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AI IN RETAIL: A TRADE UNION PERSPECTIVE

RISKS, RIGHTS, INSIGHTS AND TRADE UNION STRATEGIES

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MMAI – Monitoring and Managing – the use of AI in retail.
How to secure good working conditions by negotiating the algorithm.

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GLOSSARY

Term	Definition
Algorithm	A sequence of rules that a computer uses to complete a task. An algorithm takes an input (e.g. a dataset) and generates an output (e.g. a pattern that it has found in the data). Algorithms underpin the technology that makes our lives tick, from smartphones and social media to sat nav and online dating. In retail, they can forecast demand, organise supply chains, help with scheduling and more.
Algorithmic Bias	Unfairness that can arise result in an algorithm inappropriately privileging or disadvantaging one group of users over another group. Algorithmic biases often result from biases in the data that has been used to train the algorithm, which can lead to the reinforcement of systemic prejudices around race, gender, sexuality, disability or ethnicity.
Artificial Intelligence (AI)	Machinery that can perform tasks that would previously have required human brainpower to accomplish. AI is a broad field that incorporates many different aspects of intelligence, such as reasoning, making decisions, learning from mistakes, communicating, solving problems, and moving around the physical world. AI is now found in everyday applications, including virtual assistants, search engines, navigation apps and online banking.
Big Data	Research that deals with very large datasets. The field has grown rapidly over the past couple of decades as computer systems became capable of storing and analysing the vast amounts of data increasingly being collected about our lives and our planet. A key challenge in big data is working out how to generate useful insights from the data without inappropriately compromising the privacy of the people to whom the data relates.
Chatbot	A software application that has been designed to mimic human conversation, allowing it to talk to users via text or speech. Previously used mostly as virtual assistants in customer service, chatbots are becoming increasingly powerful and can now answer users' questions across a variety of topics, as well as generating stories, articles, poems and more (see also 'generative AI').
Computer Vision	A field of research that uses computers to obtain useful information from digital images or videos. Applications include object recognition (e.g. identifying animal species in photographs), facial recognition (smart passport checkers), medical imaging (spotting tumours in scans), navigation (self-driving cars) and video surveillance (monitoring crowd levels at events). In retail, it can (for example) help identify defects or forgeries, monitor shoppers and stock levels, and detect theft.
Customer Relationship Management (CRM) software	A subset of ERP software, which stores and managers data on a firm's business contacts. It helps retailers gather and analyse customer data, to build customer profiles, to deliver more personalised customer services, and (in some cases) monitor the performance of sales workers. CRM software is increasingly AI-enabled.
Data	Any information that has been collected for analysis or reference. Data can take the form of numbers and statistics, text, symbols, or multimedia such as images, videos, sounds and maps. Data that has been collected but not yet processed, cleaned or analysed is known as 'raw' or 'primary' data. In commerce, data points include sales figures, records of footfall, and inventory levels – among many others.
Dataset	A collection of data that can be analysed to obtain information. Datasets are often collected and stored in a tabular format, with each column corresponding to a different variable (e.g. height, weight, age) and each row corresponding to a different entry or 'record' (e.g. a different person). The data might come from real-life observations and measurements, or it can be generated artificially.

Term	Definition
Deep Learning	A form of machine learning that uses computational structures known as 'neural networks' to automatically recognise patterns in data and provide a suitable output, such as a prediction or evidence for a decision. Deep learning neural networks are loosely inspired by the way neurons in animal brains are organised, being composed of multiple layers of simple computational units ('neurons'), and they are suited to complex learning tasks such as picking out features in images and speech.
Digital Twin	A computer model that simulates an object in the real world. Analysing the model's output can tell researchers how the physical object will behave, helping them to improve its real-world design and/or functioning. Digital twins can be used in retail, for example, to experiment with a digital simulation of a retail store layout – to predict footfall and sales without making physical changes.
ERP (Enterprise Resource Planning) software	The main software platform that medium and large companies run on. ERP integrates data and workflows on finance, human resources, core business processes, and supply chain management.
Foundation Model	A machine learning model trained on a vast amount of data so that it can be easily adapted for a wide range of applications. A common type of foundation model is large language models, which power chatbots such as ChatGPT.
Generative AI (Gen AI)	An artificial intelligence system that generates text, images, audio, video or other media in response to user prompts. It uses machine learning techniques to create new data that has similar characteristics to the data it was trained on.
Human-in-the-Loop	A system comprising a human and an artificial intelligence component, in which the human can intervene in some significant way, e.g. by training, tuning or testing the system's algorithm so that it produces more useful results.
Key Performance Indicator (KPI)	Metrics commonly used in workplaces to measure employee performance. In retail, these could pertain to sales data or productivity.
Large Language Model (LLM)	A type of foundation model that is trained on a vast amount of textual data in order to carry out language-related tasks.
Learning Management System (LMS)	Recommend training resources based on performance, qualification and skills.
Machine Learning (ML)	A field of artificial intelligence involving computer algorithms that can 'learn' by finding patterns in sample data.
Natural Language Processing (NLP)	A field of artificial intelligence that uses computer algorithms to analyse or synthesise human speech and text.
Neural Network	An artificial intelligence system inspired by the biological brain, consisting of a large set of simple, interconnected computational units ('neurons').
Point of Sale (POS)	Checkout system, including the hardware and software used to complete a transaction between retailer and customer.
Robot	A machine that is capable of automatically carrying out a series of physical actions.
Synthetic Data	Data that is generated artificially, rather than by real-world events.
WMS (Warehouse Management System)	Software used by warehouse managers to streamline and integrate flows of goods, work processes and storage.

AI-related definitions are modified from those provided by the Alan Turing Institute.[1]

1

INTRODUCTION

AI and related algorithmic technologies are proliferating in retail. AI is now endemic throughout the lifecycle of employment, from recruitment, management, discipline and reward.[2]

With AI increasingly viewed as a 'strategic imperative' by many firms within the commerce sector, staying attuned to technological developments is critical.[3] However, the rapid adoption of AI in workplaces often outpaces workers' and unions' understanding of its implications. Uncertainty surrounding AI's role in workplace dynamics can generate fear and anxiety, and AI is emerging as a "source of friction" in labour relations.[4] For unions and workplace reps, the key challenge lies in striking a balance between enabling technological innovation and capitalising on improvements in working conditions offered by AI applications, while safeguarding workers' rights and job security and mitigating risks. Getting this balance right can facilitate a smoother transition and maximize the benefits of AI technology for all.

