in the use of AI.

Over the past few years, there has been nothing short of a technological revolution going on at work.

However, while the impact of automation on functions such as the manufacture of goods and provision of retail services is well recognised, far less attention has been given to the rapid development of AI to carry out management functions.

Aspects of the employment relationship (for example, decisions on recruitment, line management, monitoring and training) are increasingly being managed by AI, instead of by a person.

When we asked workers about their experience of technologies making or informing decisions about them at work, 22 per cent who responded said they had experience of use of technologies of this type for absence management, 15 per cent for ratings, 14 per cent for work allocation, 14 per cent for timetabling shifts, and 14 per cent in the assessment of training needs and allocation.

The use of AI in this way has significant implications for workers in terms of their employment rights, such as their rights to equality, privacy, and data protection, their physical and mental wellbeing, and wider issues such as the balance of power between employers and the workforce, and democracy at work.[1]

And yet many people do not know what these AI-powered management tools are, how they operate, and what their impact is. Indeed, it is very likely that these technologies are far more widespread than our survey results suggest.

When we asked workers whether it was possible that the AI-powered technologies we had highlighted to them were being used at their workplace, but that they were just not aware of this, a shocking 89 per cent that responded said either "yes" or "not sure".

We suspect this is largely due to a lack of consultation and transparency regarding the use of AI at work, and in relation to the collection, use and ownership of worker data.

Our research revealed that only 28 per cent of workers are comfortable with technology being used to make decisions about people at work.

This report highlights these issues by considering:

- the worker experience of AI-powered technologies being used for management purposes
- the impact on workers of the use of these technologies
- objectives to ensure AI technologies meet worker and trade union needs.

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[1] https://uklabourlawblog.com/2020/09/10/automated-management-and-liability-for-digital-discrimination-under-the-equality-act-2010-by-joe-atkinson/amp/?__twitter_impression=true

Our report is informed by a TUC survey of both workers and trade union reps, as well as BritainThinks polling and a literature review.

The report is the product of the first stage of a TUC project on AI and the employment relationship.

The second stage of the project will build on the objectives identified in this report. These objectives include achieving stronger consultation and transparency over the use of AI at work, a focus on the importance of worker wellbeing, achieving fair, lawful use of AI that is accessible and useful to all, and increasing worker control and understanding of data.

A legal and policy report with recommendations for reform will follow in early 2021, and a guide for trade union representatives later in 2021.

Longer summary

Worker experience

In this report, we seek to raise awareness of management by AI-powered technologies, and the implications of their use for workers, by giving specific examples of the worker and trade union experience.

We consider the use of these technologies at different stages of the employment relationship, including recruitment, line management functions, monitoring and surveillance, ending employment, and the impact on collective action.

We also identify themes that emerged from our research and use these to articulate objectives for workers and the trade union movement, to ensure that the worker perspective is taken into account, and that technology is used for the benefit of all, not just employers and corporations.

The development of new technologies, including those powered by AI and machine learning, is transforming the world of work.

Considerable public attention has been given to the impact of growing automation in the workplace in sectors such as retail and manufacturing, where automated processes have increasingly replaced the role of people, for example at supermarket checkouts and on production lines.

Meanwhile, however, there has also been a quiet technological revolution taking place in how people are managed at work.

AI-powered tools are now used at all stages of the employment relationship, from recruitment to line management to dismissal. This includes the use of algorithms to make decisions about people at work.

TUC research suggests that these technologies may currently be more common at some stages of the employment relationship than others (for example, in training, monitoring and surveillance and recruitment – see Figure 2) but we predict that over the next decade there will be an explosion in the use of AI in all areas of people management.

This report is informed by a TUC survey of both workers and trade union reps, as well as BritainThinks polling and a literature review. Section 1 of this report introduces the surveys and polling, with methodology set out at Appendix. The TUC surveys are not representative and are simply intended to give a snapshot insight into the experience of AI of workers, especially those associated with trade unions. However, the BritainThinks polling does provide representative insights.

When we asked workers about their experience of technologies making or informing decisions about them at work, 22 per cent of workers who responded said they had experience of this for absence management, 15 per cent for ratings, 14 per cent for work allocation, 14 per cent for timetabling shifts and 14 per cent in the assessment of training needs and allocation.

A recent survey conducted by Ipsos for the European Commission illustrates the extent to which the use of AI is likely to grow across different enterprises. The study found that 42

per cent of enterprises currently use at least one AI technology, a quarter of them use at least two types, and 18 per cent have plans to adopt AI technologies in the next two years.[2]

In the shorter term, the Covid-19 pandemic, resulting in increased home working and new health monitoring technologies, has almost certainly already increased the use of AI-powered technologies to manage people.[3]

A recent survey conducted by the LSE's Centre for Economic Performance found that more than 60 per cent of firms have adopted new technologies or management practices since the start of the pandemic and more than 90 per cent said they expected to keep the changes in place. Out of the firms who had not adopted new technologies, a third planned to do so in future.[4]

Implications for workers

The implications for workers who are managed by AI are significant, yet our research suggests worker interests may often be marginalised or overlooked when new technology is introduced at work.

The use of AI in people management can also impact on the employment rights of workers. For example, the deployed technology might result in discriminatory and unfair outcomes for workers, their human right to privacy might be infringed, and their data might not be handled in accordance with data protection law.

In addition, there are significant implications in terms of workers' physical and mental wellbeing, for example when workers experience the extreme stress and pressure of constant, AI-driven 'real-time' performance assessment and monitoring.

The responses to our surveys also suggest that data knowledge, control and ownership lie at the heart of how AI impacts on workers.

Only 6 per cent of workers who responded to our survey question on consent to AI-powered recruitment and management technologies said they had been asked for consent before this was used.

Only 5 per cent of workers responding to our survey question about trust said that they would trust technologies that involve AI, machine learning and algorithms to make decisions about them at work.

Our BritainThinks polling revealed that only 28 per cent of workers are comfortable with technology being used to make decisions about people at work.

All these issues are relevant to the relationship between workers and employers, and the balance of power and influence between the two.

There are significant commercial interests at play.

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[2] European enterprise survey on the use of technologies based on artificial intelligence https://ec.europa.eu/digital-single-market/en/news/european-enterprise-survey-use-technologies-based-artificial-intelligence#:~:text=European%20enterprise%20survey%20on%20the%20use%20of%20technologies,adopt%20AI%20technologies%20in%20the%20next%20two%20years

[3] *Robin Allen QC and Dee Masters in conversation with TUC, Employment Rights After Coronavirus – technology at work* https://www.youtube.com/watch?v=JDYsBkzA_BQ

[4] http://cep.lse.ac.uk/pubs/download/cepcovid-19-009.pdf

Despite the terrible economic damage caused by the coronavirus crisis, tech companies continue to grow in value[5] and secure significant funding.[6]

Many of the companies responsible for the creation of the AI systems being used in UK workplaces are global corporations. The global nature of the corporations creating AI and collecting data means trade deals and international relations present implications for control over data and access to source code.[7]

We believe that the problems associated with the regulation of AI at work must be approached with an international perspective.

Behind the value of these (often global) companies is the value of the data they accumulate about people.

The commercial drive to create, market and sell AI systems is powerful, as is the drive for employers to automate people-management functions for cost efficiencies. As a result, commercial and employer interests are well represented in relation to the use of AI, yet the worker voice is not.

It is only with a collective voice, active consultation and access to understandable information that workers and trade unions can redress this imbalance.

Our research suggests strong worker support for more consultation. For example, 75 per cent of workers taking part in the BritainThinks polling agreed that employers should be legally required to consult and agree with workers any new form of monitoring they are planning to introduce.

Artificial intelligence at work should be for the benefit of all, not only those who are commercially motivated to develop, buy and influence the application of AI.

Key objectives

These are the key worker and trade union objectives that have emerged from the first stage of the TUC's AI project:

Worker voice

- Secure strong collective bargaining on technology at work and data.
- Achieve more worker consultation on the development, introduction, and operation of new technologies.
- Empower workers and trade unions with technical knowledge, understanding and vocabulary, to enable negotiation, communication, organising and lobbying.

Fairness and equality

- Secure ethical and socially responsible development of AI, for the benefit of all, not only employers and commercial interests.

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[5] https://www.nytimes.com/2020/08/19/technology/big-tech-business-domination.html

[6] Legion, an AI workforce management company, has just secured $22m in a Series B funding round https://www.techsutram.com/2020/09/ai-startup-legion-secured-22-million.html

[7] https://www.ituc-csi.org/e-commerce-wto-corporate-greed

- Ensure equality of outcome and access, including non-discriminatory outcomes from use of AI-powered technology and equal access for all.

Transparency

- Increase availability of accessible and understandable information on how AI technology works, but also on how worker data is used to inform AI powered tools, and across AI platforms.
- Increase worker awareness of when AI is operating and ensure consent is obtained where appropriate.

Worker wellbeing

- Protect workers' physical and mental health.
- Help workers establish a decent work/life balance and appropriate boundaries between work and personal life, including when working from home and in relation to use of digital devices.
- Ensure employers meet regulatory health and safety obligations, but also decent work practices and standards agreed with the workforce.
- Ensure effective enforcement of regulatory health and safety obligations.

Lawful AI

- Ensure that AI deployed in the workplace is lawful and that where it is not, workers have access to legal redress.
- Secure effective regulatory protection against infringement of employment rights, including rights to privacy, data protection and non-discrimination.
- Ensure effective enforcement of rights with timely intervention by regulators, as well as mechanisms to prevent and deter use of unlawful AI.

Collaboration

- Encourage a collaborative approach, with workers, trade unions, employers, technologists, regulators and government working together.
- Facilitate more active engagement with technologists by trade unions and workers.

Control over data

- Educate and inform workers and trade union reps regarding the value of personal data, the implications of data ownership, and the data components of AI systems.
- Enhance worker awareness of how employers use their data.
- Ensure workers understand, control and influence how their data is used by employers.
- Data used in AI components must be accurate and fair data.

Internationalism

- Ensure that we work with and learn from international partners and take into account how international relations and trade deals may impact on data control and transparency.

Opportunity

- Initiate the development of AI technologies at work which can be used for the benefit of workers and trade unions.
- Investigate worker/trade union-led ways in which data can be collected and used to further worker and trade union interests.

Section 1

Trade unions, workers and artificial intelligence

In this section, we outline the project currently being undertaken by the TUC to investigate the use of AI in the employment relationship. We also introduce the surveys and polling we carried out to inform this report.

TUC AI Project

This report is part of a wider project being undertaken by the TUC to explore the use of AI to manage people at work. The project is supported by a working group of around 20 affiliate and international trade union representatives and legal experts.[8]

At the beginning of 2021, the TUC will publish a legal and policy report that will outline the legal tools available to workers when the use of AI goes wrong, and proposals for reform that put the interests of workers and trade unions first.

The legal and policy report will build on the objectives identified in this research report.

Later in 2021 the TUC aims to produce an AI technology and data guide for trade union representatives, as well as a training programme.

Surveys

To inform this report, we conducted a survey of workers and a survey of trade union representatives.

We aimed to gain an insight into the types of technologies being used to manage people, the level of understanding and awareness of AI among workers, their experience of consultation, transparency over how the technologies operate, data control and ownership, and the ability to challenge decisions made by AI.

We asked a mixture of straightforward questions requiring a tick box or a 'yes' or 'no' answer, along with a series of questions with the possibility of an open box response.

The response to these surveys was unusually high, suggesting a good level of engagement and interest in this topic, with nearly 1,000 workers responding to most questions in the worker survey, and over 100 trade union reps responding to the trade union survey.

The TUC surveys are not representative (see methodology at Appendix), with most respondents to the worker survey being trade union members, and not all sectors being represented equally (education, public administration/defence/social security and health/social care were the sectors from which we received the greatest response).

However, as well as the quantitative data, the surveys produced a wealth of information about the worker and trade union experience in the responses to the open box questions. We analysed all these substantive responses and have directly quoted from them throughout the report, as well identifying themes that emerged from these accounts.

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[8] Robin Allen QC and Dee Masters https://ai-lawhub.com

The surveys were intended to provide some preliminary insights into the worker and trade union experience of AI, with much scope remaining for more detailed investigation into sector-specific worker experience of AI.

We also commissioned BritainThinks polling (see Appendix for methodology). This polling provides representative insights into specific areas in which AI is used, such as monitoring and surveillance. BritainThinks conducted an online survey of 2133 workers in England and Wales between 31 July and 5 August 2020. All respondents were either in work, on furlough or recently made redundant.

We also draw on the findings of a Thought Exchange survey of trade union priorities conducted by Prospect[9] for TUC Congress 2020.

[9] https://prospect.org.uk/news/collective-voices-on-data/

Section 2

What is artificial intelligence?

In this section, we consider some of the technical terminology used around AI, the different components of AI, and the extent to which people understand what AI means.

Getting to grips with this terminology is key to understanding the technologies we refer to in this report, and what their implications are for workers.

It's also helpful to consider how each of the objectives for workers identified in this report apply to the different components of AI.

It's not enough to see AI as a single concept: it needs to be understood as a system.

We then go on to look at the current understanding and awareness of AI shown among workers.

AI terminology

'Machine learning' and 'algorithms' are often referred to in relation to the use of AI.

Machine learning is when mathematical rules are used for the purposes of analysing data.

The mathematical rules applied by a computer in machine learning are called 'algorithms', but algorithms can also be used in many different contexts.[10]

When algorithms are used to come to decisions and make judgements, this is described as a system of artificial intelligence.[11]

AI is described as "the replication of human analytical and/or decision-making capabilities" in *Artificial Intelligence and Machine Learning for Business*.[12]

Algorithms are now responsible for many decisions made about people at work. For example, whether they receive a pay rise, are subject to a disciplinary measure, or are appointed to a new post.

Unfortunately, there is no single, agreed definition of AI, algorithm or machine learning.

In our AI worker survey Technology Managing People, we used the following definitions, designed to be straightforward and accessible:

- Artificial intelligence means when computers carry out tasks that you'd usually expect to be completed by a human. For example, making decisions or recognising objects, speech and sounds.
- Machine learning means when computer programmes are trained on data so that the programme can learn to carry out certain tasks.
- An algorithm used in technology is often a set of rules that a computer applies to make a decision.

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[10] https://www.youtube.com/watch?v=ZnBF2GeAKbo

[11] Allen, R. (2020). *Artificial Intelligence, Machine Learning, Algorithms and Discrimination Law: The new frontier*. Paper prepared for TUC Discrimination Law Conference, Congress Centre, 31 January 2020.

[12] Steven Finlay, Relativistic Books (2017), p10.

The key components of AI

As outlined above, an AI system has several different components.

Finlay describes the key components driving most AI/machine learning applications as being:

- data input and data processing
- predictive models generated by machine learning using historic data
- decision rules that might stem from a machine-learning algorithm. Decisions are made using the predictive models.
- response/output – an action based on the decisions.

Each individual component of an AI system (the data, the predictive models, the decision rules and the resulting action) has relevance for workers who are being managed by AI.

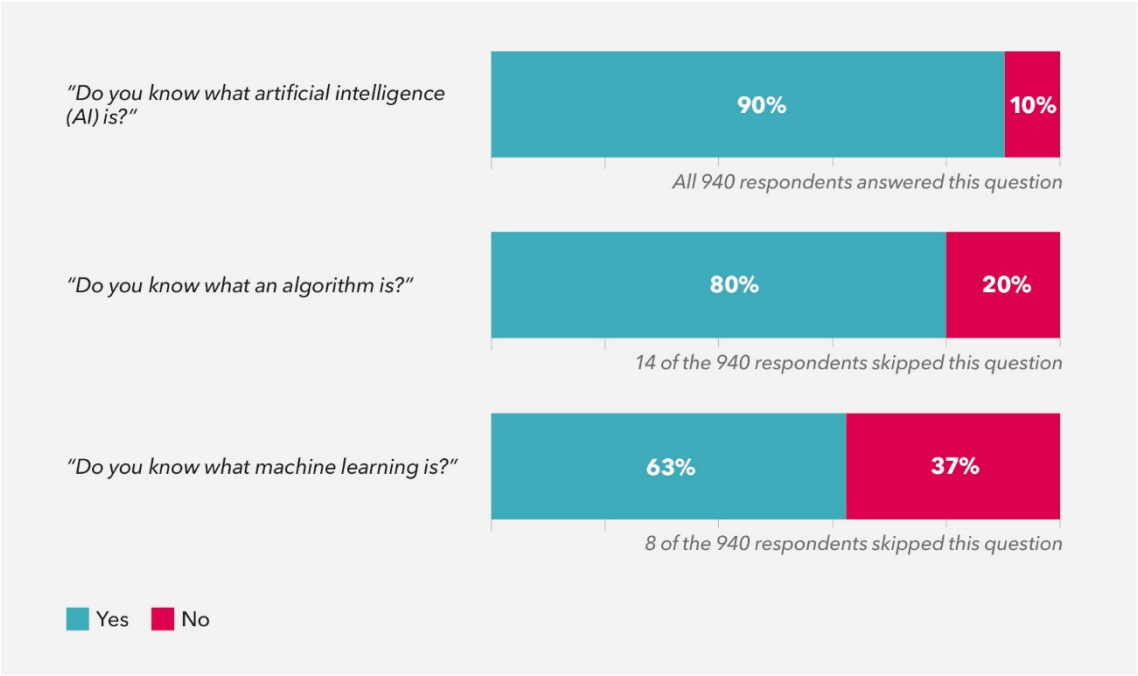
This is because the way in which each component of AI works will influence important decisions that are being made by AI about workers.

Understanding AI

A high number of workers responding to our survey question about understanding AI said they know the meaning of 'AI', 'machine learning' and 'algorithm'. This may be because the workers who chose to complete our survey have a particular interest in technology. Nonetheless, it was encouraging to see this level of understanding.

However, we believe workers not only need to understand what AI is, but to have adequate and understandable information about *how each component of AI works*, as well as influence over this.

Figure 1: Understanding terminology



Only with this knowledge and influence will workers be able to understand and challenge decisions made about them by AI and ensure that AI works not only in the interests of employer and corporations but also in their interests.

By the same token, we argue that employers themselves must also acquire a high level of understanding about what AI is and how it works.

Without this understanding, it will be impossible for workers, trade unions, employers and technologists to communicate about the fair operation of technology at work.

In a recent survey conducted by Ipsos for the European Commission, 22 per cent of enterprises were either unaware or not sure what artificial intelligence is.[13]

The experience of trade union representatives is that often managers do not understand how AI-powered technologies work, and that this inhibits communication and the ability to challenge decisions.

Our trade union reps survey revealed these observations about employers from reps encountering difficulties with challenging AI decisions:

- management refusing to listen and believing that algorithms and technology can't be wrong
- a lack of knowledge about the algorithms used or how they work
- a lack of technical knowledge and understanding.

Awareness of AI

A very common theme in both of our surveys was that workers and union reps felt there was a strong possibility that AI-powered technologies were being used in their workplace, but that they were simply unaware of this.

Unless workers are asked for their consent before AI systems are introduced at work, they may not know about an AI system being used.

Even if workers are aware of the AI system in place, they might have not have a complete picture of how the system is being used. For example, lecturers might be aware of an AI-powered platform used for teaching and monitoring pupil performance, but not know whether this system performance-monitors them as well.