This guide is intended to function as a guide to help retail and commerce sector unions, worker representatives, and workers navigate the sometimes-confusing landscape of AI technologies. The guide covers extant uses of AI-enabled technologies in the retail sector identified in a scoping review of recent research, news and trade documentation, as well as interviews with industry experts and trade union representatives from across Europe. It provides examples of specific applications of AI, discusses the opportunities and risks they present and suggests potential union responses.

Section 2 provides background, and answers key questions about AI technologies in the retail sector in clear and simple language. Section 3 provides an overview of key risks and opportunities for retail workers and unions stemming from the introduction of AI technologies. This is complimented by the Appendix which details key applications across a range of functions. Section 4 considers how unions can best respond to AI applications. It sets out an approach for collective bargaining over AI and considers how retail unions can themselves utilise AI to enhance their organising and bargaining activities. Section 5 briefly concludes.

Unions and workers must be aware of the issues identified in the next section to ensure they do not become misguided by misleading or false claims regarding AI technologies. Emerging regulation, like the EU's AI Act, does not well address the manifold potential harms AI (mis)use and misunderstandings can create for workers. As such, substantial responsibility falls on workers and unions to understand these technologies and ensure that they are deployed appropriately, responsibly, and in ways which do not harm workers or the firms for which they work.

2

UNDERSTANDING AI IN RETAIL: KEY QUESTIONS

2.1 WHAT IS AI?

AI is not easy to define and even the OECD definition[5] has been revised in recent years. However, the OECD notes that AI systems automatically perform tasks or make suggestions in response to incoming data – often without the need for human intervention.[6] Still, even this definition is unavoidably broad. Tools like spell-check, autocomplete, and spam filtering were once considered akin to 'AI' but are now rarely considered as such. Not all automation is artificial intelligence. Many systems, such as barcode scanners or conveyor belts, operate using fixed, rule-based programming. AI systems, in contrast, often learn from or are trained using data and make decisions that are not explicitly pre-programmed. As such, any definition is more of a loose guide than definitive. Three rules of thumb can help distinguish whether it is helpful to term a product AI or not. First, would a human require skill or training to conduct this task? Second, is the decision or behaviour specified in advance, or has it been developed by learning from examples or data? Third, can the system take decisions and execute commands more or less autonomously, without human intervention? Systems that fulfil these criteria might helpfully be called AI.[7]

It is also useful to distinguish two broad functions of AI. The first is AI systems which make recommendations and/or take decisions. We call this **'predictive AI'**. It draws conclusions based on patterns in past data. Predictive AI is the dominant form in use in the retail sector. More recently, AI has begun generating text, images, videos and other outputs. The second is called **'generative AI'** (GenAI) and is familiar to the public in the form of products like ChatGPT and MidJourney. While predictive AI has been in use for some time in retail sector workplaces, use cases of generative AI remain emergent.

Most AI needs to be trained on large volumes of data. Today, this is often done through **'machine-learning'** (ML) (or a particular version of ML called **'deep learning'**). ML is a process where algorithms crunch extremely large numbers of data points to find correlations humans could not manually identify, and draw general conclusions from these correlations. Although it sounds technical, ML is just a way to describe how computers identify patterns by analysing large datasets.

2.2 WHY HAS IT BECOME SO PROMINENT?

AI and algorithmic applications were once fairly simple, developed largely in-house by computer scientists working within retail firms. They took the form of decision-taking and recommendation-making algorithms which, for example, used sales data to forecast demand, and data from HR to automatically call absentee workers in for a meeting, or to flag workers not hitting key performance indicators for review. Most of this data was internal to the firm and stored on internal computing systems.

Today, firms have almost entirely outsourced their ICT (computing) systems to third party cloud vendors like Amazon Web Services, Microsoft, and Google.[8] Most AI products are now supplied by the tech giants listed above – either directly, or via third party firms which use the tech giants' AI data centres to build niche software applications. Big tech firms like Microsoft, Google, Facebook, Apple and Amazon have piled into the sector, investing hundreds of billions of dollars in artificial intelligence operations in the last few years. And spending is forecast to increase even further over the coming decade.[9] Most of this does not go into funding development of software and code, but rather the hugely expensive and power-hungry infrastructure that powers AI: computer chips and the data centres that run their models. These tech giants are spending so big because they see AI as a key profit centre for the future.

Despite all this investment, reported uptake of AI products by employers is still fairly low, with recent studies putting it at around 14% in Europe.[10] But AI is being embedded in lots of enterprise-wide software used on a daily basis.[11] Managers often don't know about these functions. As such, it's likely that adoption is higher than even the best survey-based data is able to capture.

2.3 IS AI REALLY ARTIFICIAL? AND IS IT REALLY INTELLIGENT?

The term 'AI' is misleading, because in important ways the products it describes are neither artificial nor intelligent. AI applications are trained overwhelmingly on data produced by humans.[12] Most AI also relies heavily upon consistent human 'course correction'. Some of this is done by developers, and much is also done by workers who interact with the technology on a daily basis. Workers in poorer countries, often working in highly exploitative conditions for low pay, also play an important role.[13] As such, AI is not really artificial. Instead, it is software produced by a value chain of human labour.

Many AI tools used in retail—such as recommendation systems, chatbots, and inventory software—rely on human workers who label data or moderate content, often employed under precarious conditions by outsourcing firms in the Global South. Although these data

labelers and content moderators are not directly part of the retail workforce, their work is essential to the functioning of AI systems in modern commerce. Despite this, their contributions remain largely invisible and are often not protected by adequate labour standards.

AI is also not meaningfully intelligent. AI technologies do not meaningfully 'understand' the material they encounter. Instead, using the machine learning techniques described above, AI technologies crunch vast volumes of data to try to identify patterns which lead to particular outcomes. While the algorithms involved can be sophisticated, they are products of human design and are not themselves 'intelligent'. Moreover, machine-learning based AI cannot show its 'reasoning', but instead remains a 'black box'. As such, extensive reverse engineering is often required to discover why a particular decision was taken, and to ensure it was not the result of a spurious correlation.

2.4 WHY IS AI SO ATTRACTIVE FOR BUSINESS, AND WHY IS IT ATTRACTIVE FOR RETAILERS?

The number one reason AI is appealing to executives and managers is that it seems to offer a quick and relatively cheap fix for struggling business models. Installing off-the-shelf AI products can seem to many managers like a good way to boost growth and productivity without making large-scale and expensive capital investments, which can carry a high degree of risk.