When asked whether they were subject to monitoring when working remotely, one worker said:

> *"The worrying thing is that I have no idea – my instinct is that I'm not being monitored at all but how would I know if I was?"*

Another worker commented:

> *"Going through the survey I find my responses to be largely 'don't know', which is in itself concerning. If we don't know if something is being used or not, how can we know whether we object to it or are concerned about it?"*

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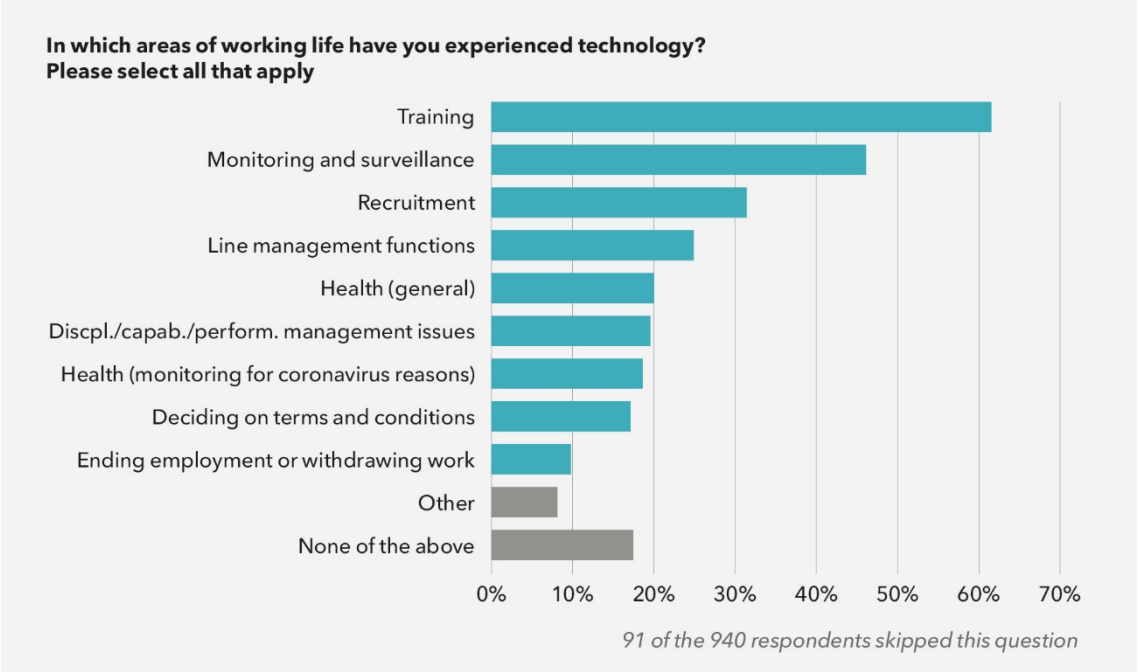
[13] European Enterprise Survey on the Use of Technologies Based on Artificial Intelligence https://ec.europa.eu/digital-single-market/en/news/european-enterprise-survey-use-technologies-based-artificial-intelligence#:~:text=European%20enterprise%20survey%20on%20the%20use%20of%20technologies,adopt%20AI%20technologies%20in%20the%20next%20two%20years

We asked workers responding to our survey about their experience of technology in different areas of working life, including recruitment, training, monitoring, line management functions, team development and ending of employment. The figure below provides an insight into the level of influence technology in general has in the management of workers.

Figure 2: Technology at work



Section 3

Being managed by AI

In this part of this report, we look at some of the AI-powered technologies that are being used to manage people in different ways, and the worker experience of this.

We consider the use of these technologies at different stages of the employment relationship, including recruitment, line management functions, monitoring and surveillance, ending employment, and the impact on collective action.

We give specific examples of the types of technologies being used to manage people at these stages of employment, along with insights into the extent to which these technologies are being encountered by workers and trade unions, and their experience of these technologies.

AI and people management

In the context of people management, AI systems are being used to collect and analyse data about workers, and to make decisions about them that impact on their working lives.

This process has been referred to as 'algorithmic management' by Jeremias Prassl in *Humans as a Service: The promise and perils of work in the gig economy* (OUP, 2018, p55) in the context of platform-based gig economy work.

AI-powered management practices are inevitably well established in platform work, where algorithms operate to match worker to work, monitor activities, allocate ratings and impose reward or disciplinary measures.

However, these practices are by no means confined to platform work.

Research undertaken by Ursula Huws at the University of Hertfordshire on behalf of FEPS and UNI Global Union[14] revealed that "the digital management practices associated with platform work extend broadly across the labour market and are not restricted only to platform work".

Acas has produced a research paper, *My Boss the Algorithm*, exploring the use of algorithmic management in the workplace.[15]

The evident spread of 'digital management practices' outside platform work is also supported by the findings of our surveys and the BritainThinks polling. Respondents to our worker survey frequently referred to an institution or company as their employer, and there was little suggestion they were undertaking platform work.

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[14] *The Platformisation of Work in Europe,* p32 https://www.feps-europe.eu/attachments/publications/the%20platformisation%20of%20work%20in%20europe%20-%20final%20corrected.pdf

[15] https://www.ipa-involve.com/Handlers/Download.ashx?IDMF=7129b512-2368-459a-898d-6d2b3457a039

Hired by AI

Recruitment by AI is a fast-growing phenomenon, added to by the current implications of the coronavirus crisis.[16]

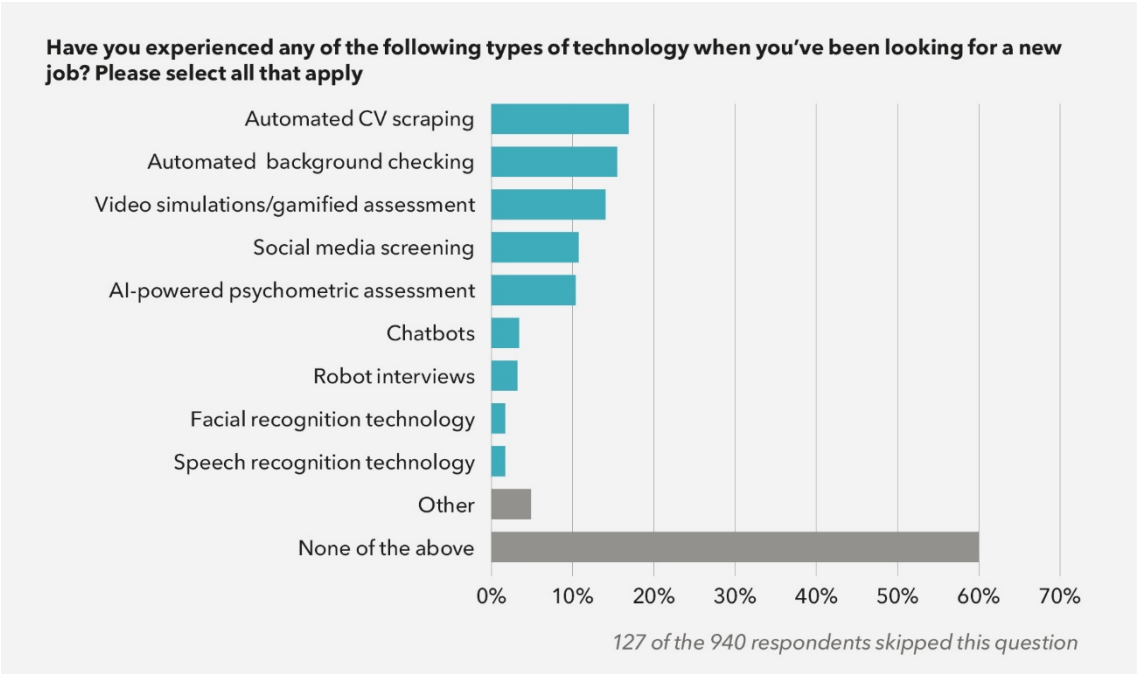
The global AI recruitment market has been predicted to reach a value of around $388m by 2027.[17]

The Financial Times reported in June 2020 on a survey carried out by the Institute of Student Employers which showed that in 2019 only 30 per cent of companies conducted in-person interviews at the first stage of a graduate recruitment process. The survey led the Institute to conclude that "online recruitment may become the new normal".[18]

AI-powered tools are being used at all stages of the recruitment process, ranging from sourcing candidates, to screening, interviewing candidates and the formation of job offers based on a predictive model.

We asked workers about their experience of different types of AI-powered technologies when being recruited.

Figure 3: Experience of AI technology when being recruited



The most commonly experienced technologies were automated CV 'scraping' – when CVs are scanned for key words and a decision then taken as to whether a candidate will proceed to the next stage of the process (17 per cent), automated background checking (16 per cent) and video simulations/game-based assessment (14 per cent).[19]

Social media screening[20] and AI-powered psychometric testing (both 11 per cent) were experienced slightly less often.

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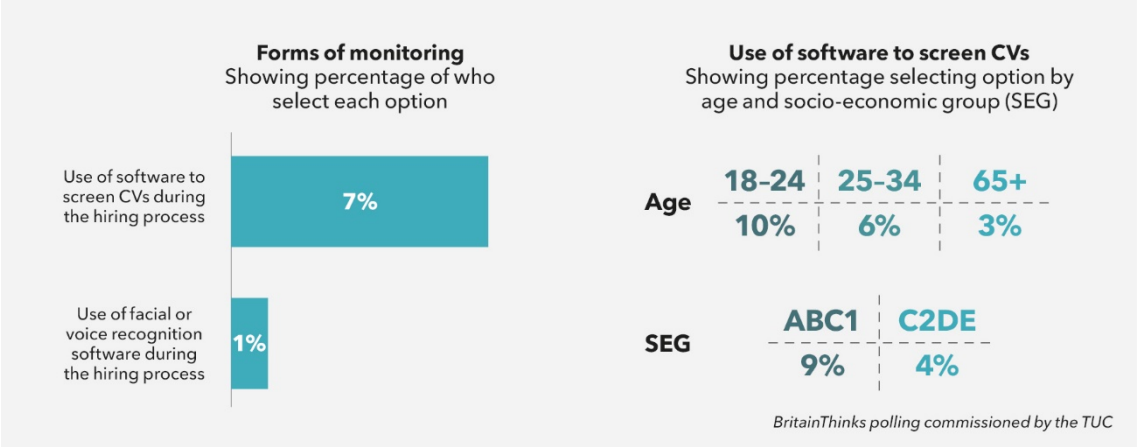
[16] https://www.hcamag.com/us/news/general/how-covid-19-is-accelerating-hiring-automation/230456
[17] https://www.fnfresearch.com
[18] https://www.ft.com/content/b24a7e9e-a1c1-11ea-b65d-489c67b0d85d
[19] https://www.imbellus.com/#/
[20] https://www.goodegg.io/social-media-screening

The use of chatbots – software carrying out text chat (4 per cent) and robot interviews (3 per cent) did not seem widespread, and only 2 per cent of the workers said they had experienced facial recognition technology (FRT) or speech recognition technology (SRT).

FRT and SRT are AI-powered technologies capable of analysing facial expressions, tone of voice and accent and coming to conclusions about candidates' suitability based on this information.[21]

The BritainThinks polling revealed a similarly low level of experience of FRT and SRT during the hiring process, with only 1 per cent of respondents saying they had experienced this. In relation to CVs, 7 per cent had experienced the use of software to screen CVs.

Figure 4: Perception of use of screening software, by age and socio-economic group



When considering these insights, it's worth keeping in mind the likelihood of worker awareness of the presence of AI. It is notable that the technologies that appear to have been experienced most (CV and background checking) were probably used during a fully automated first stage of a recruitment process.

Fully automated recruitment tends to be a first stage hurdle, with human interventions such as interviews coming next.

A fully automated initial recruitment stage would be far more obvious to a candidate than automated tools used at a later recruitment stage. For example, the use of FRT and SRT in a video conferenced interview may not be obvious to a candidate at all.

Many of the video conference platforms used for interviews have a built-in FRT or SRT facility, but this will not necessarily have been disclosed to candidates when they are being interviewed.

It is also of note that the BritainThinks polling reveals younger people are either experiencing the use of automated CV screening more or are at least more aware of it (Figure 4 above).

Sam Adler-Bell and Michelle Miller, in their article "The Datafication of Employment"[22] highlight how employers are becoming increasingly reliant on workforce data analytics during the hiring process:

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[21] https://www.intelligentliving.co/ai-choosing-best-interview-candidates-uk

[22] https://tcf.org/content/report/datafication-employment-surveillance-capitalism-shaping-workers-futures-without-knowledge/?agreed=1&agreed=1

> *"A new field of 'people analytics' has emerged, whereby software companies promise to surface the most qualified hires through psychological profiling based on thousands of data points related to where people live, their social media use, their personal relationships, and even which web browser they use. Each person's unique profile, when matched with data supplied by third-party brokers, adds up to a score. The score is matched against an established ideal by the hiring firm, and the closer the match, the more eligible the candidate is for hire."*

An example of this is 'talent screening' software Fama. This software can scan a prospective employee's social media feed and flag up potential problematic behaviour. This data is then used to decide whether to hire an individual.

In responses to our trade union reps survey, there was frequent reference to AI platforms offering a wide range of management functions also being used for recruitment purposes. One of these was SAP, an AI platform that provides an incredibly wide range of management services, including the recruitment process.[23]

Reps also referred to the Hireview platform, which offers a range of AI-powered assessments, including pre-interview assessment and video interview, with various forms of built-in analysis that has been reported to include facial analysis,[24] as well as gamified assessment.

Line management by AI

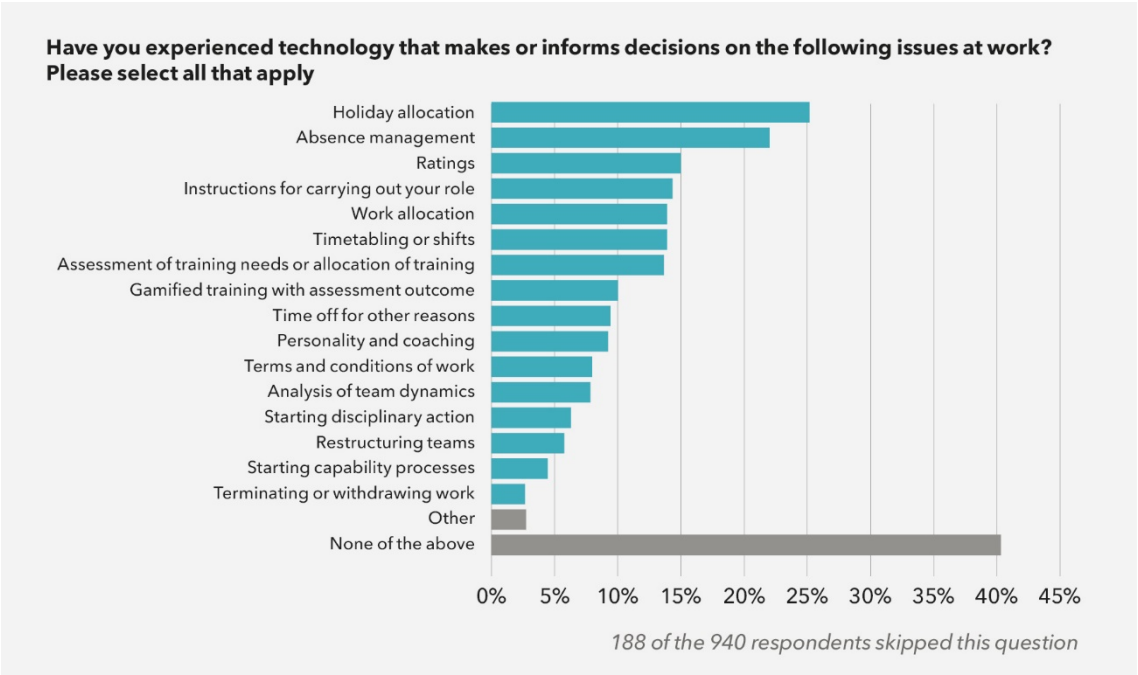
People are not only being recruited by AI, they are being line-managed by AI as well.

We asked workers whether they had experienced technology that made or informed decisions on a variety of issues at work.

As can be seen from the figure below, 10–25 per cent of respondents said they had experience of decision-making/informing technology in holiday allocation, absence management, ratings, role instructions, work allocation, timetabling, access to training and gamified training assessment.'

[23] https://www.sap.com/products/human-resources-hcm/workforce-planning-hr-analytics.html#planning
[24] https://www.ft.com/content/b24a7e9e-a1c1-11ea-b65d-489c67b0d85d

Figure 5: Experience of technology used in line management



We now explore workers' experience of some of these technologies in more detail.

Absence management

A relatively high number of worker respondents (22 per cent) to this survey question said they had experienced use of technology making or informing decisions about absence management.

Some workers suggested that they may be subjected to increased absence monitoring by AI systems during a capability process. For example, one worker strongly suspected that activity time and tasks were being monitored more than usual while she was under a 12-month sickness absence review as part of a capability process.

Others reported difficulties and unfairness when triggers for disciplinary or capability reviews were decided on by an AI system. For example, one worker described how a sickness absence review had been generated unfairly by automated software, failing to take into account the explanatory content of doctors' notes, and that certain absences had been authorised.

Another described how an automated system triggered a capability review, despite her absences having been to deal with a family emergency. She explained that the whole process had a negative impact on her mental health.

Work allocation, timetabling of shifts and time off

Quite a high number of workers we asked about technologies making or informing decisions had experienced AI-powered work allocation (14 per cent) and timetabling of shifts (14 per cent). The most common experience of all was in relation to technology making holiday allocation decisions (25 per cent), with time off for other reasons just under 10 per cent.

Workers and union reps referred to a variety of AI platforms they have experience of when work and time off is allocated and scheduled.

For example, workforce management company Legion, whose products include AI-powered tools to facilitate "demand forecasting, labour optimisation, auto scheduling, employee engagement and time and attendance". Its auto-scheduling function is intended to "auto-match business needs with employee preference" and "automatically generate compliant schedules".

Another example is RotaCloud, an AI platform that schedules shifts, records time and attendance, and manages annual leave. RotaCloud also offers a facility to calculate labour percentages and link this with work allocation schedules.[25]

There was also particular mention of the use of Afiniti in call centres.

Afiniti (https://www.afiniti.com/what-we-do/pairing-better) is an AI platform that uses AI to "identify subtle and valuable patterns in human behaviour to measurably increase enterprise profitability". Afiniti Enterprise Behavioural Pairing uses AI to "pair individuals on the basis of behaviour" and "discovers and predicts patterns of interpersonal behaviour to optimally pair customers with agents".

Our union reps suspected that Afiniti was being used to match callers with workers. Afiniti explains that in relation to pairing functions of this type, it looks at "all of the interactions from our client's databases and determine whether or not they were successful. We then analyse all of the contextual data that we have access to (eg demographic data, previous interactions, and any available internal analytics) and use algorithms we have developed to look for patterns which can in some way predict the outcomes (eg if a customer has had multiple unsuccessful calls with customer care, they are very likely to want to cancel)."

In relation to working with this type of system, a call centre worker explained:

> *"I sign in to a call allocation system that records when I log in and out, how many calls I take, how much time is spent speaking to [the] customer, [how long] customer on hold, after call work (recording notes on call etc.), break times."*

Another AI platform mentioned by trade union reps was SAP. The sheer breadth of the AI-powered services offered is impressive, ranging from "employee experience management" to core HR and payroll functions, to HR analytics and workforce planning.

SAP explains that with HR analytics and planning its platform can:

> *"Create a single version of the truth with standard definitions of workforce metrics... enabling managers and leaders to make better decisions based on a common understanding of the data".*

Many respondents to our worker survey highlighted that the functions offered by AI platforms often overlapped, applying to several different aspects of their job at once. For example, workers might be notified of deadlines and tasks by an online tool, which also tracked every piece of work completed and in addition, monitored "whether you are available/away/offline and when you were last active".

There was also evidence in the surveys of the use of apps to allocate work. One worker in health and social care told us:

> *"We have an app that asks us if we can be redeployed and where we are working and if we have any [coronavirus] symptoms."*

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[25] https://blog.rotacloud.com/labour-percentages

Ratings

The ranking of workers by platforms (often using points or stars) is a well-established practice and, on the face of it, the rankings are simply calculated on the basis of ratings given by previous customers.

However, there is often AI at work behind what are described by Tom Slee as "reputation systems" in *What's Yours is Mine: against the sharing economy* (2015). Slee also references the reputation algorithms that determine rankings.