The promise of cheap growth is connected to concerns about being left behind in a wave of technological change. A recent survey of 1,700 company executives found that 84% anticipate 'massive organizational benefits' to flow from adopting AI technologies. Similar numbers felt under significant pressure to quickly adopt AI because rivals were doing the same.[14]

The economic problems confronting the broader economy (described above) are even more acute in the European retail sector. The Centre for Retail Research describes the industry as facing a 'permacrisis' since 2008.[15] Key problems confronting retailers include low margins, slow growth, weak consumer demand, low productivity, and high debts which weigh on investment. While some notable firms have experienced successes, the commerce sector has underperformed during recent years. This has piled pressure on executives and managers to find ways to grow, while at the same time making them wary of spending significant money on new technologies.

In this context, pressure from investors and competition amongst firms to become an 'AI leader' can drive a lack of due diligence or careful consideration of whether to adopt AI technologies, and if so, how best to do so in beneficial and safe ways.

2.5 DOES AI REALLY WORK?

AI can help solve particular tasks.[16] If a task is routine, clearly defined, and the outcome usually known in advance, it is likely that AI tools could be able to perform it well (with sufficient training). But the greater the complexity, the more likely it is that AI solutions may not represent a very effective solution or alternative to human labour.[17]

This should cause real concern for workers in the commerce sector, because there is a danger that managers adopt AI products which lead to *no (or even negative) productivity gains*. One recent large-scale survey of AI adopting firms in Canada found "no conclusive evidence of a strong positive or negative relationship between AI adoption and short-term productivity improvement".[18] Research amongst employees paints an even worse picture. A survey of workers whose workplaces had recently adopted AI products found that 77% made them *less* productive, adding to workloads due to unrealistic expectations from management about the expected productivity gains, piling pressure on workers.[19]

There are four big reasons why AI-enabled systems may not work:

1. they can be given tasks which they cannot perform.
2. Poor design and implementation.
3. Unexpected real-world problems or challenges.
4. Hype which overstates their capabilities.[20]

AI works by reducing every task to a measurable quantity. This means it is highly vulnerable to 'Goodhart's law', which states that: "when a measure of something becomes a target, it is no longer a good measure". If workers learn how to 'please' an AI system which measures their performance, they will do so even if it makes them worse at their job. For example, if an AI system is measuring productivity by 'number of tasks completed', workers are incentivised to hurry up and complete large numbers of tasks – even if the task is useless or if they are performed badly.

3

USES, RISKS AND OPPORTUNITIES

3.1 USES OF AI IN THE RETAIL SECTOR

As AI tools become more affordable and the range of AI applications grows, the barriers to their use in the retail sector falls. AI-enabled tools have the potential to impact many parts of commerce work. Figure 1 lists current uses and applications of AI in the retail sector uncovered in our scoping review and the technologies and processes that enable them. These AI applications make use of data and inputs from a range of different sources and technologies, and apply a range of AI-enabled processes in order to produce outputs, recommendations and/or decisions.

These applications can be broadly grouped into five main types of uses: supply chain and logistics; customer monitoring and personalisation; security and loss prevention; store and customer service automation; and worker management and HR processes. While there is some overlap between these types of uses, and some specific tools or applications may straddle more than one group, this categorisation aids in understanding what these applications are used for and how they relate to retail workers. While some of these applications are primarily aimed at customers or logistics, they change the way work in retail is organised and carried out and so have consequences for workers.

SUPPLY CHAIN AND LOGISTICS APPLICATIONS

There are three main uses of AI in this area. First, AI and algorithmic technologies are increasingly used to enable firms to provide e-commerce, omnichannel and quick-commerce services. Not only are AI systems used in these services to personalise advertisements and offers in order to encourage sales (next section), but AI is also used in order fulfilment and **last-mile delivery systems** (Appendix 7.1.1). Second, while still relatively nascent in most parts of retail, a number of larger retailers have invested significantly in **autonomous and automated warehousing** (Appendix 7.1.2) in recent years. These technologies range from fully automated warehouses, where robots process orders for delivery or distribution with little to no intervention from humans, to augmentation systems aimed at directing or assisting human warehouse staff and warehouse management systems (WMS) designed to integrate data from a variety of sources to optimise workflows. The third main type of applications in this category are automated ordering and **inventory management systems** (Appendix 7.1.3). These systems use a range of different technologies such as shelf-facing cameras, RFID tags, image recognition and weighing scales to monitor in-store stock and order more stock when needed. Some of these systems can also incorporate data insights from external sources, such as weather and consumer trends, in order to predict demand.

CUSTOMER MONITORING AND PERSONALISATION

A variety of technologies, such as in-store cameras, Wi-Fi beacons, RFID tags, Smart Mirrors and in-store tablets and devices have started to be used to monitor customer movements in-store and interactions with products. These can feed into customer personalisation and marketing systems as well as supply chain, staff scheduling, task allocation and loss prevention systems. While ostensibly aimed at customers, these monitoring and personalisation systems have significant implications for how retail staff interact with customers and therefore work in the sector. For example, just as online retailers track customers actions on their websites, AI-enabled systems can use Bluetooth, WiFi beacons and cameras to track customers around bricks-and-mortar stores. **Customer movement heatmaps** (Appendix 7.2.1), produced by these systems, can be used to optimise store layout, staffing and product placement, while also directing staff to attend to customers. In addition, these systems, along with other technologies such as smart mirrors and body scanners, can be used for **predictive marketing** (Appendix 7.2.2), alerting customers to products and offers tailored directly to them. Such systems change the value of advice given by sales staff, potentially devaluing their skills. These systems can also feed into task allocation, targets and reward and staff allocation systems (see below) and so can contribute to increased staff monitoring and work intensification.