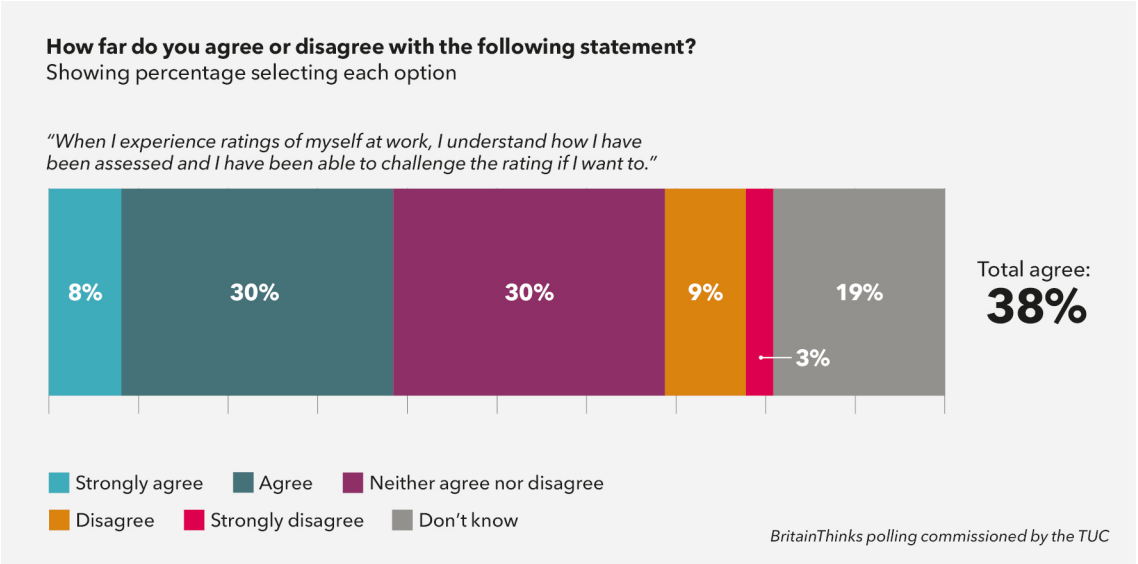
Our surveys and the BritainThinks polling both revealed the extent to which workers do not understand how their ratings have been calculated. Only 38 per cent of workers taking part in the BritainThinks polling agreed that when they experienced ratings of themselves at work, they understood how they had been assessed and have been able to challenge the rating (see Figure 6).

Prassl in *Humans as a Service* (p54) exposes how platform rating mechanisms, "rely on constant algorithmic monitoring to ensure tight control over every aspect of work and service delivery. Additional elements – from compliance with platform policies to how quickly and often a worker accepts new tasks – are factored into the equation, with any deviation sanctioned in real time."

The practice of ratings and reputation algorithms has now spread out beyond platform work and into the standard labour market.

The BritainThinks polling revealed that 18 per cent of respondents had experienced ratings from customers or clients, and 4 per cent had experienced automatically generated ratings using data held about them.

Figure 6: Experience of ratings



Our worker survey showed that 15 per cent of worker respondents to this question had experienced technology making or informing decisions about ratings.

Comments from workers in the TUC surveys about ratings revealed the extent to which the way ratings are calculated remained a mystery to them. There were also concerns and suspicions about how these ratings might then impact on their terms and conditions of work.

For example, one worker commented:

> *"I suspect that technology is used to calculate whether our annual performance ratings fit a normal distribution, and when they do not, this then results in managers being told a certain number of people have to be down-rated (the managers then have to choose people to down-rate). I have no proof of machine involvement though, other than that the system is done online."*

Another worker reported:

> *"Use of arbitrary quantitative thresholds in student feedback about teaching quality from satisfaction surveys. If your score, which is calculated down to the level of the individual, is below a certain 'traffic light' threshold, you are usually invited to a... meeting to discuss how you can 'improve'. The equality implications of this have been raised by the union with management but have so far been ignored."*

Role instructions

AI-powered tools that provide analytical goal setting and performance assessment are also increasingly common. For example, BetterWorks.

BetterWorks provides an AI-driven assessment of performance that is intended to replace the traditional human-led performance management review process.

The AI is informed by a 'work graph', which maps out how all roles, goals and targets are connected within an organisation. Assessment and intervention are constant as the analysis of performance takes place based on real-time data.

Out of the workers we asked about their experience of technologies making/informing decisions about them, 14 per cent said they had experienced technology of this type giving them instructions for carrying out their role.

A UNISON rep reported use of AI software called 'eg Work Manager',[26] which provides (among other management services) "real time work management" in the public sector.

This software has a performance management function and the rep reported workers being timed against a set average time for completion.

The process of evaluation is in real time, as a worker inserts information into the software as they complete work on their desktop. The problem highlighted by the rep is the assumption that every task will have a suitable average time for completion.

A BFAWU rep explained to us that:

> *"Technology is aiding employers with setting targets, like pick rates for example".*

Adler-Bell and Miller, in their report *The Datafication of Employment*[27] highlight how the logistics and health care sectors have introduced various productivity apps that manage workers' time spent on specific tasks and movement throughout their workspace. The goal is to direct someone through their workplace to optimise efficiency and nudge people to work harder.

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[26] https://www.verint.com/eg/our-solution/real-time-work-management.html
[27] https://tcf.org/content/report/datafication-employment-surveillance-capitalism-shaping-workers-futures-without-knowledge

Amazon is renowned for using new technologies to drive productivity, which inevitably leads to work intensification for the workforce. Sarah O'Connor in the *Financial Times*[28] highlighted how handheld satnav computers are used to give warehouse staff directions on where to walk next and what to pick up when they get there and also to measure a worker's productivity, the data then being fed back to the employer.

Former workers reported to the *FT* that the pressure is intense, describing handheld devices giving a real-time indication of whether they were running behind or ahead of their target and by how much, and that managers could also send text messages to these devices to tell workers to speed up.

Team dynamics and personality

Many of the AI platforms mentioned above also provide AI-powered tools to undertake analysis of team dynamics, personality analysis and coaching and restructuring of teams. Worker respondents to our question about this had experience of all three areas, with just under 10 per cent experiencing team dynamic analysis, just under 10 per cent personality analysis/coaching, and 6 per cent having experienced technology-led restructuring of teams.

Gamified training with assessed outcomes

Gamified training (the use of gaming mechanics and experience, often by way of a simulation) appears to be on the rise, with 10 per cent of workers responding to this question saying they had experience of gamified training and assessment.

A common theme in responses to our surveys was the extent to which online training is a very poor substitute for person-to-person training. One worker said:

> *"Quality training has been replaced with online learning because it is inconvenient and expensive for the employer to do it properly."*

Workers also recounted to us various problems with access to online training, with one worker explaining:

> *"I work with a colleague who is blind and is unable to access any training materials online."*

Discipline and dismissal

It is common practice in platform work for "low ratings to trigger a series of 'performance standard probations', with workers confined to low-value tasks – or simply fired ('terminated')".[29]

A union rep reported to us that they had experienced scoring systems for redundancy selection being deployed, with software making the selections and no human intervention at all.

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[28] https://www.ft.com/content/ed6a985c-70bd-11e2-85d0-00144feab49a

[29] Prassl, *Humans as a Service*, p61, with reference to the TaskRabbit handbook, community guidelines and other sources.

There have been numerous reports in the media of the use of automated processes to track and then fire people for productivity reasons, as well as reports of human error leading to AI systems making unfair decisions to dismiss.[30]

Out of the workers we asked about technologies of this type, 6 per cent had experienced technology informing or making a decision to start a disciplinary process, just under 5 per cent to start a capability process and 3 per cent had experienced this type of technology terminating or withdrawing their work.

Monitored by AI

There is a trend towards the monitoring of worker behaviour for the purposes of collecting data that can then be analysed by AI. This has transformed monitoring tools into data sources. Once this data is accumulated, it is often then AI processed to reach conclusions and decisions about workers.

According to CIPD,[31] it is commonplace for HR professionals to use people data to tackle significant challenges their organisations are facing. A CIPD survey found that 75 per cent of HR professionals globally are tackling workforce performance and productivity issues using people data, illustrating the importance of this information for strategic workforce issues.

Some workers expressed concern that AI platforms ostensibly used for carrying out a role, such as teaching or counselling, might also be being used for performance monitoring.

Platforms of this type referred to by workers included Century, Canvas and Iaptus. One worker observed:

> *"The fact is that we don't know how much the surveillance capabilities are used."*

Another AI platform mentioned by workers was CORE. On the face of it, this is simply a collection of open-access research papers, but a worker reported it as in their experience being used "for continuous assessment of performance".

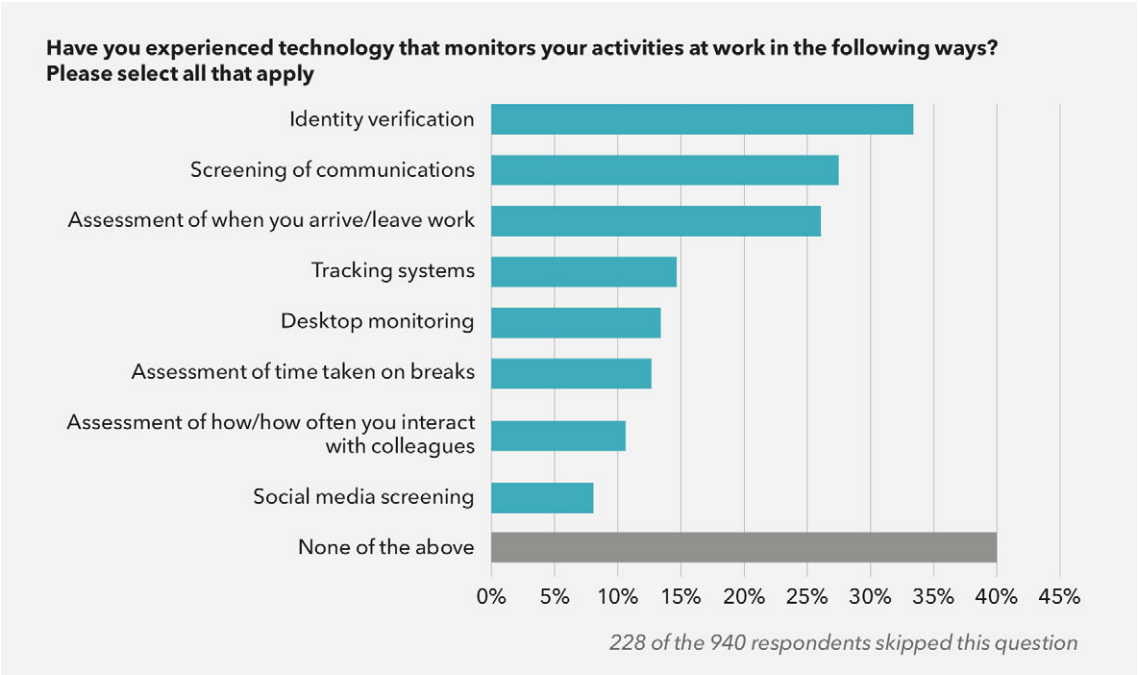
We now look at some specific types of monitoring being experienced at work.

Productivity and performance monitoring

It is clear from the results of both TUC research and BritainThinks polling that monitoring by employers for a variety of productivity and performance management purposes is fairly common (see Figure 7 below).

[30] https://www.bbc.co.uk/news/technology-44561838
[31] https://www.cipd.co.uk/Images/people-analytics-executive-summary_tcm18-43748.pdf

Figure 7: Experience of technology that monitors productivity and performance



Screening of communications and desktop monitoring

Figure 7, above, shows that 27 per cent of workers surveyed had their communications screened, 13 per cent had experienced desktop monitoring, and 8 per cent social media screening.

These findings were broadly supported by the BritainThinks polling, which revealed that 20 per cent had experienced monitoring of their devices (for example for emails, browser history and typing), 11 per cent had calls monitored and 10 per cent had their social media activities outside work monitored (Figure 8).

Many workers responding to open box questions in our survey reported monitoring of their activities while working remotely. This included monitoring of emails, internet use, personal phone calls, slack use, work start and end times, key logging, Skype for Business status monitoring and use of Microsoft MyAnalytics, as well as monitoring by Jira, an AI company that provides products and apps for assigning, tracking, reporting and managing work.[32]

A Unite rep told us:

> *"Our company uses algorithms to look at all communications."*

Another worker explained how Microsoft Outlook analysis of weekly behaviour (MyAnalytics) had been categorising 'available to focus' vs 'collaboration time', measuring the time spent emailing or not. They highlighted that this monitoring ignored the other tasks undertaken by staff such as meetings and preparation, and that it was not clear if this information was available to management for performance measures.

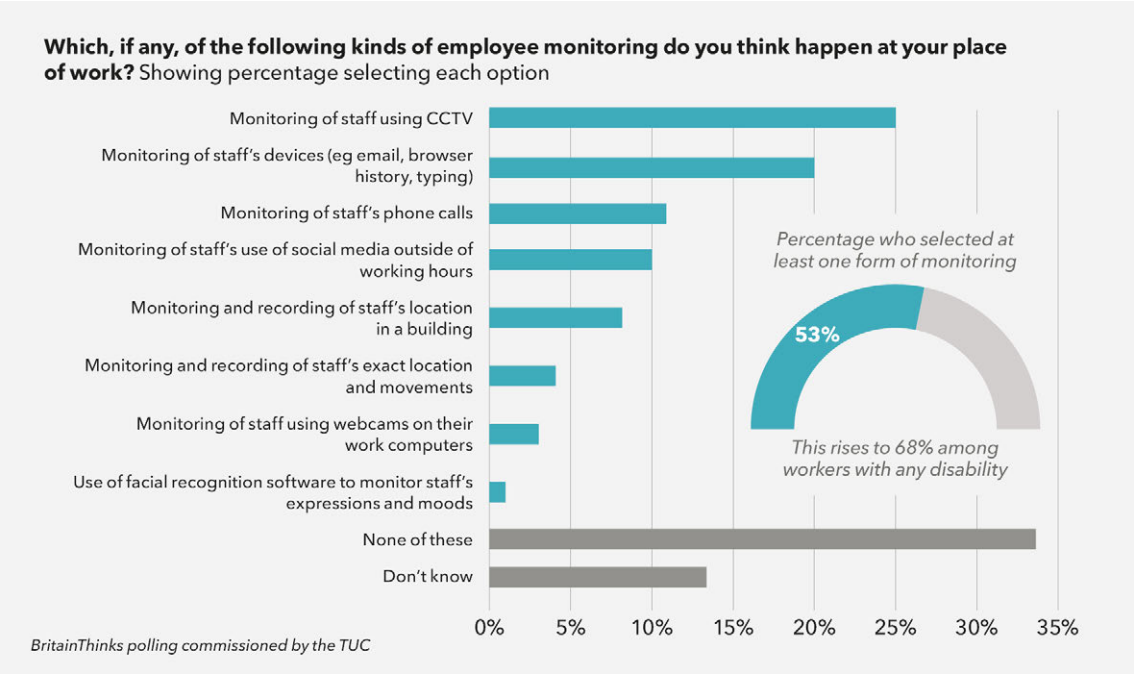
Other examples of screening software include the Worksmart 'productivity tool'. This can be used by managers who have staff working remotely. It logs the hours staff work, counts the number of keyboard strokes made in an hour, records social media usage, and takes photographic 'timecards' every 10 minutes via a webcam.

[32] https://www.atlassian.com/software/jira/guides/getting-started/overview

Teramind software uses a live analytics dashboard and livestreams of employee desktops to monitor everything from productivity to file transfers and instant messages, with a feature that also allows managers to record activity and play it back later.

Recent YouGov polling commissioned by Prospect[33] revealed the extent to which workers are uncomfortable with monitoring and surveillance while they are remote working, with 66 per cent being uncomfortable with keystroke monitoring and 75 per cent uncomfortable with use of algorithms.

Figure 8: Monitoring at work



Working time

Respondents to our monitoring question had also experienced use of technologies to assess when they arrived and left work (26 per cent) and the amount of time taken on breaks (13 per cent).

Workers expressed concern about informal monitoring that seemed to be taking place through the display of login and logout on numerous platforms, apps and video conferencing platforms.

Employers can purchase time-tracking software that makes use of desktop screenshots, along with other functions such as timesheets and payments. For example, Hubstaff offers employers the ability to "know each of your team members' activity rates and even take optional screenshots to see work as it unfolds". The BBC recently reported that US-based Hubstaff says its number of UK customers is up four times year-on-year since February 2020.[34]

These technologies, along with those referred to above that collect data for the purposes of productivity and performance management, clearly have capability to collate information on working time. A respondent to our worker survey raised the possibility that this technology

[33] https://prospect.org.uk/news/workers-are-not-prepared-for-the-future-of-working-from-home
[34] https://www.bbc.co.uk/news/business-54289152

could be used not only to check whether workers are fulfilling their obligations but also to check that regulations imposing working time limits are not breached by employers.

Behaviour

Technologies are also being used by employers to monitor and assess the behaviour, personal qualities and characteristics of workers. When asked about their experience of monitoring, 11 per cent of our worker respondents had experienced technology making assessment of how/how often they interacted with colleagues.

Some employers have been reported in the press as using biometric name badges (with biometric data such as fingerprints, retina and iris patterns, voice waves and DNA) to gather data about their workers. These badges are equipped with radio-frequency identification devices and microphones and enable employers to collect data such as how much time a worker spends talking, how loudly they speak and their tone of voice, and even the extent to which someone dominates conversations.[35]

A UCU trade union representative reported to us that teaching staff were being asked to produce pre-recorded teaching sessions. These were then used to monitor performance, measuring metrics through the platforms on which the recordings were stored.

Although the BritainThinks polling suggests that only a very small percentage of people have experienced the use of FRT to monitor factors such as mood and facial expressions (1 per cent), this may be more common than people realise.

The BritainThinks polling reveals that use of CCTV is by far the most common experience of monitoring at work (25 per cent). A very common theme that emerged from our worker survey was the concern workers felt about CCTV images being inappropriately used for performance and productivity management when the original agreed function was security.

There is also software available to employers that will allow employers to take photos of workers through their computer cameras. One company providing this function is Sneek, who says that its software, "Lets you see your team mates all day and start instant video chats with a single click" (https://sneek.io).

Reinforcing our findings relating to the concern workers have about camera monitoring, trade union Prospect recently commissioned YouGov polling that showed 80 per cent of workers would be uncomfortable with camera monitoring, and 64 per cent would be very uncomfortable.[36]

Location

There is evidence to suggest that tracking systems are used by employers to collect location-based data that can be used for performance and productivity management purposes.

When asked about monitoring, 15 per cent of our worker survey respondents said they had experienced tracking devices.

Location-based data can be obtained from GPS devices or tracker devices such as wristbands. Some employers have used motion-tracking software such as OccupEye, which can record when and for how long someone is away from their place of work.

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[35] https://www.techworld.com/startups/us-startup-humanyze-is-bringing-its-employee-tracking-badges-uk-3653590

[36] https://prospect.org.uk/news/workers-are-not-prepared-for-the-future-of-working-from-home

The National Union of Journalists stopped the *Daily Telegraph* from using this form of surveillance and subsequent processing of workforce location data.[37]

In this case, journalists at the *Telegraph* found devices installed under their desks, equipped with heat and motion sensors. The location data processed by the devices enabled the employer to see how long people spent at their desk.