WORKER MANAGEMENT AND HR PROCESSES

A number of tools use AI to feed into worker management and HR processes. Firstly, **work/staff planning and scheduling tools** (Appendix 7.3.1) use machine learning algorithms and data from a range of sources including historical staffing data, in-store cameras and heatmapping technologies, and data from external sources (such as weather forecasts and consumer trends) to predict customer demand and in-store traffic in order to optimize short-term and longer-term staffing needs. Some systems also feed into automated scheduling. Similar systems can also be used to direct staff to customers, set **targets and assign tasks** (Appendix 7.3.2) using point-

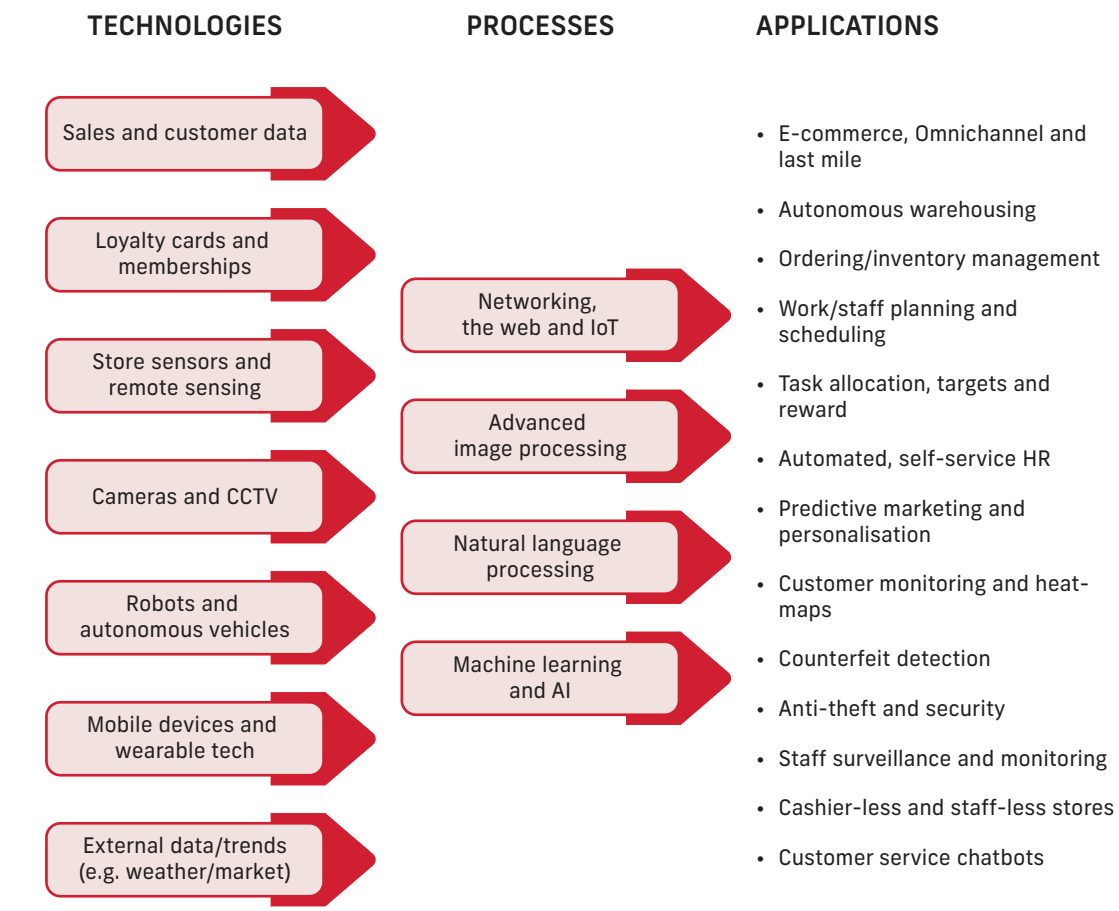
of-sales data, wearable or hand-held devices, in-store cameras and customer heatmaps. These systems are often used for click and collect services and can be used to set targets for pick rates, customer interactions and sales. These systems can lead to increased performance monitoring. Recent years have also seen an increasing use of AI and ML in **hiring, onboarding and access to HR services** (Appendix 7.3.3), such as training, payslips, schedules and holiday booking. These systems are aimed at streamlining HR processes and freeing up the time of HR staff for more strategic tasks and relationship building.

STORE AND CUSTOMER SERVICE AUTOMATION

Cashier-less and staff-less stores (Appendix 7.4.1) have been popping up in cities around the world, with a number of retailers investing in the technology.[21] While not all self-checkouts use AI, some advanced systems rely on a range of cameras, sensors and tagging technologies, powered by AI, in order to track customers and items across stores and identify what is in customers' baskets, without the need for customers to scan items. While most stores using these technologies are not entirely staff-less, they automate the simplest retail tasks leaving remaining staff with more complex tasks, such as dealing with problems when things go wrong, and potentially putting them in an adversarial position with customers if needed to monitor loss control (see below).[22]

Checkouts and warehousing are not the only areas of retail work affected by automation. **Customer service chatbots** are increasingly being used in e-commerce and omnichannel offerings to answer customer queries, make recommendations and deal with customer complaints and issues (Appendix 7.4.2). These systems range

Figure 1: Technologies, processes and applications



Source: Adapted from Hunt and Rolf, 2022[19]

in complexity between simple decision tree algorithms to more complex systems using natural language processing and ML to create a more human-like experience.

SECURITY AND LOSS PREVENTION

The use of AI for security and loss prevention can be broken down into three main uses. Firstly, tools using technologies such as ML, machine vision and blockchain are being used to **detect counterfeit goods** (Appendix 7.5.1) in the supply chain, in third-party online marketplaces and during in-store returns. Whilst the use of such systems can make counterfeit detection easier for staff, they can potentially add to the workload of store and logistics staff required to carry out the process. Secondly, AI-based systems are increasingly emerging aimed at **anti-theft detection and security** (Appendix 7.5.2). Some customer monitoring systems can be used to identify patterns of behaviour predicted to be 'suspicious', alerting staff to intervene, and some systems use facial recognition to identify customers who have already been flagged for theft or security concerns. Additionally, systems using cameras, RFID tags, weight sensors, machine vision and ML are used to identify fraudulent activity at checkouts, such as substituting items for lower value items. Finally, a number of AI-enabled systems can be used for **staff monitoring and surveillance** (Appendix 7.5.3). For example, some task allocation and reward systems can monitor staff performance across various activities and be used to single out less productive staff.[23] The use of customer data may indirectly provide a means to monitor staff performance informing how work is allocated and scheduled, exposing workers to changeable shift patterns. Some loss prevention systems also use administrative data to model employee behaviour and flag activities in ordering, processing or returns processes that could be fraudulent.[24]

Appendix A provides a reference guide which details these technologies and their individual risks and benefits for workers.

The following section aims to help inform the approaches trades unions can use to navigate this evolving landscape, introducing the key risks and opportunities stemming from AI.