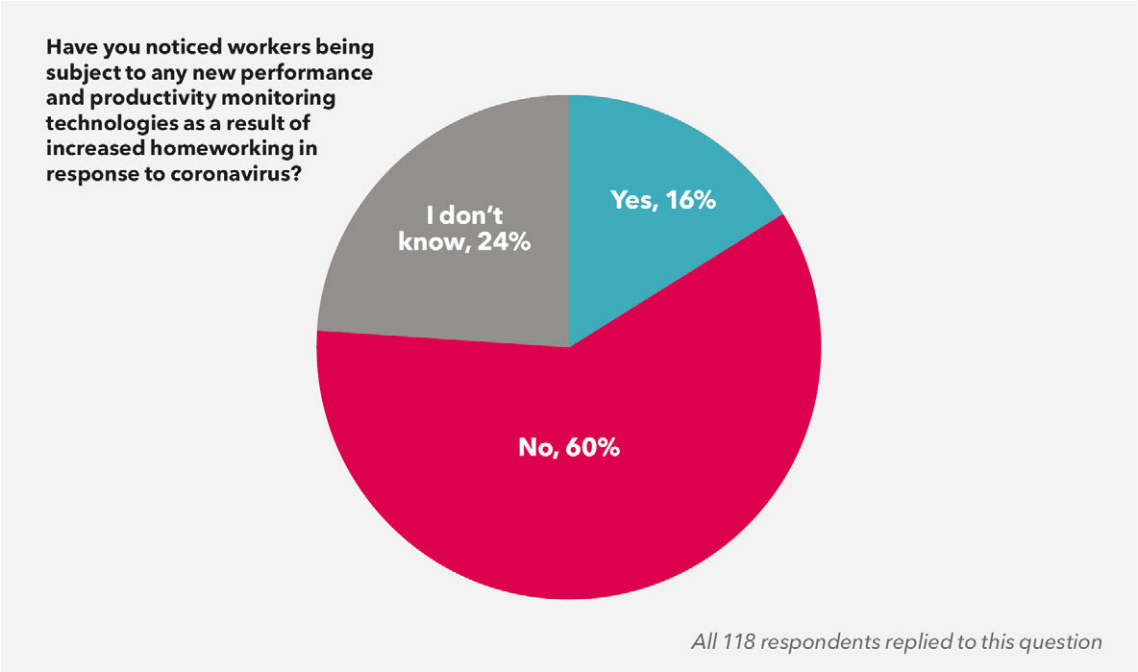
The YouGov polling commissioned by Prospect also revealed that 74 per cent of workers were uncomfortable with electronic tracking on wearable devices.[38]

Coronavirus and homeworking

A small but significant number of reps told us that they'd noticed workers being subjected to new monitoring technologies as a result of the increase in homeworking brought about by the pandemic, with about a quarter simply not being sure.

Figure 9 shows that 16 per cent of union reps who responded to this question told us they have noticed workers being subject to new performance and productivity monitoring technologies, such as keyboard monitoring tools, as a result of increased home working.

Figure 9: Monitoring and homeworking



The BritainThinks polling supported this finding, with 15 per cent of respondents agreeing that monitoring and surveillance had increased since coronavirus.

The ETUC recently investigated its affiliate European trade unions' experience of coronavirus-related surveillance of workers and reported on this in a Covid-19 watch briefing, 'New technologies allowing more surveillance at work'.[39]

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[37] https://www.theguardian.com/media/2016/jan/11/daily-telegraph-to-withdraw-devices-monitoring-time-at-desk-after-criticism
[38] https://prospect.org.uk/news/workers-are-not-prepared-for-the-future-of-working-from-home
[39] https://www.etuc.org/sites/default/files/publication/file/2020-10/20200930_covid-19%20Briefing%20on%20surveliance%20technologies%20%28002%29.pdf

It concluded that:

> *"Trade unions are worried that the current trends of surveillance and datafication could mean that Covid-19 data of today is at risk of being used for much more punitive and negative purposes by employers and that that the data will continue being used for such aims once the emergency is over."*

Health monitoring

Health monitoring by AI was well established before the coronavirus pandemic, but there has been widespread reporting of a boom in health monitoring and surveillance with new coronavirus-related monitoring technologies.[40]

In terms of general health monitoring, many employers offer wellbeing applications, such as Fitbits or sleep trackers, with employees voluntarily sharing data about their exercise, eating, fitness and sleeping habits.

As City AM reported,[41] "With workplace absence now more likely to be caused by stress, anxiety, or lack of proper sleep than traditional musculoskeletal problems, devices that can aggregate and then determine the overall health (and potential health risks) of an organisation provide powerful data points."

At insurer Aetna employees can boost their bonuses if their sleep tracker data shows that they attain the right amount of rest each night over a certain period. Other employers are linking rewards with physical exercise. Without proper safeguards, a worker's sensitive personal health-related data could be used to decide how their career progresses or how much they will earn.

We asked workers to tell us whether they had experienced various types of health-related technologies at work (see Figure 10). These included new technologies associated with the coronavirus pandemic.

By far the greatest level of experience appeared to be in relation to health-related apps downloaded on to phones, with nearly 20 per cent saying they had experienced apps of this type (10 per cent on personal phones and just under 10 per cent on work phones).

Experience of other types of health technologies appears generally low among our worker survey respondents, with only around 1–2 per cent of those answering this question having experienced contact-tracing tools, social distancing tools – including apps, wearables and cameras, breathing monitors, wearable chips, hygiene tracking devices – for instance to monitor handwashing or WC visits and profiling software to predict state of health.

However, given the nature of coronavirus, there is a strong possibility that sector-specific surveys would reveal hugely varying results. For example, while some of these technologies are unlikely to be experienced by professional workers able to work at home throughout the pandemic, other workers such as those in health and social care, food production and delivery, hospitality etc. may have used these technologies far more.

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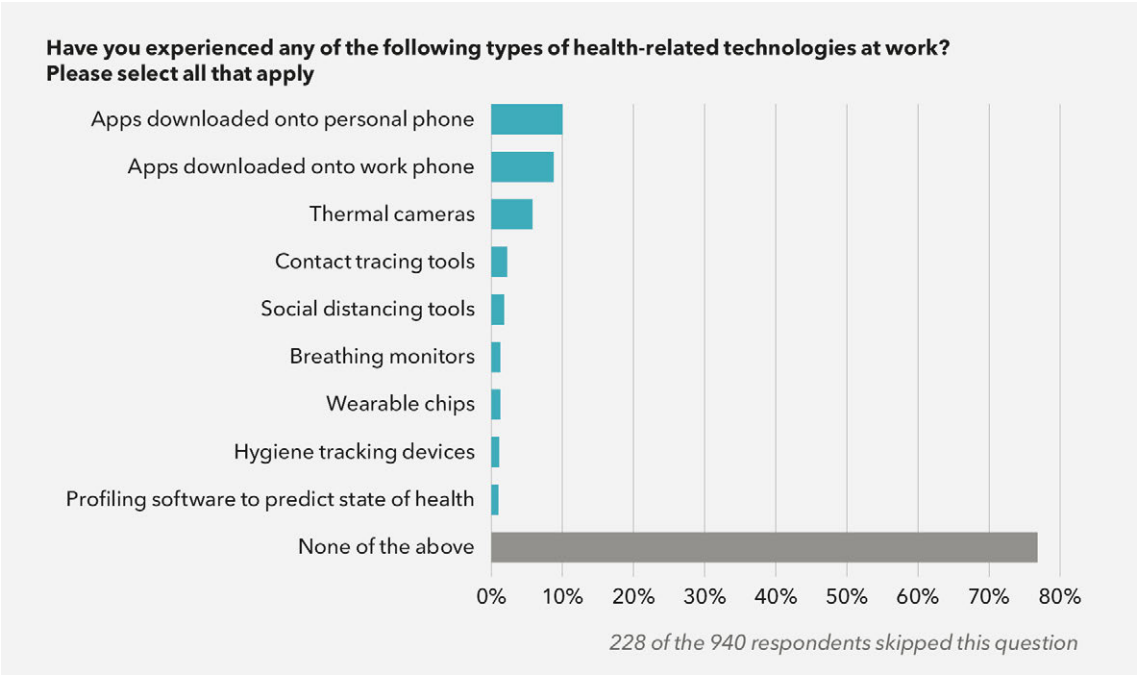
[40] https://www.wired.co.uk/article/coronavirus-work-office-surveillance and https://slate.com/technology/2020/05/workplace-surveillance-apps-coronavirus.html

[41] https://www.cityam.com/employers-want-use-wearable-tech-track-health-sleep-fitness

Figure 10: Health technologies



In its recent Covid-19 Watch briefing note on new technologies allowing more surveillance at work,[42] the ETUC outlines reports received from Belgian trade union ACLVB about how:

> *"Different companies have been running 'tests' with smart wristbands using GPS and Bluetooth technology to enforce social distancing and perform contact tracking. Thermal imaging technology has been implemented in some workplaces. The national data protection authority and the labour inspection authority have spoken out against these practices. The union has also received several questions from its members regarding employers who ask teleworkers to access to their webcams to monitor their activity. In one case, this request was framed by the employer as a measure to monitor safe working conditions."*

A Unite rep recounted to us that *"heat cameras were used at the site entrance to test for high body temp during this period of pandemic"* and 6 per cent of workers responding to our health question said they had experienced thermal cameras.

Workers also expressed their concern about automated assessments being made of their Covid risk level and what the implications of this may be. One worker explained to us:

> *"I was recently asked to complete a self-assessment risk Google form to return to work in September. Part of the assessment included calculating a 'Covid age' based on variables such as gender, age, and ethnicity. This Covid age was calculated automatically through a pre-set spreadsheet. I am not sure how this is calculated, and I think this does not take into account many other individual variables that make a person vulnerable. This process might enhance already existing inequalities in the workplace."*

[42] https://www.etuc.org/sites/default/files/publication/file/2020-10/20200930_covid-19%20Briefing%20on%20surveliance%20technologies%20%28002%29.pdf

IndustriALL, the global union representing workers in the mining, energy and manufacturing sectors, highlights the risks of profiling, particularly where employers process health-related personal data and predict the likelihood of an employee developing an illness.[43]

AI managing collective action

As well as being deployed to carry out the above management functions, another area of the employment relationship in which AI is exerting influence is collective action and union representation.

There is evidence from the US that pre-employment screening software and the data it generates is being used to discriminate against applicants who would be more likely to become trade union activists.

Nathan Newman, Information Law Institute, New York University, highlights the risks to unions and the workforce that pre-employment data processing can create:

"A first key part of the information advantage for employers is ensuring through pre-employment tests that the strongest agitators for organizing a union never get hired."

As employers strengthen their knowledge and control of information flows in the workplace, especially knowing what kinds of leaders might support an organizing drive and avoiding hiring them or quietly getting rid of them, this inevitably comes at the expense of worker collective power".

The use of employee survey data to supress union activity has also been highlighted in the media.[44]

In this article, journalist Sarah Kessler writes about a former HR manager reporting that:

"As early as the 2000s, Amazon began tracking the potential for unionization at each of its warehouses, building a heat map in Excel to identify 'hot spots' in its fulfilment network... This calculation was based on at least dozens of metrics, including employee survey data, timing of the last pay raise, the safety record of the facility, and even the financial strength of local unions."

American author Barbara Ehrenreich wrote about pre-employment screening tests in her *Nickeled and Dimed*. As part of the interview process for a housecleaning job she was "given something called the 'Accutrac personality test,' which asks questions such as whether you agree that 'management and employees will always be in conflict because they have totally different sets of goals'". She feared the answers given to this question, and others like these, were used to weed out candidates who may be inclined to join and become active in trade unions.

The possible use of Facebook 'Workplace' by businesses to monitor and supress union-related content was widely reported in summer 2020.[45]

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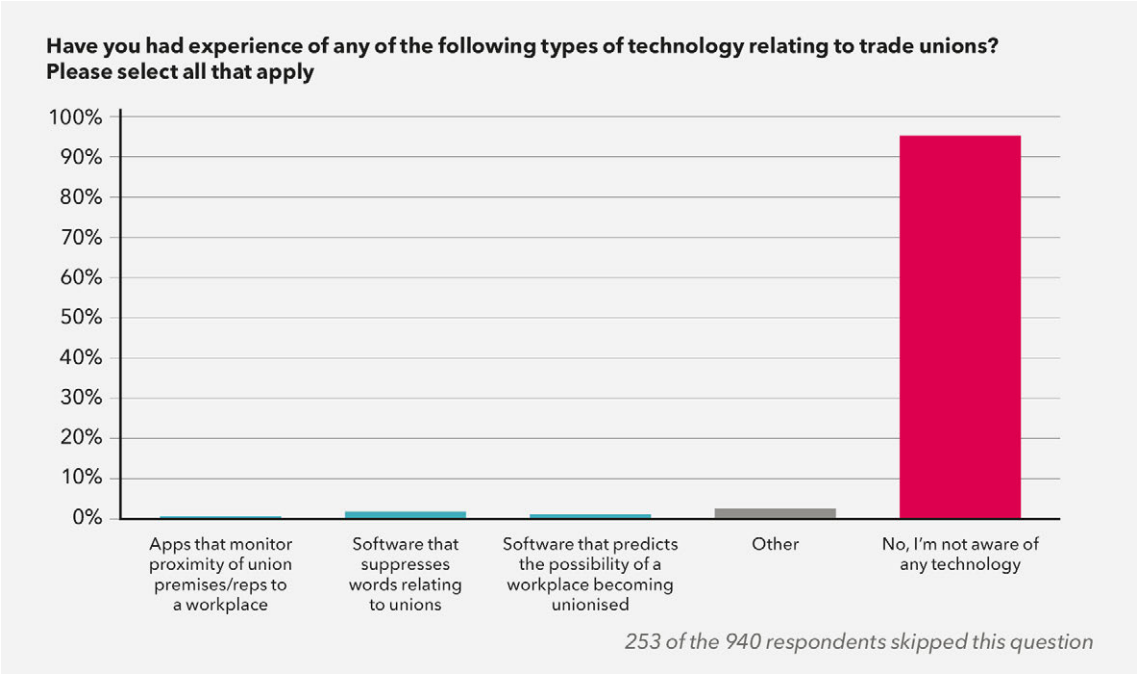
[43] https://news.industriall-europe.eu/content/documents/upload/2019/2/636849754506900075_Policy%20Brief%20-%20Artificial%20Intelligence.pdf

[44] https://onezero.medium.com/companies-are-using-employee-survey-data-to-predict-and-squash-union-organizing-a7e28a8c2158

[45] https://theintercept.com/2020/06/11/facebook-workplace-unionize/?utm_campaign=theintercept&utm_source=twitter&utm_medium=social

However, the vast majority of workers and trade union reps who responded to our survey question about union suppression were not aware of employers using technology to monitor union activity.

Figure 11: Technology to monitor union activity

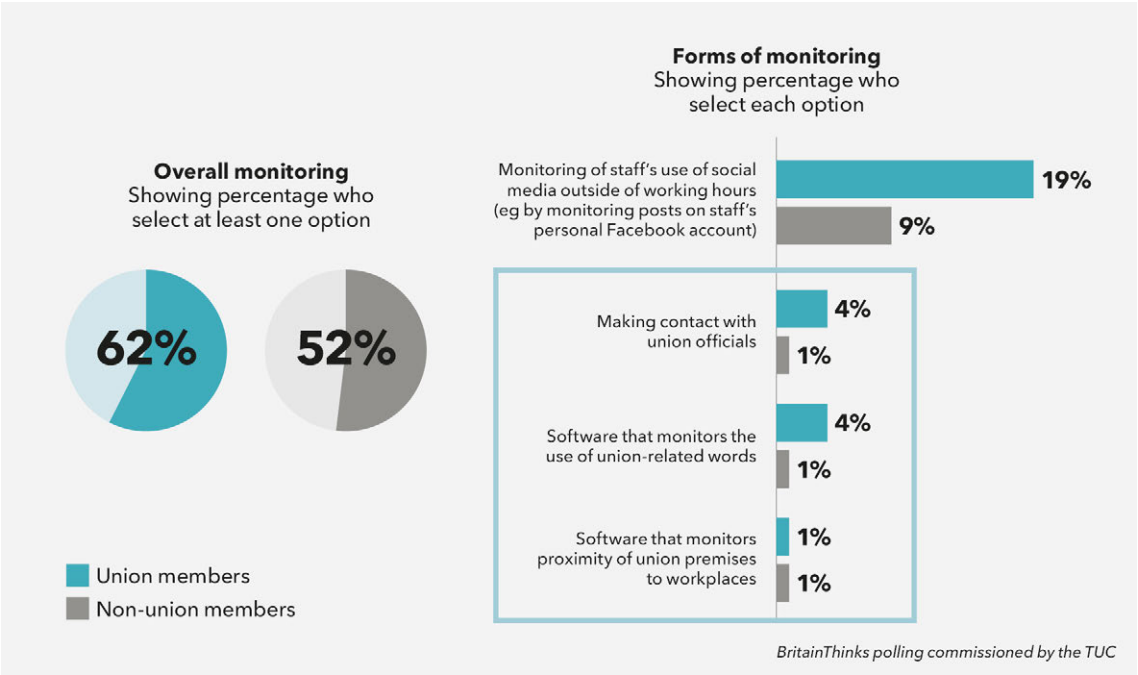


Of the three respondents who said they were aware of it:

- One mentioned not being aware of it happening but said it would be possible.
- One believed the employer monitors all their emails.
- Another felt that their employer used technology to bypass the possibility of union involvement and consultation, as well as to avoid to the workplace being unionised.

The BritainThinks polling (Figure 12) also revealed a low level of experience of software monitoring use of union-related words (4 per cent union members, 1 per cent non-union) and software monitoring the proximity of union premises to workplaces (1 per cent union member, 1 per cent non-union), and monitoring contact with union officials (4 per cent union member, 1 per cent non-union member). The analysis revealed that union members were more likely to perceive or experience union-related monitoring, suggesting that targeting of union members may well be taking place, albeit at a low level.

Figure 12: Perception or experience of monitoring – union members



Section 4

The implications for working people

Having explored the experience of workers in relation to specific AI technologies used at different stages of the employment relationship, in this section of our report we identify themes in the implications for workers of the use of these technologies.

We conclude each theme with a series of objectives for workers and trade unions. These objectives are then brought together and summarised in the final section of our report.

The themes emerged from the worker and trade union rep accounts of their lived, working experience of AI systems.

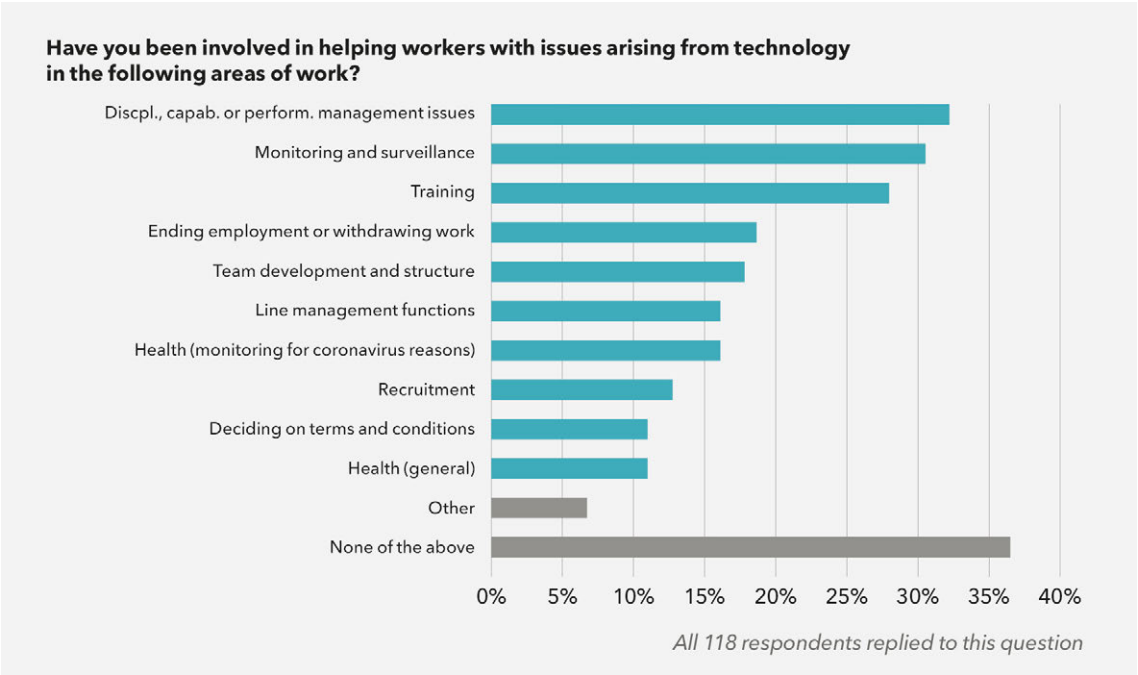
These include: the need for greater consultation and collective voice; transparency, consent and trust; the importance and value of data; the danger of discrimination and unfairness; difficulties in challenging decisions made by AI; threats to privacy and to worker wellbeing; a link between AI and insecure work; and the opportunity to use AI to further worker and trade union interests.

This graphic shows the results from a ThoughtExchange survey carried out by Prospect in advance of its Congress 2020 fringe meeting Taming the Algorithm.

Prospect asked what union priorities should be in order to strengthen workers' rights over data and new technology at work. Its graphic helpfully illustrates the wide range of issues for trade unions when representing their members in relation to AI and data.

Our research suggests that trade union reps experience a variety of issues arising from the use of technology at work (see Figure 13) with 64 per cent of respondents to this question having helped workers with such issues in at least one of the areas listed below.

Figure 13: Helping workers with issues arising from technology



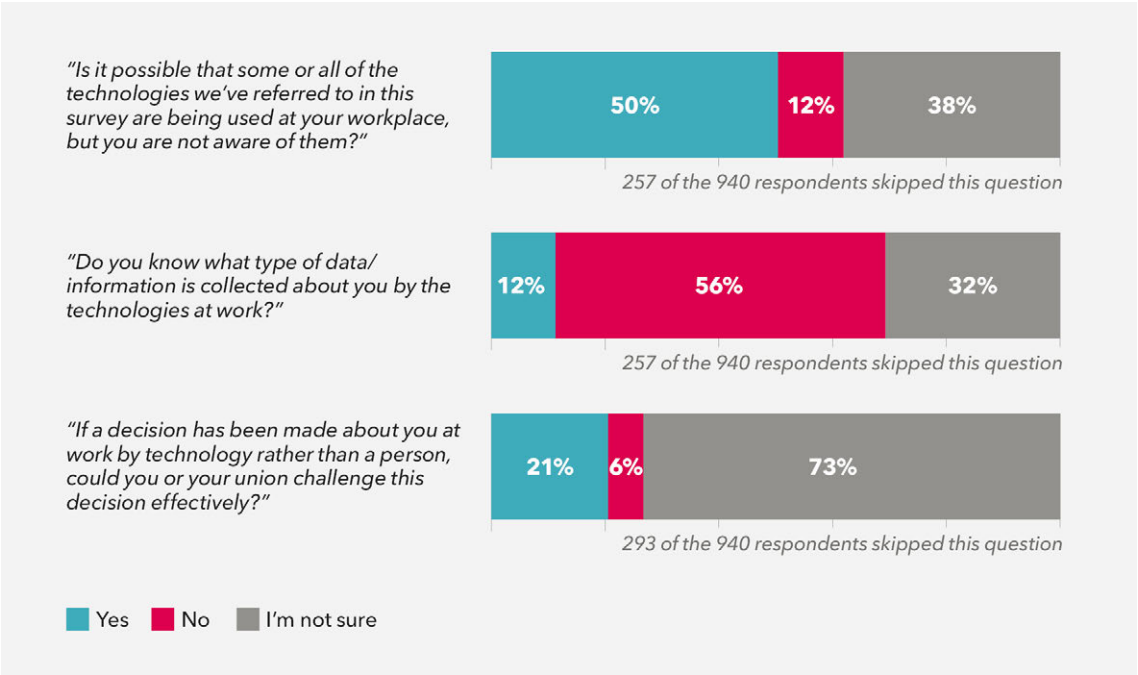
Transparency and consent

Workers and trade union reps responding to our surveys expressed a desire for employers to be more transparent about the technologies being used, and how they work.

Without this transparency, workers and union reps feared they would be unable to understand or challenge decisions made about them by AI.

About half of respondents to these questions agreed it was possible that AI-powered technologies were being used at their workplace, but they simply weren't aware of this, and only around 20 per cent agreed they could effectively challenge decisions made by technology (Figure 14).

Figure 14: Awareness of technologies, data, and the ability to challenge



A CWU rep described the use of "mysterious algorithms" by a call centre employer who wouldn't explain how these worked.

The global union IndustriALL has highlighted that a problem with machine-learning systems is that there is no explanation or justification for decisions and recommendations, and that machine-learning systems are a complete 'black box'.[46]

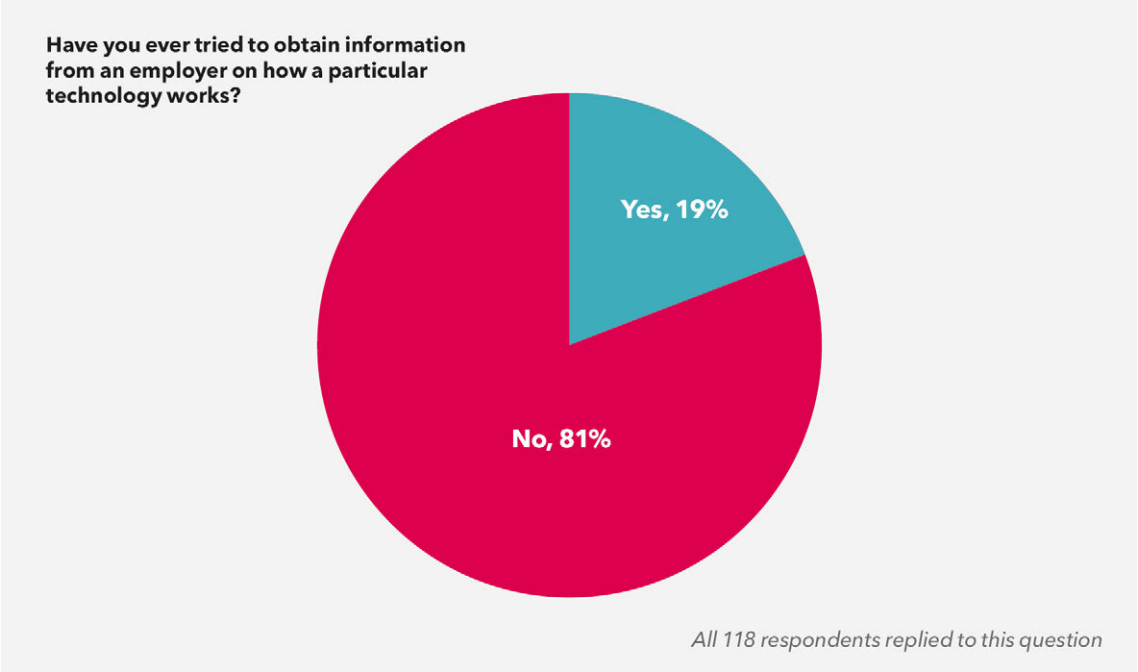
However, the problem of transparency is not necessarily one sided. In order to see whether information is available, the first step must be to ask for the information.

When asked whether they had tried to obtain information from an employer on how a particular technology worked, 81 per cent of union reps responding to the question said they had not (Figure 15).

This may be for a variety of reasons, including perhaps not knowing what type of information to ask for, which may not be obvious to someone without technical knowledge of AI systems.

[46] https://www.eesc.europa.eu/sites/default/files/files/industriall_-_artificial_intelligence.pdf

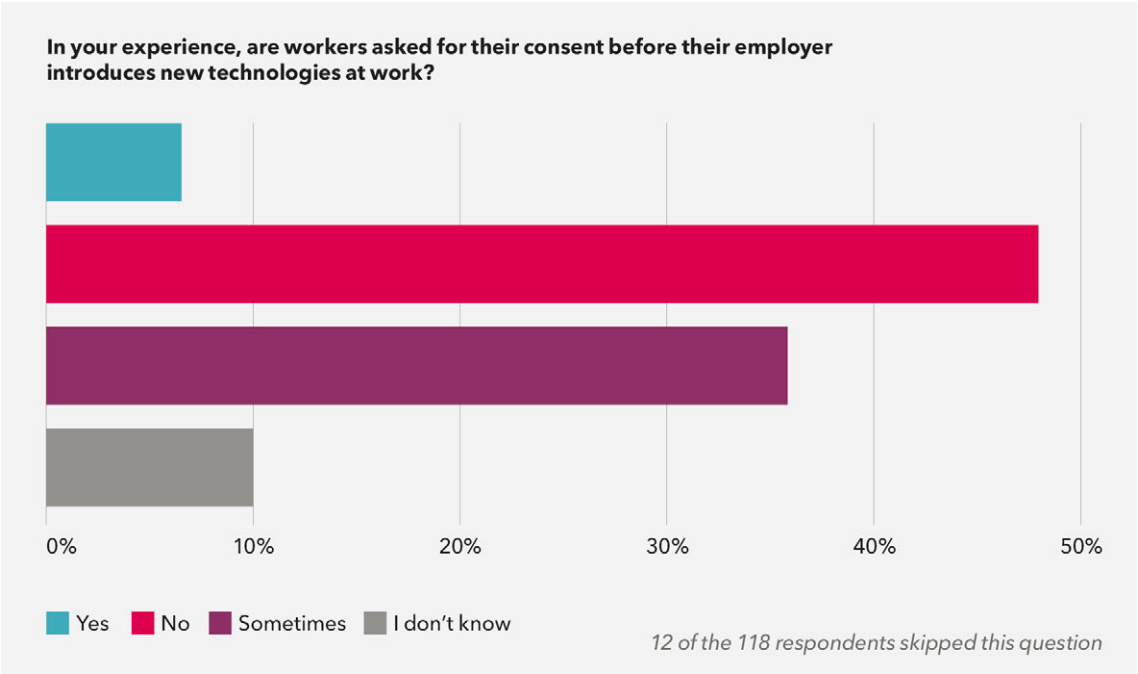
Figure 15: Accessing information on how technologies work



Connected to transparency is the issue of consent. When workers are not asked for their consent before AI technologies are used to manage them, they are less likely to be aware of when and how the technology is being used. They are also less likely to influence this process.

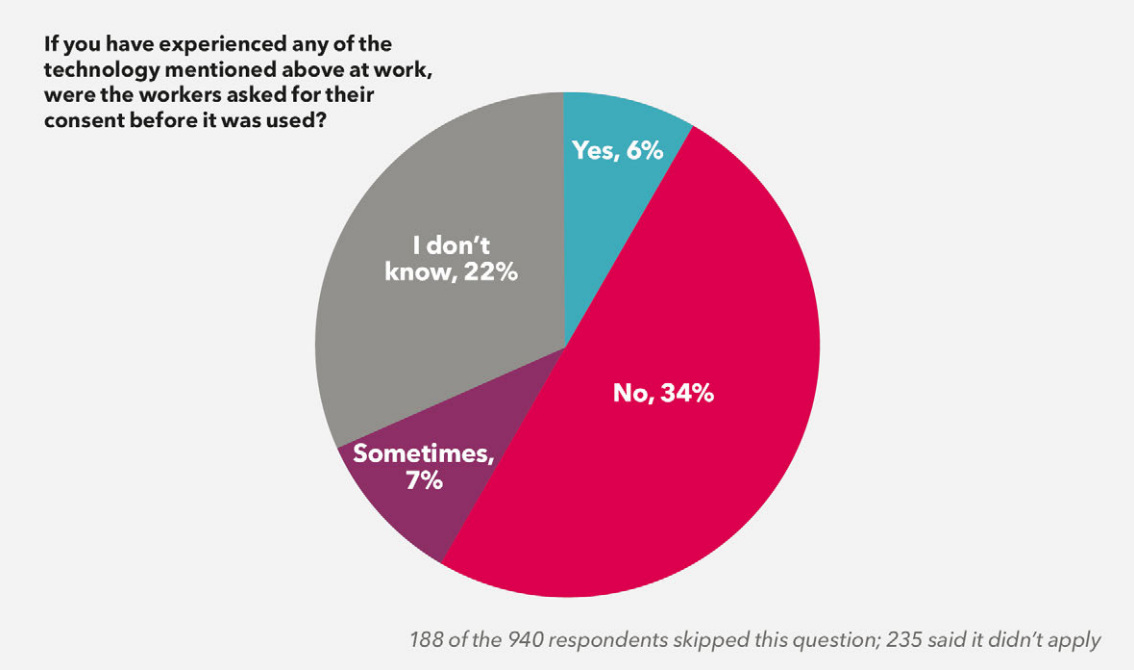
Around half (48 per cent) of union reps who responded to our question about worker consent told us that, in their experience, workers are not asked for their consent before their employer introduces new technologies at work. Only 7 per cent said this happened, with 36 per cent saying it sometimes does (see Figure 16).

Figure 16: Consent and new technologies



When workers were asked by us if they had been asked for their consent before the use of recruitment and management technologies mentioned in the first part of the survey, only 6 per cent said they had been.

Figure 17: Consent on recruitment/management technologies



We then tried to explore the extent to which people who answered 'yes' or 'sometimes' to this question felt their consent had been freely given. A significant percentage thought they could not freely give consent (47 per cent).

One worker explained to use that they felt they had no choice but to agree to an app downloaded on to their personal phone (a new requirement for two-factor authentication) as it was impossible to do their job without downloading the app. They concluded "consent was forced".

Another worker described the use of a software system to monitor engagement in discussions, monitor staff and analyse student activity on the intranet. They said:

> *"Terms of agreement are signed away automatically when entering the system – to deny access to your data means not having access to your job. No negotiation was held with staff regarding the changeover to this software programme."*

Objectives

In relation to the issues of transparency and consent, we have identified these key objectives for workers and trade unions:

- Obtain accessible and understandable information on how AI technology works, and also on how worker data is used to inform AI-powered tools, and across AI platforms.
- Increase worker awareness of when AI is operating and ensure consent is obtained where appropriate.
- Ensure that we work with and learn from international partners and take into account how international relations and trade deals may impact on data control and transparency.

Consultation

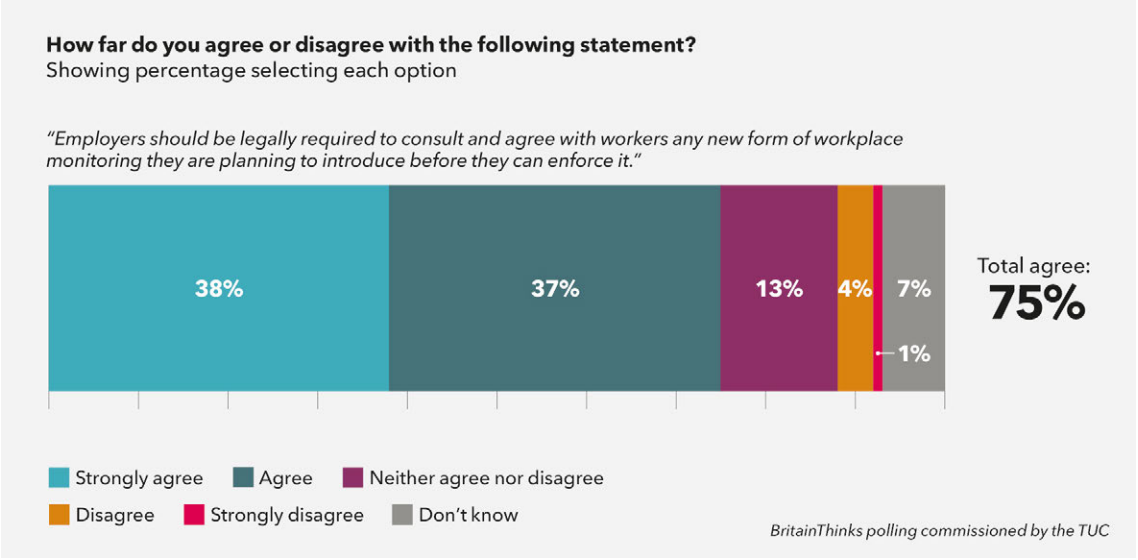
There is extremely strong support among workers and trade union reps for greater consultation of workers in relation to the introduction of new technologies at work. Without this, workers are left with little or no influence over when and how AI is used at work.

One TSSA rep said:

> *"Organisations need to be more open and honest and consultative."*

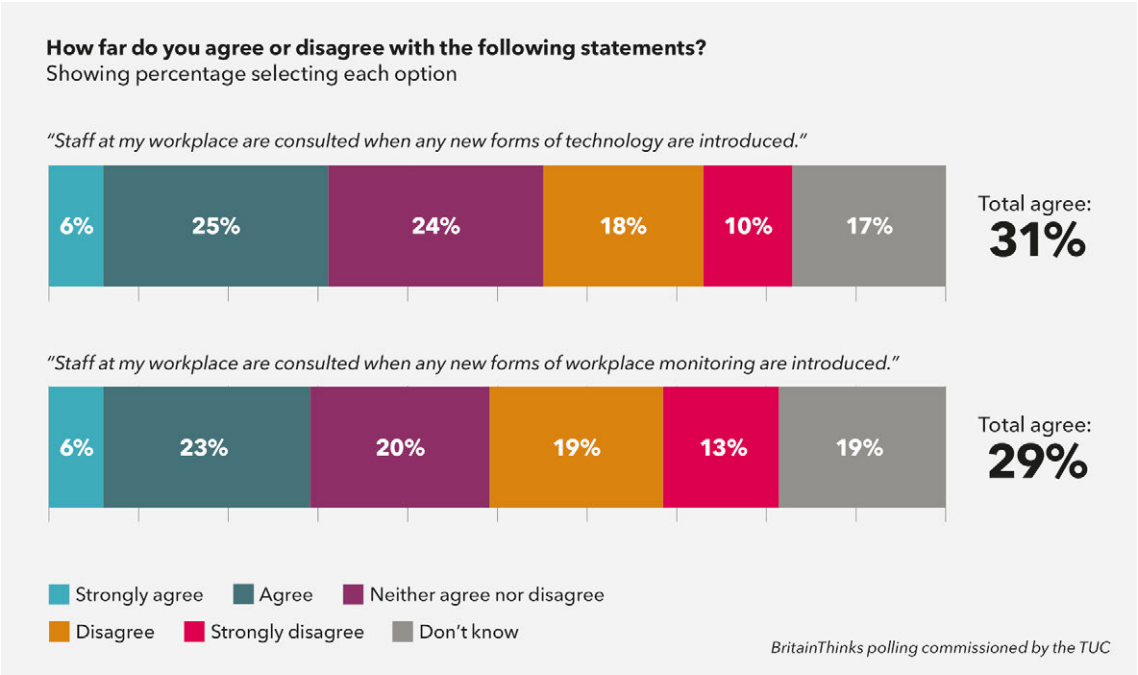
The BritainThinks polling revealed that the vast majority of workers (75 per cent) agree that employers should be legally required to consult and agree with workers any form of new monitoring they are planning to introduce before they can enforce it (see Figure 18).

Figure 18: Legal requirement to consult



Only 31 per cent of the respondents to the BritainThinks polling agreed that staff at their workplace were consulted when new technologies were introduced at work (Figure 19) and only 29 per cent agreed staff were consulted when new forms of workplace monitoring were introduced.