3.2 RISKS AND OPPORTUNITIES OF AI IN RETAIL

The implementation of AI tools in the commerce sector has far-reaching implications for workers and unions. The following analysis explores the impact of these transformative technologies for commerce workers in a range of settings, including store based, warehousing and distribution. These implications are broken down into three main areas: **job change; management and control; and data use (including ethical implications).** The adoption and impact of AI varies considerably by subsector, market segment and firm.

This section functions as a mapping tool to highlight key issues and break down the direct and indirect impacts of AI for workers and reps. Key risks and opportunities for workers and their representatives in the face of increasing AI adoption are illustrated with examples.

3.2.1 CHANGE TO QUANTITY, QUALITY AND CONTENT OF JOBS

AI is often depicted as a threat to jobs. However, in the retail sector AI technologies are more commonly associated with job change, impacting job quality and working conditions.

LABOUR SUBSTITUTION AND JOB CONTENT

Labour-substituting AI applications (like fully cashier-less stores and fully-robotised warehouses) remain quite limited.[25] While firms such as REWE, Tesco and Aldi continue to develop and expand their use of cashier-less technology, Amazon, an early initiator, are discontinuing it due to the high cost associated with its rollout.[26] Where it is adopted, existing job roles are usually adapted to account for more customer service, inventory management and security functions, rather than jobs disappearing.

Cashier-less technologies (supported by AI technologies like machine vision) are driving a decrease in checkout related jobs, and present significant challenges for workers in terms of changing job content, creating a more demanding work environment.

> *"First you were a cashier, then self-service assistant, now there's one colleague for a whole series of checkouts. This changes gradually. Suddenly you find ten cashiers have a completely different job" (ver.di, Germany).*

Cashier-less technologies result in less customer interaction, as employees are required to multitask. Practical and technical issues, such as purchasing age restricted items, malfunctioning scales, non-scanning barcodes and security locked products, as well as interacting with

anti-theft systems, can all result in stressful confrontations with customers. These changes can impact morale and work satisfaction. In addition, they may impact staff wellbeing for those who value having a customer facing focus while at the same time undermining the connection offered for customers.

> *"The self-scan checkouts are an absolute disaster. You have one or two checkout staff covering, you know what it's like when you go into a supermarket, you know, they're running around, it's really, really stressful. And then customers are obviously stealing a lot of stock as well. There's an expectation on the colleagues to manage that and that's not their job, quite frankly." (GMB, UK).*

The decline in traditional cashier roles has been coupled with the expansion of click-and-collect services and e-commerce, enhanced by lockdowns during the Covid-19 pandemic. This transformation has increased demand for workers both in-store and warehouse settings to pick and pack goods for order fulfilment. For instore workers the integration of online and in person sales can make the work less repetitive, a key driver of staff turnover in retail.[27] However, the decline of cashier roles may have gendered effects across the commerce industry, considering the higher representation of women in retail stores and the predominance of men in warehousing and distribution sectors.

Automated warehousing, accelerated by AI, is also driving jobs substitution and reconfiguration. Companies like Amazon have heavily invested in automation and robotics to reduce repetitive tasks in retail and warehousing.[28] McKinsey predicts a 17 percent decline in physical and manual tasks due to technological advancements.[29] While this trend has the potential to make work less physically demanding it also requires more skilled workers to operate and maintain advanced systems, potentially offering opportunities for job development and reskilling, while also helping to address labour shortages across the sector.[30]

However, the adoption of automated fulfilment centres is progressing slowly, due to the costs and challenges in automating tasks like fresh food picking. Many retailers are opting for a hybrid model, integrating automated systems with human workers. For instance, Walmart has implemented AI-driven technology that optimizes pick routes and uses gamification to incentivize staff.[31] This approach aims to boost productivity while maintaining a human workforce but can potentially make work more intense.

Electronic shelf labels are novel AI-powered tools which enable instant updates to prices and facilitate personalised offers. These can minimise rote tasks like weekly labelling. Other AI tools for inventory management, customer personalization, and logistics optimisation are accelerating the shift to e-commerce, omnichannel and quick-commerce. These shifts are driving increased work outsourcing, as logistics and warehousing (along with other work like data analysis) become more important to retail business models.[32] Outsourced work is frequently performed under inferior terms and conditions, resulting in a two-tier workforce and eroding collective bargaining power. As the commerce sector continues to evolve, balancing technological advancements brought about by AI with workforce wellbeing remains a critical challenge for the industry.

Despite these potential risks, AI adoption can enhance work quality. Unions should emphasize to management the importance of communicating and collaborating with employees to ensure mutual benefit during AI implementation.[33] Employees are generally more receptive to AI tools that simplify work, reduce menial tasks, and boost job satisfaction. A more collaborative approach ensures that AI integration aligns with worker expectations, potentially leading to smoother adoption and improved outcomes.

HEALTH AND SAFETY

Shifts in job content driven by AI tools have considerable implications for employee health and safety. AI-enabled technologies offer both opportunities and challenges in this regard.

AI and algorithmic systems can identify hazards, alerting workers to potentially dangerous situations before incidents occur. For example, AI capabilities are being implemented to improve compliance with health and safety protocols by prompting workers to conduct checks, or screening to ensure workers are adhering to personal protective equipment requirements.[34] Predictive maintenance software can analyse data to help identify malfunctioning machinery or equipment before incidents occur.

Some uses also incorporate facial and/or emotion recognition. Some tools identify customers implicated in previous thefts and/or violent confrontations, potentially improving staff safety.[35] In delivery and logistics, AI-enabled driver software systems can identify fatigue and nudge drivers by emitting a noise should they appear sleepy or lacking concentration.[36] While the EU AI Act (2024) restricts the usage of emotion recognition tools within the workplace, there are exemptions for health and safety uses.

However, close monitoring may also result in increased levels of stress and anxiety, further undermining the health and wellbeing of commerce workers.[37] For instance, growing concern over 'self-checkout loss' (including deliberate theft and accidental misuse) is prompting the adoption of enhanced analytics software. This claims to identify customers loitering near high ticket items, detect unscanned items and/or attempts to swap high value items for lower cost goods. However, this also has implications for workers. Staff are now expected to play a more active role in identifying and addressing theft, potentially leading to confrontations with customers.[38]

Alongside these job changes there has been a significant upsurge in violent and aggressive behaviour towards retail workers.[39] UK unions caution that 40% of retail workers are considering quitting due to escalating levels of violence, in part driven by confrontations over theft.[40] Increased levels of AI-enhanced surveillance are not providing adequate deterrence to protect workers from such incidents. Staff may be put at greater risk by being encouraged to confront customers identified (sometimes incorrectly) as shoplifters by technology.