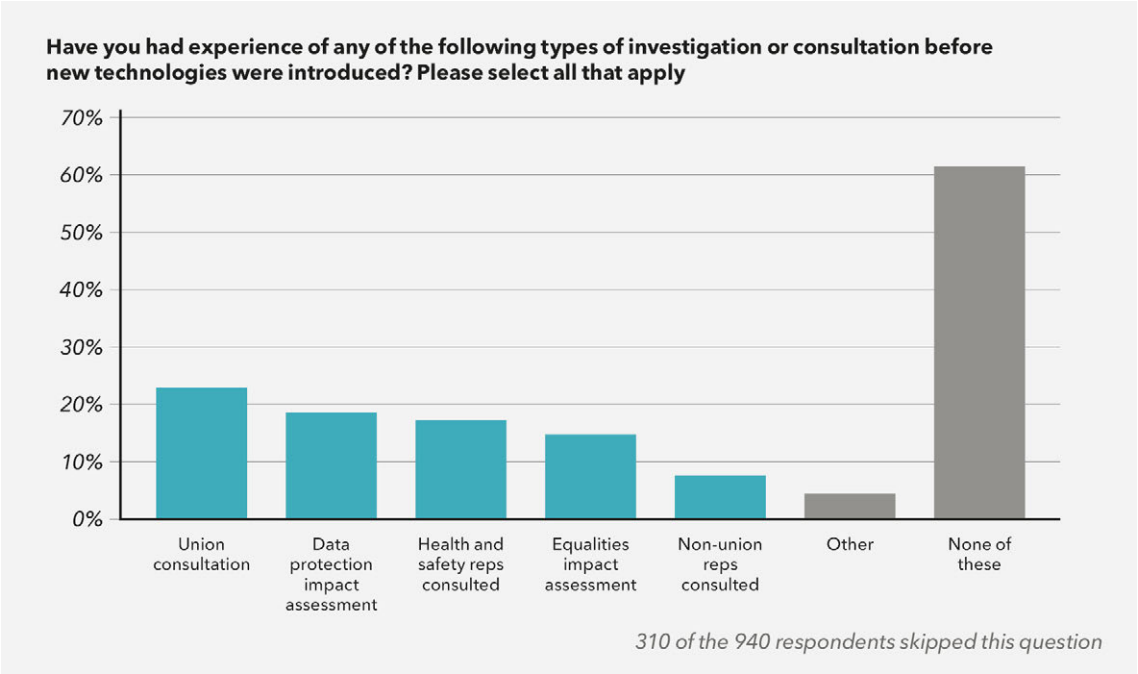
Figure 19: Worker experience of consultation



Many of the implications for workers of the use of AI to manage people are collective issues. There are not just implications for individuals. For example, when an algorithm makes decisions with a discriminatory outcome, this will in all likelihood affect large numbers of workers at once.

As Figure 20 shows, workers appear currently to experience a very low level of investigation or consultation before new technologies are introduced.

Figure 20: Consultation before introduction – workers



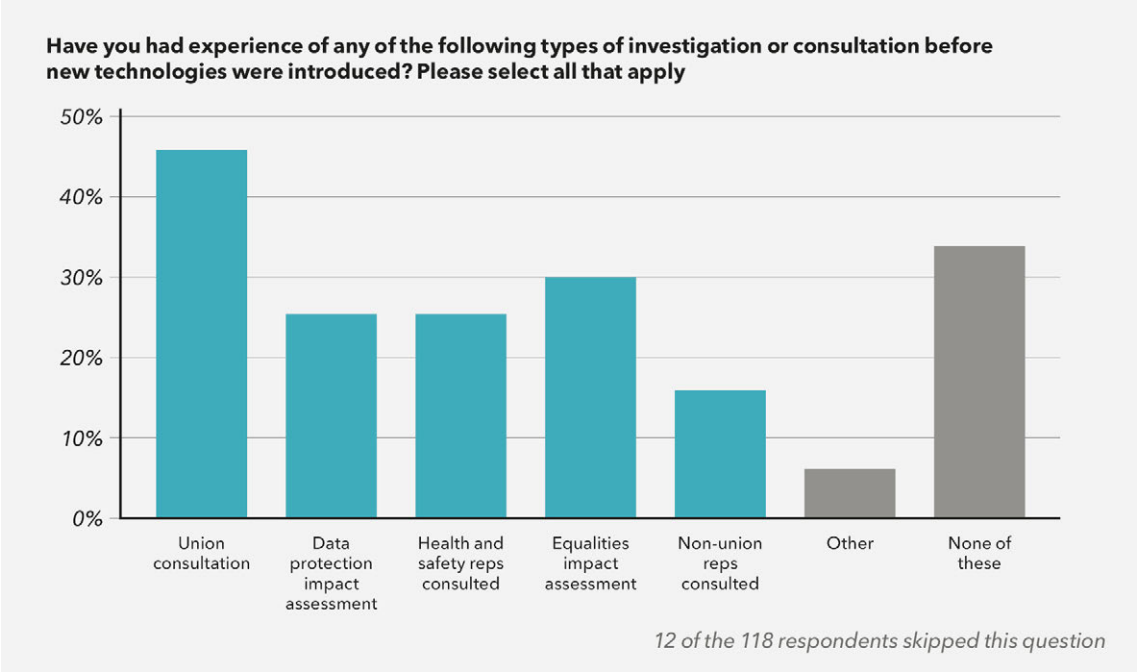
One worker explained to us:

"I haven't been involved in any consultation for any of the technologies I have been expected to use to work from home. This is in a particular context that I ought to have been consulted given my particular disability and my need for reasonable adjustments."

Trade union reps' experience of investigation and consultation before the introduction of new technologies appears from Figure 21 below to be more common than individual worker experience.

Around half of union reps responding to this question told us they had been involved in a union consultation before new technologies were introduced. Only three in ten union representatives said they had experience of an equalities impact assessment, and only a quarter had experience of either a data protection impact assessment or experience of a health and safety employee representative being consulted before new technology was introduced.

Figure 21: Consultation before introduction – union reps



Objectives

In relation to the importance of consultation, we have identified these key objectives for workers and trade unions:

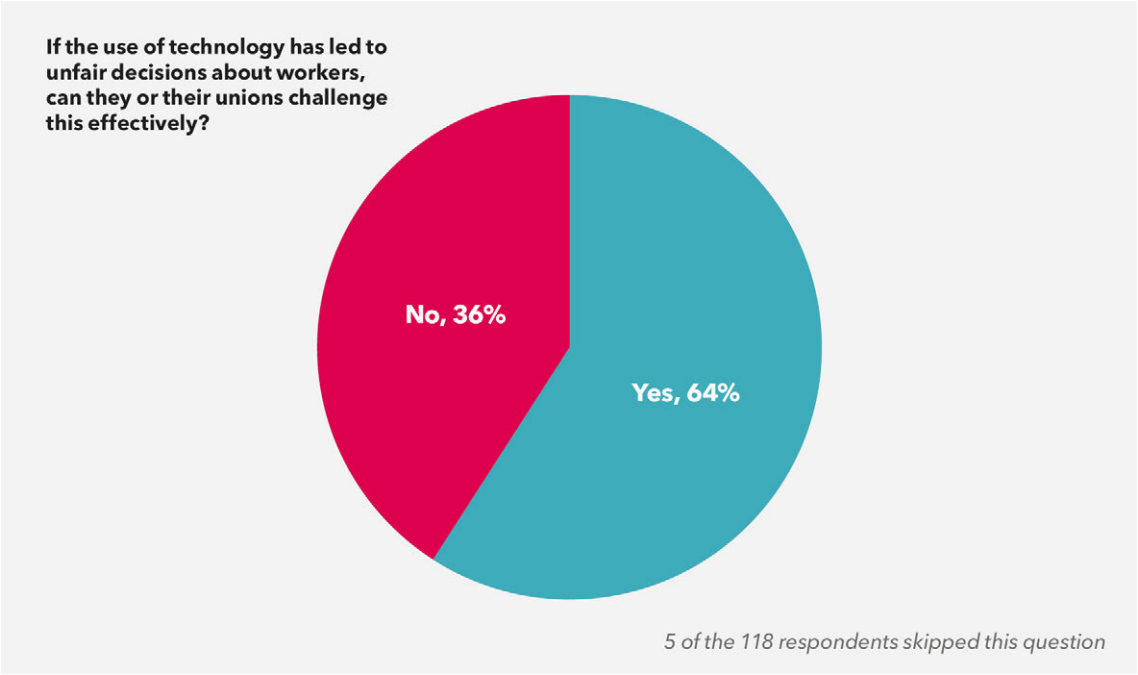
- Create strong collective bargaining on technology at work and data.
- Achieve more worker consultation on the development, introduction and operation of new technologies.
- Empower workers and trade unions with technical knowledge, understanding and vocabulary, to enable negotiation, communication, organising and lobbying.

Difficulty challenging decisions

In this section, we highlight the reasons it is difficult to challenge unfair AI decisions.

Many trade union reps do feel that they could challenge unfair decisions made by technology. However, around a third do not feel that they could do this (Figure 22).

Figure 22: Reps challenging unfair decisions



Common reasons given for both trade unions and workers not feeling able to challenge decisions include:

- management refusing to listen and believing that algorithms and technology can't be wrong
- a lack of knowledge about the algorithms used or how they work
- a lack of technical knowledge and understanding
- problems accessing data used
- a lack of any agreed policy or process by which to do this.

Only 27 per cent of workers responding to the BritainThinks polling said that if they felt uncomfortable with monitoring at work, they felt they could challenge this and stop it from happening.

We now explore these problems with challenging AI decisions in more detail.

Lack of knowledge, vocabulary and guidance

There was a concern expressed in both the worker and trade union surveys that there was little basic knowledge and awareness about AI. A UNISON rep highlighted the need for raising awareness of AI at shop floor level, developing skills to spot the use of AI and

providing guidance on how to negotiate for positive use of AI, in the interests of workers and trade unions.

The lack of transparency also stopped reps challenging AI-driven decisions, with a CWU rep explaining they couldn't successfully challenge such decisions:

> *"Because algorithms are shrouded in mystery so neither the employer nor the union truly understands what's happening".*

As outlined at the beginning of this report, employers also appear to lack knowledge about how AI works. An NEU rep who tried to challenge an employer on a decision made about a member by AI said:

> *"They didn't want to tell me and they didn't really understand it fully themselves".*

The Prospect Thought Exchange survey revealed that among the top five union priorities for dealing with data and new technologies were these goals:

- "Devise and implement a training programme for TU officers and reps. Essential for trade unions to have a strong practical and personal knowledge base in the use, advantages and dangers of data management and algorithms."
- "Provide support to help union reps negotiate for our data rights. We need to make this part of collective bargaining."

Managers blame the AI

A Prospect rep explained:

> *"It is difficult to challenge management as it is. By divesting themselves of the decision-making process the retort is it is a system decision. However, the decision is only as good as the algorithm incorporated into the system, which is developed by management. Without access to the primary data inputs to the 'system' and an alternative analysis it will be very difficult to make an alternative argument."*

Similarly, a Unite rep also said:

> *"Any AI used is assumed by an employer to be flawless and impartial therefore not open to challenge."*

Emphasising the importance of human input into decisions about workers, A CWU rep commented:

> *"I believe the main threat from AI is that it is designed to do away with the human element."*

Objectives

We identified the following objectives to improve the ability of workers and trade unions to challenge decisions made by AI:

- Workers, trade unions, employers, technologists, regulators and government need to work together.
- More active engagement with technologists by trade unions and workers will help.

We also highlight that the objectives identified above in relation to transparency, consent and consultation are all relevant to the ability to challenge decisions made by AI.

Data

In this section we consider the value of data, data components, data for workers, data crossover and data accuracy. As outlined in Section 2 of this report, data is a key component of AI and so data is at the heart of all debates about the use of AI.

Value

Data is a commodity as it is bought and sold. The phenomenon of 'surveillance capitalism', in which the personal data of individuals is a commodity harvested by AI-facilitated mass surveillance, has been meticulously articulated and explored by author Shoshana Zuboff in *The Age of Surveillance Capitalism*[47]

The use of workforce data analytics is expected to grow considerably. More than half of US companies with over $750m in annual revenue used 'non-traditional' monitoring techniques on staff last year. In 2015, 30 per cent used such tools. It's been estimated that by 2021, 80 per cent of these firms will. And it's been further estimated that workforce analytics will be a $1.87bn industry by 2025.[48]

Employers can also purchase data sets from 'data brokers'. These are third-party organisations that can provide profiles on prospective and current employees. The Financial Times highlights how data brokers can mine personal, locational and transactional data to paint a picture of an individual's life.[49]

Tastes in books, music, hobbies, dating preferences, political or religious leanings and personality traits are all packaged and sold by data brokers to a range of industries, chiefly banks and insurers, retailers, telecoms, media companies and even governments. The European Commission forecasts the data market in Europe could be worth as much as €106.8bn by 2020.

Data and Society, an independent research institute, neatly summed up the potential risks to the workforce by highlighting that workforce data analytics "can alter the power dynamics between workers and employers, as data-driven decision-making can make management more opaque and difficult to interrogate or challenge".[50]

Workers should share in the benefits that arise from the use of new technologies and data processing in the workplace. Collective bargaining processes will enable unions to consider the positive contribution that workers have made by providing workforce data and be able to use this evidence as the basis for pay increases or reductions in working time.

Data submitted by the workforce can also lead to businesses diversifying and holding data sets that have a commercial value. For example, while Uber drivers primarily carry out a taxi service, they also submit data relating to traffic flows, which could be used in town planning processes, or monitoring environmental impacts. This type of data set has a commercial value and could be taken into account during pay negotiations.

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[47] https://shoshanazuboff.com/book
[48] https://www.bbc.co.uk/news/business-47879798
[49] https://www.ft.com/content/f1590694-fe68-11e8-aebf-99e208d3e521
[50] https://datasociety.net/wp-content/uploads/2019/02/DS_Workplace_Monitoring_Surveillance_Explainer.pdf

Where workers are concerned, what matters is collective control over the collection of personal data, ownership of data, and knowledge about how their data is used. In short, in an age of surveillance capitalism, data equates to power.

AI systems-data components

As outlined in Section 2, AI has various components involving data. Workers should be empowered through trade union-led negotiating and collective bargaining to understand and influence the data components of AI systems. For example:

- collection of data – where the data is from, and how it is collected
- data analysis – what conclusions are being drawn from the data, and how these inferences are being made
- data storage and rights – how and where the data is stored, whether the storage and usage comply with the relevant data protection laws, and what the data is used for.

Data for workers

Unions have been undertaking important work to facilitate worker control over their own data so that this data can be used in the interests of workers. For example, Prospect has developed a beta version of the WeClock app that enables workers to collect, own and control their own data, and build their own data profiles.[51]

The data profiles can then be used for trade union campaigning to improve rights for workers. For example, data gathered on commute time and work completed on digital devices out of office hours could inform a campaign to reduce unpaid overtime.[52]

One worker pertinently commented on the imbalance between employers and unions over access to data to support their positions:

> *"Unions do not have access to similar levels of data to provide better context."*

Data crossover

AI platforms increasingly offer an incredibly wide range of HR functions. For example, a single platform, such as SAP (see above), offers (among many other services) the full range of HR services ranging from payroll and workforce planning to HR analytics and managing visas.[53]

Several of the trade union reps that responded to our survey highlighted the practice of using a single AI platform for a variety of purposes, meaning that there was scope for inappropriate crossover of data.

For example, one UNISON rep explained that they had experienced use of work allocation platform RotaCloud for monitoring and surveillance in disciplinary issues and use of the ITrent payroll platform for sickness absence reporting.

There is concern that unless workers know exactly what their data is being used for where a platform offers many different management services, information about a worker that is relevant in one area of their working life may, in fact, be impacting on another.

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[51] https://prospect.org.uk/news/workers-taking-control-own-data
[52] https://www.ippr.org/blog/covid-19-and-the-case-for-a-digital-commons
[53] https://www.sap.com/products/human-resources-hcm/workforce-planning-hr-analytics.html#planning

A worker illustrates the problem with their experience:

> *"We work with a laptop called Surface-Pro which uses Skype with Citrix Gateway, Yammer and just recently installed Zscaler. We know as much we are informed ... but we are completely in the dark what other functions and information gathering these programmes do that could be used against the users."*

Data accuracy

One of our trade union rep respondents highlighted the importance of the accuracy of the data at the point of this being entered into an AI system, observing that committed workers would not always record a true picture of hours worked, often working overtime but not claiming for it.

One PCS rep said:

> *"This isn't really about the tech – it's more about the belief in what the tech tells us. We need to be aware that data quality is more about people than technology."*

It is important to define the meaning of accurate data as without accurate data AI systems cannot come to accurate decisions about workers.

Some data is easy to define while other data, such as the value of soft skills (adaptability, compassion and positivity, for example), may be difficult to assess and quantify as data to input into an AI system.

A worker survey respondent also pointed out that while AI might monitor and assess performance, an AI system would not take into account factors that a human would accept as a variable for performance:

> *"People are not able to work flat out all the time, they are also affected by conditions in the workplace such as poor lighting, temperature fluctuations and poor ergonomic conditions, none of which would be taken into account by a machine."*

Another example given to us by a worker illustrates the problems of AI decisions made on the basis of particular data in isolation, without suitable context data. This worker was subject to monitoring when driving a vehicle and was negatively assessed where there were high revs and breaking. However, these techniques were unavoidable when driving in hills in the Lake District. Regardless, the AI marked them down for poor driving.

An IDU rep also reported the problem of deployment systems used in vehicles to record a variety of data such as location, drive times, breakdown time, and time of the first and last job of the day, highlighting that sometime these systems fail and record inaccurate data, but that:

> *"Trying to prove this can be very difficult as the company will say the system cannot lie".*

We also received reports of unfairness in automated CV sifting and other recruitment tools where the software was looking for keywords and blocking applications without these words, even though words with a similar meaning had been included in the application and the applicant had the required skill. Other applicants were blocked where criteria were being used by the AI that had not been stated on the job advert.

Objectives

We identified the following objectives for workers and trade unions to improve their understanding of data and their control over data:

- Educate and inform workers and trade union reps regarding the value of personal data, the implications of data ownership, and the data components of AI systems.
- Improve worker awareness of how employers use their data.
- Ensure workers understand, control and influence how their data is used by employers.
- Data used in AI components must be accurate and fair data.
- Ensure that we work with and learn from international partners and take into account how international relations and trade deals may impact on data control and transparency.

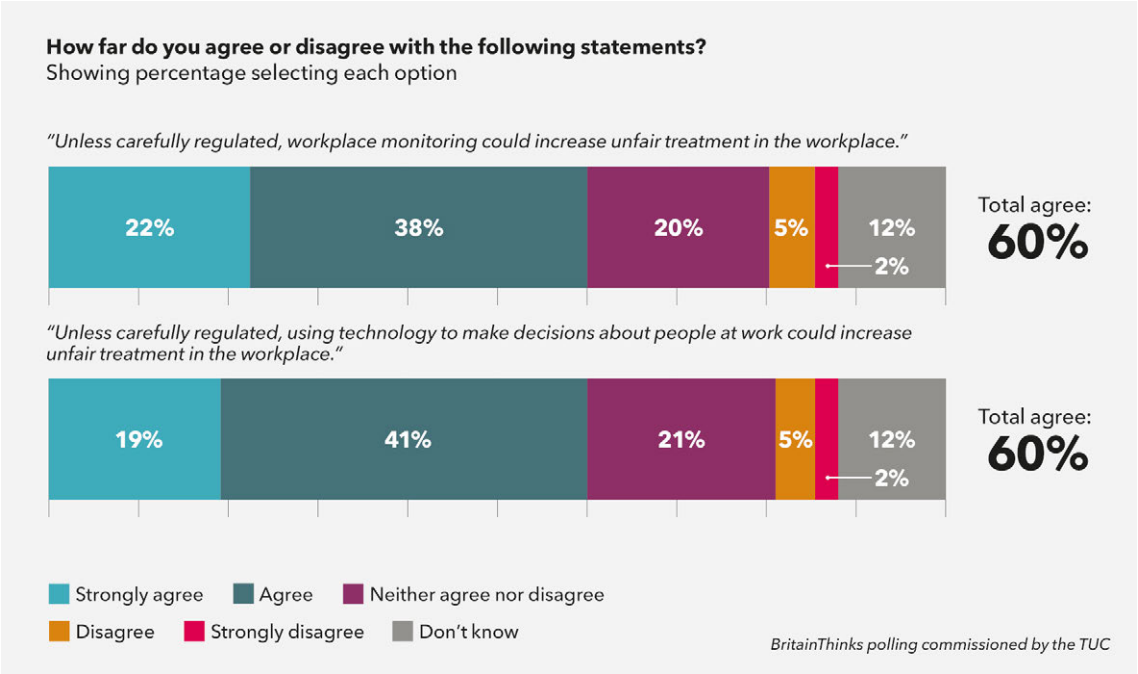
We also highlight the relevance of the objectives identified above in relation to transparency, consent and worker voice, and collaboration.

Discrimination and unfairness

In this section, we focus on different types of discrimination and unfairness that can arise from the use of AI. For example, algorithmic bias, inequality of access to AI, and problems with origins of code.