On the other hand, some aspects of these changes have been welcomed. A reduction in cash handling has reduced an area of potential conflict that some staff found stressful.[41] As the cashier role has shifted, staff are now more technologically adept and have developed new skills. In addition, blaming problems on technology can help connect customers and staff, deflecting customer dissatisfaction.[42]

Apart from direct risks to health and safety, another area of risk relates to the potential effect of work intensification on worker wellbeing. AI tools for task allocation, performance monitoring, and customer personalisation and sales, can all lead to work intensification. Furthermore, such systems almost inevitably increase data collection and surveillance, which can have negative consequences for mental wellbeing. These technological risks are discussed below.

3.2.2 MANAGEMENT AND CONTROL

Many of the AI-enabled technologies covered in this guide are designed to facilitate employers' monitoring and control of workers. An increasing number of tools are emerging that automate, centralise or otherwise coordinate management tasks (Appendix 7.2). These tools impact the whole cycle of employment, including recruitment and scheduling, tasks assignment and direction, ordering and inventory management, monitoring and surveillance, and discipline/firing.

SURVEILLANCE AND CONTROL OF PEOPLE AND PRODUCTS

The AI-powered tools used to monitor workers can range from video surveillance within store, warehousing and logistics, to wearable devices used to track both performance and inventory. Constant monitoring has implications presenting both benefits and risks across a range of functions.

For example, inventory management systems often use cameras to monitor merchandise levels on shelves in-store. By streamlining and automating inventory management these tools can significantly reduce the burden of repetitive, time-consuming tasks like stock-taking.[43]

> *"They now use cameras that sit on the shelves to monitor stock levels. So instead of a colleague having to manually count stock and then decide how much they need, the technology alerts the stock take system and then it tells the colleagues. The idea is to reduce the workload in terms of managing stock onto the shelves and what's in the stock room and things like that. It also sounds an automatic alert when new stock needs to be ordered." (GMB, UK)*

These innovations offer the potential to optimize workflows and improve efficiency both in stores and warehouses. For commerce workers, these tools enable easy identification of short-dated items, limiting need for lengthy stock checks, while firms benefit from less wastage.[44] Staff can get support when dealing with customer issues via AI-powered devices and applications offering live detail about sales, promotions and stock availability.[45]

However, data collected for inventory management, task allocation and rewards (next section) can also be repurposed to monitor and discipline staff. Similarly, data collected for security and the health and safety applications, can also be used as evidence in disciplinary proceedings. So, while surveillance can boost productivity and improve safety and wellbeing, it can also have negative implications particularly when used for dual purposes.

Union reps should carefully consider these potential drawbacks and unintended consequences which may inadvertently create new health and safety risks or exacerbate existing ones. The use of wearable devices provides a useful illustration:

> *"In one of the warehouses, they've gone from having orders in an earpiece where they get told what the orders are to now having it on their wrist. It's like a scanner that sits on their wrist and tells them what*

the orders are, and they have to scan it when they pick. Initially we raised concerns around things like the impact on hearing health and now repetitive strain injury, given the weight of the scanner" (GMB, UK)

Monitoring itself may also negatively impact worker mental wellbeing. Studies indicate that monitored workers experience higher levels of stress, anxiety, and frustration towards a feeling of being micromanaged.[46] The intensification of workplace surveillance is accompanied by a reduction in worker autonomy. Increased scrutiny not only affects mental health but can also have physical repercussions. As a result, employees under constant surveillance have higher job dissatisfaction and quit rates.

CONTROL OF TASKS AND MEASUREMENT OF TARGETS

Across the spectrum of roles in the commerce sector employers are using AI tools to dictate tasks, routes and methods.[47] They are routinely used to specify optimum delivery schedules, pick routes and pick rates, and determine shelf-filling outputs to ensure maximum efficiency. While these initiatives build on existing approaches and technologies, they increase scrutiny of worker performance, with the goal of intensifying work.

"The effort required within each various pick rate pushes people to 90% effort and there's performance management processes in place. The employer is trying to squeeze as much as they can" (GMB, UK).

Many systems monitor individuals and attempt to pit workers against their peers, while others calculate performance collectively and shift-by-shift. While the latter is preferable, team targets can also result in performance management systems being triggered, and/or bullying and harassment for those failing to achieve the required outputs. Rates can fail to take account of real-world variables, for example, spillages in store, warehouse congestion or delivery drivers faced with locked gates.[48] Equally, workers will operate at different speeds due to individual factors such as mobility and strength. A lack of flexibility in pick rates can enhance workers' feelings of stress and pressure.

While targeting tools may be designed to drive productivity, applications can also extend beyond their original intent. Workers and unions should be aware of their multiple potential uses which have unintended or harmful consequences. Amazon's development of wristbands to monitor inventory and improve warehouse efficiency, serves as a useful illustration. The technology evolved to track workers' hand movements, 'nudging' them to be more productive, and even track break time.[49] Employees subject to such systems report feeling dehumanized and treated like robots.[50] While Amazon has since abandoned this particular system, it shows how tracking and surveillance tools can negatively impact workers' well-being.[51]

Amazon's other worker surveillance practices continue to come under fire, leading to a fine in France for excessive monitoring.[52] The company maintains that such scrutiny is essential for operational efficiency and inventory management and is appealing the decision. However, unions across Europe are pushing back against the expansion of these overly intrusive practices, citing detrimental health and safety implications.[53]

While AI can bring efficiencies, it also poses risks to workplace dynamics. Limited human interaction and using AI tools to indirectly manage workers can weaken meaningful relationships, undermining workplace camaraderie and work quality. The relationship between employees and their direct managers remains a critical factor in staff turnover, presenting both challenges and opportunities for firms leveraging AI for recruitment and retention.[54] Balancing the benefits of AI tools with the need for human connection is key to addressing these challenges effectively.

CONTROL OF HUMAN RESOURCE PROCESSES

The use of AI in HR processes is becoming increasingly common and is particularly attractive in high-turnover sectors such as commerce. AI tools are increasingly used for a range of functions in recruitment, such as proofreading job adverts for biased language, generating job specifications, shortlisting, interviewing and selecting candidates, as well as back-office functions such

Textbox 1 Work in the AI supply chain

Although AI supply chain workers like data labelers and content moderators are not directly part of the retail workforce, their work is essential to the functioning of AI systems in modern commerce. Despite this, their contributions remain largely invisible and are often not protected by adequate labor standards. To address these issues, it is important to demand transparency about how AI tools are developed and sourced, advocate for ethical standards and due diligence in AI procurement, and support global efforts to protect the rights of all workers involved in the AI supply chain.

as scheduling, payroll and customising development programmes.