There is a strong feeling among workers that, unless carefully regulated, using technology to make decisions about people at work could increase unfair treatment in the workplace, with 60 per cent of workers in the BritainThinks polling agreeing with this statement (see Figure 23).

Figure 23: Unfair treatment



When algorithms are used for decision-making, there is potential for discrimination against individuals.[54]

[54] https://fra.europa.eu/sites/default/files/fra_uploads/fra-2018-focus-big-data_en.pdf

Algorithms and machine-learning systems can process workforce data and make decisions that significantly affect the workforce. These processes are underpinned by rules, codes and computer programmes that are developed by human beings.

It's possible for a software developer to consciously and unconsciously develop algorithms that discriminate against a particular group of workers.

There are two potential sources of a discriminatory outcome: the rules that are programmed by the software engineer; and the data that is used to 'train' the algorithm.

Direct or indirect discrimination through the use of algorithms using workforce data is increasingly considered as one of the most pressing challenges of the use of new technologies.

According to the European Union Agency for Fundamental Rights, algorithms can potentially discriminate against individuals or certain groups on the basis of particular attributes – for example, sex or ethnic origin.

A Danish trade union representative recently shared an example of this with the TUC. They came across an algorithm which operated using 'teaching data' that suggested more young Asian women did cleaning than other groups of workers. This resulted in a work allocation algorithm giving this group priority over cleaning work, to the exclusion of other groups.

Discriminatory algorithms are particularly troubling as the codes/programmes that underpin data-driven decision-making processes can be complex and totally hidden from the workforce.

It's important that there is full transparency around workplace algorithms and machine-learning systems, so that unions can assess whether algorithms are being used to discriminate against workers.

Robin Allen QC, who addressed this subject at the 2020 TUC Discrimination Law Conference, suggests that unlawful discrimination can occur when:

- Biased data sets are used to train an algorithm or machine-learning systems.
- Algorithms are unlawfully indirectly discriminatory.
- AI-based techniques are used as a form of harassment.
- Automated decision-making discriminates on the grounds of protected characteristics.

Examples of discriminatory algorithms

Amazon

Amazon[55] established a team whose objective was to develop AI that could rapidly trawl the web and spot candidates worth recruiting.

According to a Reuters news report, the group created 500 computer models focused on specific job functions and locations. They taught each to recognise some 50,000 terms that showed up on past candidates' CVs. The algorithms learned to assign little significance to

[55] https://www.reuters.com/article/us-amazon-com-jobs-automation-insight/amazon-scraps-secret-ai-recruiting-tool-that-showed-bias-against-women-idUSKCN1MK08G

skills that were common across IT applicants, such as the ability to write various computer codes.

Instead, the technology favoured candidates who described themselves using verbs more commonly found on male engineers' CVs, such as 'executed' and 'captured'. This meant that female engineers could be excluded from employment.

Gender bias was not the only issue. Problems with the data that underpinned the AI judgments meant that unqualified candidates were often recommended for all manner of jobs. With the technology returning results almost at random, the project was shut down before it was used in the recruitment process.

HireVue

HireVue[56] sells AI video interviewing systems to large firms.

Robin Allen QC flagged up the potential issues with this sort of technology:

> *"It is widely thought that HireVue's FRT approach to determining who would be truthful loyal good fit employees discriminates heavily against those with the protected characteristic of disability."*

Scholars (principally from the New York-based AI Now Institute) commented in November 2019 (Meredith Whittaker, AI Now Institute at NYU *et al., Disability, Bias, and AI,* November 2019:[57]

> *"The example of the AI company HireVue is instructive. The company sells AI video-interviewing systems to large firms, marketing these systems as capable of determining which job candidates will be successful workers, and which won't, based on a remote video interview. HireVue uses AI to analyze these videos, examining speech patterns, tone of voice, facial movements, and other indicators. Based on these factors, in combination with other assessments, the system makes recommendations about who should be scheduled for a follow-up interview, and who should not get the job."*

In a report *(Expanding Employment Success for People with Disabilities*) examining HireVue and similar tools, authors Jim Fruchterman and Joan Mellea are blunt about the way in which HireVue centres non-disabled people as the 'norm' and the implications for disabled people:

> *"[HireVue's] method massively discriminates against many people with disabilities that significantly affect facial expression and voice: disabilities such as deafness, blindness, speech disorders and surviving a stroke."*

The use of algorithms has the potential to improve the quality of decision-making by increasing the speed and accuracy with which decisions are made. If designed well, they can reduce human bias in decision-making processes. However, as the volume and variety of data used to inform decisions increases, and the algorithms used to interpret the data become more complex, concerns are growing that without proper oversight algorithms risk entrenching and potentially worsening bias.

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[56] https://www.hirevue.com/why-hirevue

[57] https://ainowinstitute.org/disabilitybiasai-2019.pdf

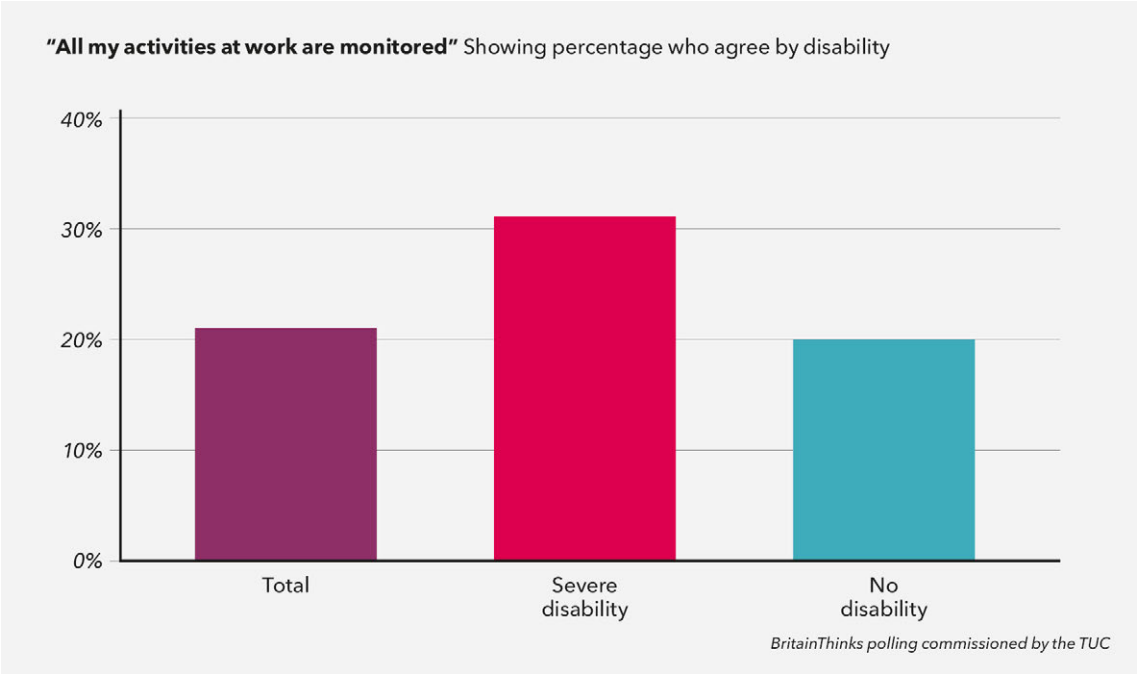
Discriminatory application of AI products

There is a possibility that certain AI-powered tools are applied in a discriminatory manner to the workforce.

The BritainThinks polling revealed that when asked about experience of monitoring, whereas 53 per cent said they had experienced at least one of the forms of monitoring (see Figure 8), this increased to 68 per cent among workers with a disability. This suggests that disabled people may be more likely to be monitored than the non-disabled.

In addition, those with a severe disability were more likely to feel that all their activities are monitored (Figure 24).

Figure 24: Perception of monitoring according to disability



We attempted to explore the impact of monitoring on groups with other protected characteristics, such as Black, Asian and minority ethnic groups. However, unfortunately the sample size from the polling was too small to discern any other patterns.

Inequality of access to AI

It came across strongly from our reps' survey that there are significant issues in terms of access for all to certain types of technology. We should not assume that everyone is computer literate, or that everyone has equal ability to access technology. A UNISON rep explained that:

> *"My main reason for completing this survey was to highlight the importance of access issues being integrated into consideration of the impact of technologies and of trade union responses/strategies".*

It was a common theme among the trade union rep respondents that they had experienced use of technology that was inaccessible to disabled workers. For example, one worker referred to:

> *"The use of HR and case recording systems that disabled workers need to use which are not accessible and/or not compatible with the software (eg screen reading) they*

use" as well as "e-training and internal communication systems similarly not being properly accessible."

Another emphasised:

"I work with a colleague who is blind and is unable to access any training materials online. She is also not able to access the platform for performance management."

Several workers also recounted the particular difficulties that older workers experience in relation to new technologies. One recounted that they had heard from older workers that:

"They felt disadvantaged by gamified selection processes following initial CV screening, when they had not been given any prior warning or indication of the nature of the tasks".

In relation to training becoming more 'e-learning based' rather than conducted by a person, one rep commented that if a worker does not speak English as their first language, the e-training is far harder for them than if this was taking place in person.

Another worker suggested that automated job interviews discriminate by income as not everyone can afford a laptop, PC or mobile phone.

When asked about the use of AI-powered technologies resulting in unfairness and discrimination, a common theme was that many workers simply didn't know if this was the case.

Country of origin of AI system

An additional issue relates to the country of origin of the AI-powered management tool. In some circumstances, coding of AI may have taken into account the regulations of the country of origin, but when deployed in other country may not function in accordance with the local rules. For example, many AI recruitment tools originate in the USA where there are very different definitions of discrimination and data protection in operation.

Working with technologists

Trade unions and workers need to work with the technologists responsible for creating the AI software to maximise the chances of fair and non-discriminatory AI decision-making.

Several respondents to our survey asked for trade unions to engage technology experts to undertake reviews of AI technologies to check that they operate fairly.

One worker suggested that diversity of experience among technologists was key to avoiding the coding of biased algorithms.

Objectives

We identified the following objectives for workers and trade unions to secure fair and lawful AI, with equality of access and application:

- Achieve ethical and socially responsible development of AI, for the benefit of all, not only employers and commercial interests.
- Ensure non-discriminatory outcomes from use of AI-powered technology and equal access for all.
- Ensure that AI deployed in the workplace is lawful: where it is not, workers have access to legal redress.

- Secure effective regulatory protection against infringement of employment rights, including rights to privacy, data protection and non-discrimination.
- Ensure effective enforcement of rights with timely intervention by regulators, as well as mechanisms to prevent and deter use of unlawful AI.

We also highlight the relevance of the objectives identified above in relation to transparency, consent, data and worker voice.

Health and wellbeing

One of the strongest messages to emerge from both our worker and trade union surveys was that worker wellbeing in terms of physical and mental health, professional development, safety and working hours was suffering greatly as a result of use of AI in people management.

Safety

A CWU rep reported to us that personal digital assistants (PDAs) are being used to monitor driver performance and that this information is then used to performance manage individuals who are challenged if their deliveries are too slow. The rep observed that this was causing some drivers to "cut corners and not follow health and safety", with the employer being fully aware of this, paying only "lip service to health and safety".

This rep ultimately used the monitoring abilities of the PDA to worker advantage, accessing the data on how far individual drivers walked, how long they were stationary and the number of delivery points they attended, and then proving that it was impossible to complete the work in the time the employer had required.

Employers can use data analytics to drive productivity. By crudely assessing productivity data, workers may be set unrealistic targets that fail to take into account important factors such as health and safety risks.

Nathan Newman, in his recent academic paper looking at the use of big data in the workplace, discusses how United Parcel Service is using data processing.[58] He explains how the introduction of handheld devices and the data they capture has been used to drive productivity. Delivery drivers were given handheld devices and their delivery vans have been equipped with 200 sensors, enabling the employer to monitor everything from stop times to when and to whom a package was delivered.

The result has been an increase in number of stops in a day from eighty-five a decade ago to a hundred stops by 2015. The total number of daily package deliveries increased by 1.4 million between 2009 and 2013 as the telematics system was being rolled out, even as UPS reduced its number of drivers by 1,000.

Workers complain of a punishing pace and increased injuries.

An important example of how work allocation and timetabling carried out by AI may fail to take account of safety factors during the coronavirus pandemic was given by a medical worker responding to our survey:

[58] https://uclawreview.org/wp-content/uploads/2018/08/85-3-4-newman.pdf

"At the start there was a lack of PPE yet we were still rotated for long shifts with only one hour break in an 11.5 hour period of work. Machines and AI just were used [to schedule the work] and nobody gave a thought about the effects of the virus in a hospital amongst the staff."

Mental health

The responses in our surveys suggested that many of the respondents found worker mental health was negatively affected by use of AI management.

In terms of performance management, replacing an annual performance review with constant real-time evaluation of performance and responses to this with incentives, rewards or discipline may well have a negative impact on the health and wellbeing of staff. Performance appraisals are widely acknowledged to be very stressful for employees.[59]

One Unite rep said:

"In my company AI Is being either used to replace staff or put staff under more pressure."

Another worker commented:

"Today's workplace has become an unfriendly and sad environment. This is not the fault of technology, it relates to the way technology is being used by employers... more research needs to be sponsored to better understand the relation of technology (mis)use and the rise of mental health issues at work."

Workers also expressed concern about how technology dehumanises people, with one commenting that this is:

"To the extent that [people] are viewed as a series of statistics measured against an arbitrary level of performance."

The lack of transparency and understanding over how important decisions are being made about workers can have a negative impact on workers' mental health, as they are left feeling powerless and without hope.

A CWU rep gave us an example of call centre workers who are matched to clients by an AI platform. Their experience is that some people are given more disconnection calls, and others more upgrade calls, yet all are still "expected to meet the same standards of performance in terms of retaining customers and selling add-ons, etc". They have tried but failed to establish how the algorithm works.

The rep reports that these difficulties resulted in significant levels of absence from work for mental health reasons.

Previous TUC research[60] has flagged up that employers monitor the time that workers spend on toilet breaks. This leads to an erosion of dignity in the workplace.

The pressure of feeling constantly watched was also a common theme:

"Literally every second of our members' days are accounted for and scrutinised." (CWU rep)

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[59] https://www.randstad.in/job-seeker/career-hub/archives/three-ways-to-beat-the-stress-of-performance-appraisals_372

[60] https://www.tuc.org.uk/research-analysis/reports/ill-be-watching-you?page=3

> *"Going to work is not enjoyable anymore, as you are scrutinised and watched over constantly."*

> *"Knowing that there is monitoring software installed, whether it is active or not, makes work more stressful. I feel like I have to second-guess everything I do and can't relax and be myself at work."*

Sadly, many workers seemed to experience work as having become "*increasingly robotic, alienating, monotonous, lonely*".

Working hours

Our research revealed some concerns about the blurring of work/home boundaries caused by employers requiring workers to use personal devices for work.

Examples given included being asked to download apps on to a personal phone, using their personal laptop and using their own broadband, all impacting on data plans and bills. The blurring of work and home life may well impact on worker wellbeing.

There were also suggestions that working hours were increased as a result of AI management.

A recent survey of around 2,000 working adults conducted by One Poll[61] found that 47 per cent of respondents gave "feeling like one must always be 'on' while at work" as a key reason for 'career burnout'.

The survey also found that remote working due to the coronavirus crisis had increased the number of hours being worked, with 59 per cent of respondents saying they've started working more hours since coronavirus restrictions began and the average remote worker having put in an extra 59 hours of work during this period.

An NEU rep described "*pressure to respond at all hours leading to anxiety and stress*" and a UNISON rep explained that "*people are sometimes expected to keep the 'phone' or device on all the time, eg to receive updates on rotas*".

A worker explained that:

> *"There are more apps being planned to be installed on our PDA devices in the coming months, which will be putting more pressure on us to add to our daily workloads".*

Another worker also explained how AI can result in over-allocation of tasks, when:

> *"The parameters of the software significantly underestimate/downplay the time required to satisfactorily complete certain tasks. This results in people feeling that they are 'over allocated' work – generating pressure to increase the pace of work and/or short cut tasks (and therefore the quality of outputs)."*

Physical health

Some concerns were also raised by workers about the physical health implications of work becoming more computer based as a result of the increased use of AI platforms to both carry out and monitor work. One said:

> *"There is a health and safety issue not being addressed here in terms of eye strain, vertebral disc compression and drying out of discs, muscular/skeletal injury."*

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[61] https://www.studyfinds.org/average-worker-career-burnout-age-32

Wellbeing apps

A number of reps reported employers either providing or recommending the use of apps to manage mental health problems and stress. For example, one employer provided the Evermind app for staff. Evermind uses data provided by workers to identify stress and provide tailor-made treatment programmes. Another employer recommended use of the mindfulness app HeadSpace.

Professional development

A UNISON rep told us:

> *"Supervision and professional and personal development are governed by online 'tick box' IT systems which do not adequately appreciate the complexities of the work being undertaken and pressure applied by targets, isolation, increased workload and lone working."*

A Unite rep also explained that:

> *"Quality training has been replaced with online learning because it is inconvenient and expensive for the employer to do it properly. Members are disciplined and treated unfairly for errors made even though overall competency levels are dropping due to a lack of training."*

Objectives

We identified the following objectives for workers and trade unions to improve worker wellbeing when being managed by AI:

- protect workers' physical and mental health
- help workers establish a decent work/life balance and appropriate boundaries between work and personal life, including when working from home and in relation to use of digital devices
- ensure employers meet regulatory health and safety obligations, but also decent work practices and standards agreed with the workforce
- ensure effective enforcement of regulatory health and safety obligations.

We also highlight the relevance to worker wellbeing of the objectives identified above in relation to transparency, consent, and worker voice.

Privacy

The use of AI has implications for workers' rights to privacy.

Employers want to know more and more about their workforce – not just how much work they are doing, but information relating to personal lives and physiological data as well. This has only increased during the coronavirus crisis.[62]

Technological devices and the subsequent data processing can encroach on an individual's right to private and family life.

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[62] *How to balance protecting health against protecting privacy in a time of Covid* https://progressivepost.eu/progressive-page/protecting-health-and-data-privacy

It's commonplace for employers to monitor email content and flow. This means they will collect personal data relating to a worker's private life. Employers are also increasingly collecting health-related personal data from the workforce.[63]

For example, employers are using sleep-monitoring devices to enhance productivity by helping ensure their workers are well rested. Big Health, a digital company promoting wellness at work, has sold its online sleep improvement programme to LinkedIn and the NHS. It's vital that safeguards are put in place to prevent the misuse of personal, health-related data.

There is also a compelling argument that the increased use of workplace technologies such as digital screens and tracking devices are having a negative impact on workers' private lives, leaving them with less quality time to spend with their families. Francis Green, an economist at University College London, has written that technologies are 'effort-biased'. As workplaces introduce innovations, the effort that employees put in also increases, leading to longer hours and fewer breaks.

A worker recounted to us the use of software (called ESafe) monitoring keystrokes for banned phrases. There had been incidents where the software had analysed private emails and flagged up highly confidential information.

This worker also expressed concern about the digitisation of HR records with no clear explanation of who has permission to access them, the restrictions in place and the protocols for accessing them. A particular concern was about access to information they considered private, such as salary details.

Objectives

We highlight that all the objectives we have identified above relating to lawful use of AI, as well as those relating to worker wellbeing, are relevant to protecting workers' right to privacy.

Insecure and low-paid work

There are some indications in our research and polling that the use of AI in management might exacerbate insecure and low-paid work.

Nathan Newman has highlighted that workforce data analytics can be used by employers to increase job and income insecurity. He flags up the example of a 'workforce management system' developed by a firm called Kronos. He states that its software:

> *"Combines in-store sales data with workforce data to optimize schedules to reduce overstaffing at any hour of the day. The introduction of the software has coincided, in the accounts of advocates against the system, with the elimination of fulltime work at store after store.*
>
> *"A key feature of the systems is that the employees willing to be available at any time are the most likely to get a full 40 hours of work, while those workers with family or other obligations limiting their availability will be slotted for fewer overall hours each week. As with variable pay, this redirects pay in the workplace from the median worker towards the younger, more time-flexible workers able to accommodate the demands of on-demand employment markets."*

[63] https://www.newstatesman.com/culture/2019/05/why-sleeplessness-political-issue

This is a clear example of where data driven decisions can lead to workers receiving less pay.