In the retail sector, AI tools are increasingly being deployed to optimize two key areas: employee recruitment and workforce scheduling. For firms, predictive analytics are being employed in recruitment to identify the most promising candidates. AI-powered pre-employment assessments are providing insights into the skills and potential of applicants, while chatbots are now commonly used for CV screening. Advanced video analysis technologies are being applied to evaluate candidates' interview performances, by monitoring speech patterns and micro expressions (though the AI Act bans the use of the latter within the EU).[55]

Such AI tools are used to streamline hiring processes and make them more efficient, and to reduce human bias and improve retention. For example, Walmart implemented an algorithm that ranked candidates based on their chances of remaining in post for 90 days.[56] While the Walmart tool helped streamline hiring processes, some HR staff did not trust the tool's recommendations and bypassed them, potentially undermining the organisations objectives of making hiring 'data-driven' and less prone to human bias.

While these tools can potentially save time and minimise known human biases, they also carry risk. Reps should seek to ensure fundamental rights and principles are adhered to.[57] Poorly designed AI tools or biased training data can inadvertently lead to discrimination based on age, gender, or race, potentially infringing on workers' legal rights. This potential for discriminatory outcomes underscores the importance of transparency and human oversight in the use of these tools to ensure fair treatment.[58] Amazon's abandonment of an AI tool to screen CV's illustrates the potential for biased outcomes.[59] The tool reproduced the lack of diversity in their existing workforce by disproportionately screening out female candidates. AI hiring tools may also miss qualities related to employee performance that are hard to quantify and measure.

The 'black box' nature of many AI and ML-based hiring systems means that discriminatory impacts may be harder for employers and unions to spot, and decisions difficult for applicants to challenge.[60] This lack of transparency significantly impedes employees' ability to exercise their legal rights, challenge discriminatory outcomes or seek recourse when faced with potentially biased algorithmic decisions.[61] This makes the right of appealing any AI-based decision almost illusory.[62] Employees may also lack the means, knowledge, or power to contest unjust decisions.[63] Greater transparency and oversight is needed regarding how these tools work, the data they are trained on, the remit of the technology and the potential for inconsistency in their application to alleviate issues of bias.[64] Ensuring the magnitude of these risks are understood by management alongside highlighting alternative approaches should be key priorities for unions and reps.

AI-powered scheduling tools reflect similar patterns of opportunity and risk for workers and reps to consider. On the one hand, they could be used to ensure compliance with contractual and regulatory requirements, such as rest breaks and holiday entitlements. They can also potentially ensure appropriate staffing levels by optimizing staff allocation based on more accurate forecasting of customer demand, predicting when instore footfall, or, the volume of online orders, are likely to be higher. For delivery workers, tools can be used to optimise the routes taken, accounting for weather conditions, traffic delays and live rerouting to the best available options. They have the potential to improve vehicle usage, reducing the number of empty return journeys where possible. Likewise, these systems have the potential to address key issues in the sector, such as inflexible schedules and unpredictable work hours, which are major contributors to staff turnover.[65] AI tools have the potential to boost job satisfaction and retention while accommodating workers' personal commitments.[66] For example, open shift boards can enable shift swapping and incorporate mini-shifts, offering improved flexibility and allowing workers more control over their schedules.

However, without appropriate guardrails AI-enabled scheduling tools can have a detrimental effect on workers by subjecting them to precarious work patterns, infringing on workers' personal lives and contributing to an 'always on' culture. As AI scheduling tools respond to last minute absences and demand fluctuation, workers may be expected to check and respond to changing shift allocations and monitor employer communication when they are not 'at work'.[67] It may also not be clear what data is used to inform the allocation of shifts and whether factors such as staff performance are considered relevant factors.[68] To mitigate potential misuse, it is crucial to champion increased transparency and ethical practices. Implementation should strike a balance between employee welfare and operational needs, emphasizing job quality, worker well-being and work-life balance, while paying due regard to data protection requirements.

3.2.3 DATA USE: ETHICAL AND LEGAL CONSIDERATIONS

The use of data from workers and customers as inputs into AI systems, for purposes of control, discipline, and workplace optimisation, is growing rapidly. This

requires reps to carefully consider the ethical implications surrounding data usage and the secondary value it generates.

> *"Workplace data relations should be treated as an aspect of modern workplace conditions."*[69]

CUSTOMER DATA-GATHERING

The gathering and processing of customer data via AI-enabled systems can have indirect but significant implications for workers. Retailers are collecting customer data in a range of ways including in store surveillance and heat maps, via customer reviews and social media postings, and through loyalty cards.[70] Loyalty cards also enable growing integration of customer data from e-commerce and in-store purchases. Firms use this data to engage with customers in new ways and provide highly personalised marketing incentives.[71]

The use of AI for such purposes is subject to far fewer restrictions than for workers. For example, the EU AI Act largely prohibits worker facial recognition systems but does not impose the same restrictions for customers, especially for security and enforcement purposes. This raises concerns about the impact of 'dual-use' data on workers. For example, AI systems may be used to estimate the age of customers. However, if these systems accurately identify underage alcohol purchases that employees miss, could this be used to sanction workers?[72] There is a need for clear guidelines and guardrails on how AI-generated insights can and should be used.

A further illustrative example can be seen in the use of AI tools to identify suspicious behaviour. Retailers in the US are using CCTV data, facial recognition software and number plate recognition systems for customers to tackle rising levels of theft. Similarly, tools that use emotion recognition software may identify when customers appear angry or nervous. While data might initially be gathered to protect workers or prevent shoplifting, could it also be used to evaluate worker performance? Whether such applications are permissible in the EU remains uncertain, underscoring the importance of ensuring these technologies have clear and defined limits to address privacy concerns and safeguard consumer rights.[73]

PRIVACY, SCOPE AND TRANSPARENCY

Data protection issues and concerns around worker privacy are vital considerations when dealing with AI adoption. The data workers produce can be used in a multitude of ways. Ethical scrutiny should be applied to all uses of worker data to protect privacy, prevent potential misuse, provide clarity of collection purposes, and ensure fair treatment.

Acknowledgement of these fundamental rights may present competing considerations when assessing the impact of new AI technologies. The usage of 'Driver Distraction' software provides an illustrative example. While it can be valuable for enhancing workplace safety, emitting a noise to maintain driver alertness behind the wheel when workers seem distracted, it also raises important questions about data privacy and worker autonomy.