There is also evidence that workforce data analytics will be used to undermine collective wage negotiations and suppress wages. Newman flags up that companies are working on the basis that wage increases should be given to employees who are most likely to leave the organisation, as those who are likely to stay are unlikely to rock the boat. Workforce data analytics can help to identify these employees.

For example, if employees are in debt or worried about upcoming education costs for their children or just psychologically wired against risking a job switch, companies can potentially use that information to reduce or even eliminate annual raises for them. Newman also suggests that pre-employment screening tests could be used to weed out prospective candidates who are more likely to agitate for wage increases.

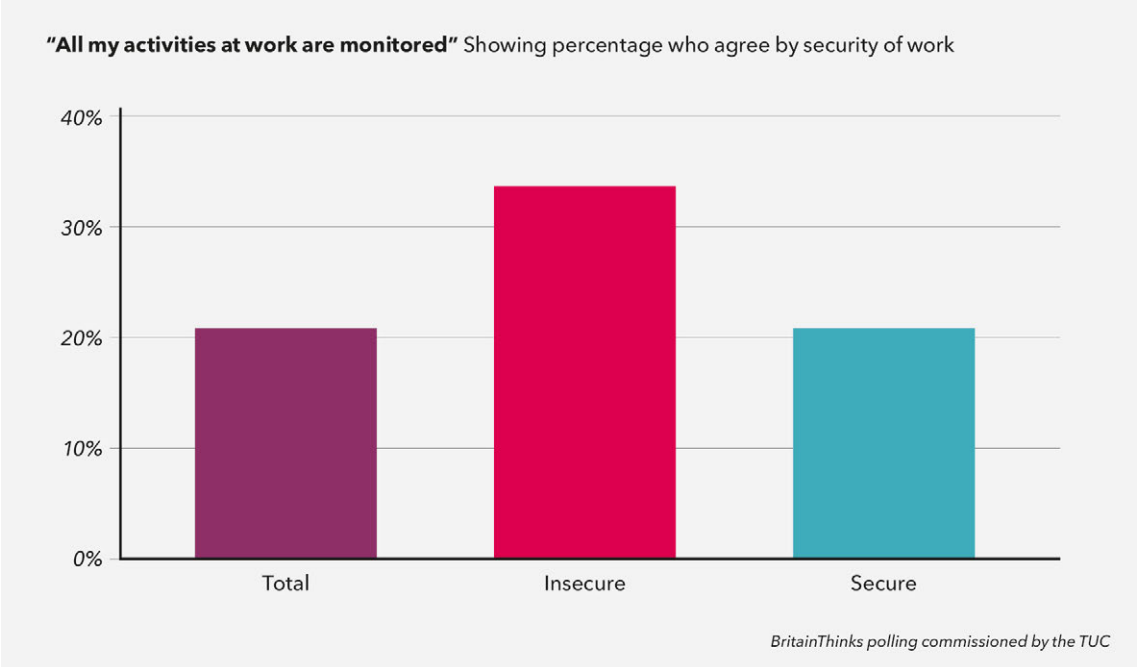
A CWU rep said:

> *"Intelligent systems are deskilling contact centre workers and suppressing wages."*

Workers also gave examples of digital records of time worked being given priority even where this was inaccurate, and their overtime pay then being withheld, as well as software that would not allow workers to input hours worked over contractual hours.

Insecure workers seem more likely to be being monitored at work, with more insecure than secure workers feeling that all their activity at work is monitored (Figure 25).

Figure 25: Perception of monitoring according to security of job



Objectives

We emphasise the importance of the objectives we have identified above in relation to worker voice and collective bargaining as key to guarding against AI being used to increase insecure work and depress wages.

In addition, we highlight the importance of the ethical and socially responsible development of AI, for the benefit of all, not only employers and commercial interests.

We also suggest that there may be potential for the development of AI that could be used to secure better work and better pay.

Opportunity

The rapid development of the use of AI at work could be viewed as an opportunity for workers and trade unions, provided their interests are fairly represented.

There was a sentiment expressed in both our worker and trade union surveys that AI technologies could be used for worker benefit, and not all survey respondents had negative experiences.

A PCS rep saw AI as providing:

> *"Opportunities to use tech to improve consistency around line management and things like reasonable adjustments".*

Demonstrating that not all workers feel negatively about monitoring, 54 per cent of workers in the BritainThinks polling agreed with a statement confirming they were comfortable with the current level of monitoring at work, and 37 per cent agreed that workplace monitoring provided a benefit by providing a fair record of what happens at work.

Another PCS rep emphasised to us that there are many ways in which the analysis of data by AI could be of benefit to workers. For example, to help workers and unions in "highlighting issues that need addressing", including "retaining and promoting BME staff".

An IDU rep said:

> *"Telematics systems can be very good if there is an incident. It can protect the driver as an independent witness."*

One worker suggested that AI monitoring systems could be used to ensure employer compliance with the Working Time Directive.

Another worker expressed the view that distribution of work and timetabling might be fairer if done by a machine than by a human.

AI can potentially make more objective and informed decisions than humans.

The European Union Agency for Fundamental Rights has shown how workforce data analytics has the potential to limit discriminatory treatment based on human decision-making that is derived from existing prejudices. While the limits of data and data analysis need to be taken into account, decisions supported by data are potentially better decisions than those without any empirical support.

Algorithms can be used to identify systematic bias and potentially discriminatory processes. To ensure that algorithms are used in a positive way, safeguards should be put in place to reduce the potential for discriminatory decisions.

Objectives

We have identified these key objectives for workers and trade unions to ensure AI at work presents an opportunity for workers and trade unions:

- initiate the development of AI technologies at work that can be used for the benefit of workers and trade unions

- investigate worker/trade union-led ways in which data can be collected and used to further worker and trade union interests.

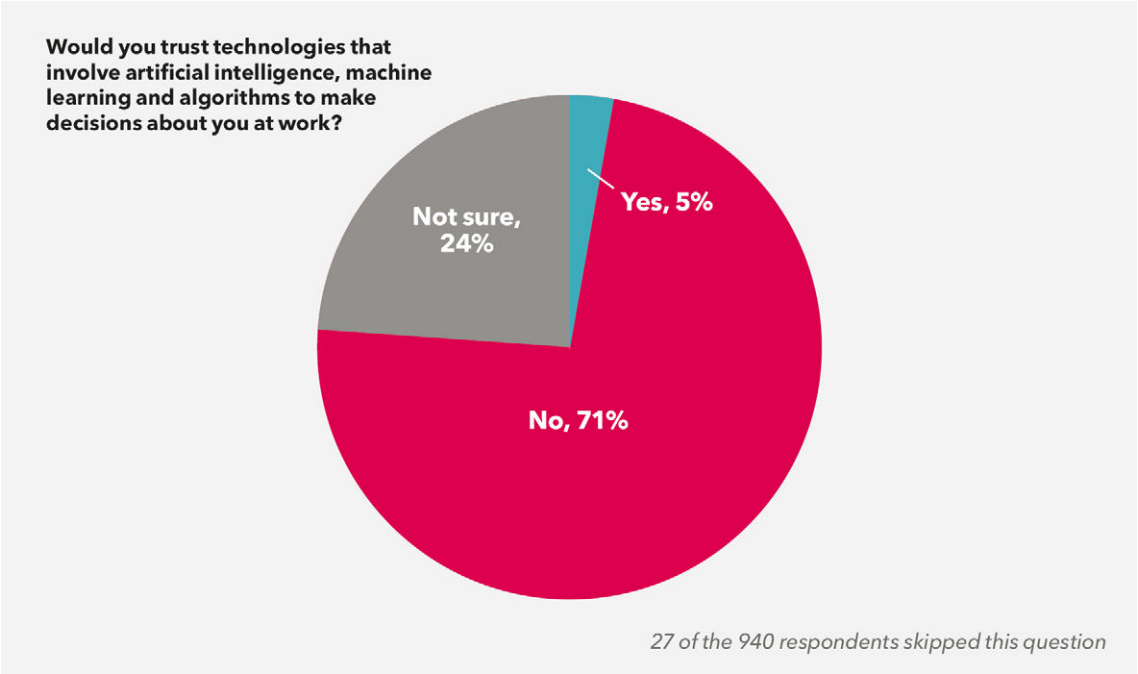
Trust

Our research suggests that most workers and trade unions representatives who responded to our surveys do not trust AI systems to make decisions about them at work.

The majority (62 per cent) of trade union reps who responded to the survey do not trust technologies that involve AI, machine learning and algorithms to make decisions about the workers they represent.

The vast majority (95 per cent) of workers who responded to this question were either not sure if they would trust AI systems or confirmed they did not (Figure 26).

Figure 26: Trusting AI

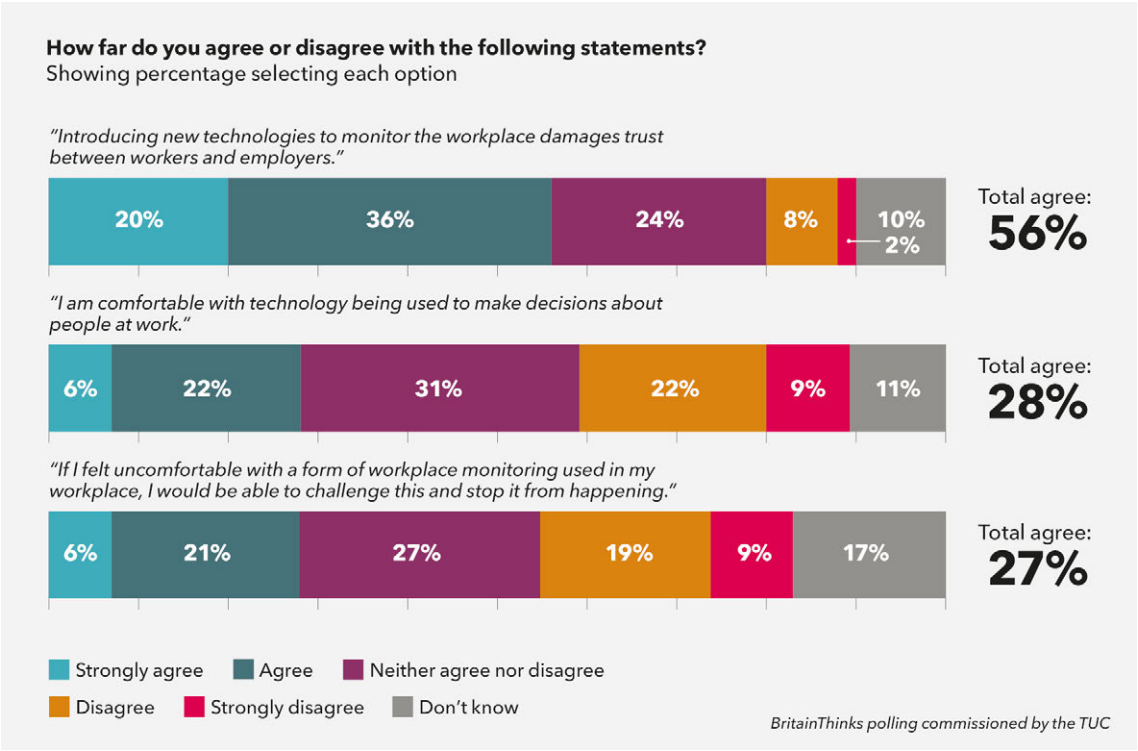


The majority (56 per cent) of workers in the BritainThinks polling agreed that introducing new technologies to monitor the workplace damages trust between workers and employers (see Figure 27).

Only 28 per cent of workers said they felt comfortable with technology being used to make decisions about people at work (see Figure 27).

The incredibly low levels of trust felt by workers towards decision-making AI technologies illustrates the extent of the progress needed to begin to resolve the issues we have raised in this report.

Figure 27: Trust and confidence in AI



Section 5

Key objectives

Taking into account the implications outlined above for workers and trade unions when AI is used to manage people, we set out below the key worker and trade union objectives that have emerged from the first stage of the TUC's AI project.

These objectives are intended to put worker and trade union interests at the heart of the development and deployment of AI at work.

The objectives will be used to inform proposals for reform in the next stage of the TUC's AI project, a legal and policy report due to be published in January 2021, as well as a guide for trade union reps later in 2021.

Worker voice

- Secure strong collective bargaining on technology at work and data.
- Achieve more worker consultation on the development, introduction, and operation of new technologies.
- Empower workers and trade unions with technical knowledge, understanding and vocabulary, to enable negotiation, communication, organising and lobbying.

Fairness and equality

- Secure ethical and socially responsible development of AI, for the benefit of all, not only employers and commercial interests.
- Ensure equality of outcome and access, including non-discriminatory outcomes from use of AI-powered technology and equal access for all.

Transparency

- Increase availability of accessible and understandable information on how AI technology works, but also on how worker data is used to inform AI powered tools, and across AI platforms.
- Increase worker awareness of when AI is operating and ensure consent is obtained where appropriate.

Worker wellbeing

- Protect workers' physical and mental health.
- Help workers establish a decent work/life balance and appropriate boundaries between work and personal life, including when working from home and in relation to use of digital devices.
- Ensure employers meet regulatory health and safety obligations, but also decent work practices and standards agreed with the workforce.
- Ensure effective enforcement of regulatory health and safety obligations.

Lawful AI

- Ensure that AI deployed in the workplace is lawful and that where it is not, workers have access to legal redress.
- Secure effective regulatory protection against infringement of employment rights, including rights to privacy, data protection and non-discrimination.
- Ensure effective enforcement of rights with timely intervention by regulators, as well as mechanisms to prevent and deter use of unlawful AI.

Collaboration

- Encourage a collaborative approach, with workers, trade unions, employers, technologists, regulators and government working together.
- Facilitate more active engagement with technologists by trade unions and workers.

Control over data

- Educate and inform workers and trade union reps regarding the value of personal data, the implications of data ownership, and the data components of AI systems.
- Enhance worker awareness of how employers use their data.
- Ensure workers understand, control and influence how their data is used by employers.
- Data used in AI components must be accurate and fair data.

Internationalism

- Ensure that we work with and learn from international partners and take into account how international relations and trade deals may impact on data control and transparency.

Opportunity

- Initiate the development of AI technologies at work which can be used for the benefit of workers and trade unions.
- Investigate worker/trade union-led ways in which data can be collected and used to further worker and trade union interests.

Appendix

Methodology

TUC surveys of workers and trade union representatives

In the summer of 2020, the TUC carried out a survey of workers and a survey of trade union reps in order to gain an insight into their experience of the use of AI in the employment relationship.

The surveys were presented in SurveyMonkey and were open to responses from 14 July 2020 to 14 September 2020.

The surveys were circulated by TUC trade union affiliates to their members, using a variety of methods, for example on websites and social media and in newsletters, emails, union publications and other circulars. The surveys were also circulated and publicised by the TUC, using similar methods.

We ask readers to note that neither of the surveys is representative. The majority of respondents are trade union members, and we had different levels of responses depending on sector. In the worker survey, by far the largest response was received from the education sector.

In the trade union rep survey, although the education sector was also disproportionately represented, there was a more even split with other sectors such as health and social care, public administration and the not-for-profit sectors.

We received a total of 940 responses to the worker survey, and 118 to the trade union rep survey. We ask readers to note that not all respondents completed every question of the survey, but that SurveyMonkey recorded the data from incomplete survey responses. We chose to use the total responses we received for each question to provide insights, and this is reflected in the tables used in this report.

BritainThinks polling

In summer 2020, the TUC commissioned some polling on the world of work from BritainThinks. This included questions on the use of technology at work, with a particular focus on monitoring and surveillance.

BritainThinks conducted an online survey of 2133 workers in England and Wales between 31 July and 5 August 2020. All respondents were either in work, on furlough or recently made redundant.

We have reproduced here the methodology set out by BritainThinks for their polling.

Methodology

- For this, quantitative stage of foundational research, BritainThinks conducted an online survey of 2,133 workers in England and Wales between 31st July - 5th August 2020. All respondents were either in work, on furlough, or recently made redundant.

- The working status of the sample was as follows:

	Unweighted base size	% of overall sample
In work	1,770	83%
Furloughed total	277	13%
• Employer not topping up wages	213	10%
• Topping up but not to 100% of usual	21	1%
• Topping up to 100%	42	2%
Made redundant in last 4 months	86	4%

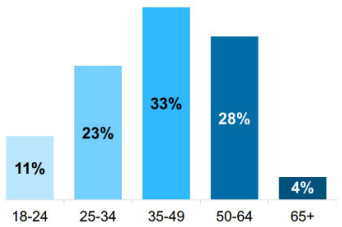
The survey covered:
- Standard demographics
- Working arrangements
- Attitudes to work
- Policy solutions
- Discrimination at work

The sample was then split in half to cover specific 'modules', with half of respondents each answering about:
- Health and safety
- Employee monitoring

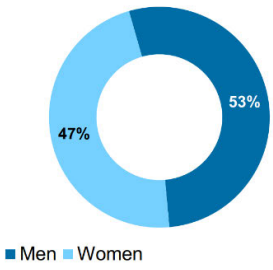
1. Introduction

Demographic information about the survey sample

Age
Showing % of all workers surveyed

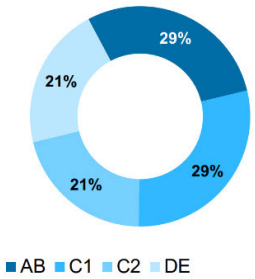


Gender
Showing % of all workers surveyed



NB – one respondent identified as non-binary

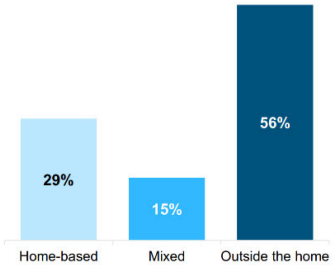
Socioeconomic grade
Showing % of all workers surveyed



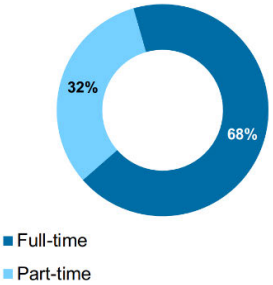
Q11. What is your age? Base: all respondents (n =2133)
Q10. Which of the following best describes how you think of yourself? Base: all respondents (n =2133)
Q7. Social grade. Base: all respondents (n= 2133)

Working status of the survey sample

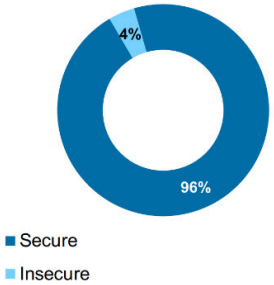
Place of work
Showing % of all surveyed who are currently in work



Working hours (pre-COVID)
Showing % of all workers surveyed



Security of contract / hours
Showing % of all workers surveyed



Insecure workers were defined as those who work through an agency or on a zero-hours contract

Q3. You said that you are working full- or part-time. Which of the following best describes where you are currently working from? Base: all respondents (n= 2133)
Q4. Thinking about a typical week. How many hours did you work before lockdown began in England and Wales in response to the Coronavirus pandemic (on 23rd March 2020)? Base: all respondents (n= 2133)
Q5. Which of the following best describes your current/most recent type of employment? Base: all respondents (n= 2133)

Boosts to the survey sample

- In addition to nationally representative quotas on age, gender, SEG, working hours and security of work in line with ONS Labour Force survey data, we boosted three key audience groups (BAME workers, LGB workers, and disabled workers) to allow analysis by these groups.
- These boosted groups were then weighted down to their usual incidence rate when calculating responses for the total sample to ensure that these boosts did not skew the overall sample, and that this remained broadly nationally representative of workers in England and Wales.

Ethnicity	Incidence	Boost
BAME	10%	308 from 220

Sexuality	Incidence	Boost
LBG	5%	209 from 103

Disability	Incidence	Boost
Disabled	3%	101 from 63