> *"I believe they are now being built as standard into lorries for our home shopping drivers, the big HGV lorries. Basically, it's a camera that is pointed at the driver consistently while they're driving, and it's designed to detect any indication that the driver might be getting tired. But, it's an infringement on the drivers' privacy. We're asking questions about how they're storing the data, and we're also obviously worried about whether or not it then starts to be used for disciplinary actions. We've asked them to carry out a data protection impact assessment. It's basically like a risk assessment that covers things like where the data is being stored. They've told us they've done that, but they won't share it with us" (GMB, UK).*

Such constant monitoring may infringe on employees' right of privacy, their sense of independence and workplace autonomy. In addition, the collected data may be used beyond its primary safety purpose, such as for performance management or disciplinary actions. Warehouse and in-store monitoring systems may work as deterrents against theft and other criminal activities, but may also lead employees to feel that their personal space and privacy is being encroached upon. Regular monitoring and clear lines of accountability are fundamental to ensure data protection requirements are being met.[74]

Beyond the issue of privacy, there are significant risks associated with the collection, scope and potential misuse of worker data. Whole Foods' (a subsidiary of Amazon stores) use of heat map technology illustrates these tensions. The company developed an AI tool to identify stores at higher risk of unionization by analysing factors such as racial diversity, employee loyalty, workplace safety, and local employment levels.[75] The system assigns risk scores to each store, allowing the company to allocate resources to pre-emptively disrupt unionization efforts. Such sophisticated data analysis techniques highlight the potential for data to be used in ways that may undermine labour relations. This practice

highlights the importance of understanding and scrutinising how worker data is being used.

As AI technologies spread throughout the employment lifecycle, it is increasingly vital to ensure AI is used appropriately and transparently, maintaining human oversight.[76] Given the diverse applications of AI tools, it is crucial to critically examine the quality and potential biases inherent in training data. If algorithms are trained on datasets that contain existing biases, they risk perpetuating and further embedding those prejudices.[77] This requires transparency in how systems are used and clear lines of accountability.[78] Firms may be reluctant to share this information, asserting that usage is covered by copyright, particularly if tools are owned by a third party.[79] As such, unions must seek to learn about the structure of the value chain for a given technology as it is being implemented.

4

UNION RESPONSES

Section 3 outlined the risks and opportunities posed by AI adoption in the retail sector. This section examines how unions can help ensure that the rollout of AI technologies doesn't come at the expense of job quality and worker wellbeing. First it outlines why collective bargaining over AI adoption is needed and highlights some of the challenges. Next, it illustrates some achievements arising from collective bargaining on AI drawing on recent union experiences. The section then sets out a roadmap for collective bargaining over AI. Finally, the potential of AI-powered tools for union organising is considered. Unions are experimenting with opportunities for AI to assist in areas such as negotiation and bargaining, communications, recruitment and retention. These are examined, alongside how AI may also assist challenges related to skills deficits, inadequate data and political barriers within unions.

4.1 ORGANISING FOR INCLUDING AI IN COLLECTIVE AGREEMENTS

AI tools are regularly incorporated into management systems in ways which increase managerial power and control. Even where AI systems seem mainly to target customers (such as in-store heatmaps), the data they gather and the recommendations and decisions they take impact employees – sometimes significantly. As such, AI threatens to tilt the balance between management and employees in ways which degrade job quality.

Collective bargaining frameworks present a key opportunity for trade unions to participate in the AI value chain while at the same time establishing guardrails to limit potentially negative impacts. Research shows that unions can play a significant role in positively shaping how technologies are adopted and implemented in the workplace.[80] Workers and unions can identify safeguards while optimising AI usage.[81] These are particularly im-

BOX 1

Ver.di's groundbreaking 2022 digitalization agreement with H&M was negotiated amid pandemic-driven online expansion. However, the firms desire to implement rapid technological change was slowed by existing Works Council agreements, alongside heightened tensions over workplace rights due to factors such as reduced commissions for store-based staff. Coupled with a strong union presence and well-organized membership ver.di was able to leverage tripartite negotiations between the union, works council, and management. Following six months of negotiations these unique circumstances led to the conclusion of a new Digitalisation Collective Bargaining Agreements (CBA).

Three years on, negotiations to secure an updated CBA are due to commence. Ver.di hopes to secure additional commitments for training/reskilling programs. They are hoping to empower workers to take a stronger lead while alleviating some of the more resource intensive aspects of the agreement. These ambitions will likely be countered by employer demands to accelerate the codetermination process and reduce bonus costs. While the final evaluation of the initial 3-year CBA was ongoing at the time of writing, this 'best practice' agreement highlights the importance of collaborative governance and worker participation in the implementation of technology.

"You need to explain to workers / members exactly what AI is. Be clear about how it affects them. Then they can understand why it is important to have a Collective Bargaining Agreement... You cannot avoid digitalisation so [you] need to help shape the process, be involved in the design." (Organiser, ver.di Germany)

Ver.di employed several strategies to help secure this agreement which may prove useful for unions attempting to navigate tech-driven transitions:

1. Preparation and awareness building (as a precursor to negotiations).
2. Joint and ongoing assessment and issue mapping to understand the risks and opportunities for workers
3. Clear goals and principles including joint participation, distribution of benefits and job security
4. Negotiate key provisions and key roles and responsibilities for parties, such as involvement in testing and the introduction of new technology, and training and reskilling
5. Ongoing monitoring, evaluation and dialogue as technologies evolve

portant to mitigate risks, limit work intensification and ensure the right to disconnect.[82] Employees can also assist with identifying potential areas for improving AI deployment, helping to shape the design and implementation of these technologies so that they serve to complement rather than undermine their roles. Unions can help ensure that AI integration benefits workers by advocating for transparent communication, inclusive adoption strategies, and proper regulation.[83]

By fostering a collaborative approach, AI implementation can both improve job quality and worker wellbeing alongside addressing operational issues. This approach is essential for tackling the risks and capturing the opportunities presented by using AI. In so doing this creates a work environment that prioritises employee interests while at the same time leveraging technological advancements. (Box 1)

However, so far, successful cases of union bargaining over AI technologies are limited. Our interviews indicated that in many cases unions are unaware of the precise technologies being used by employers. And it remains unclear how the often rigid and slow procedures associated with collective negotiations can handle the rapidly changing work environment produced by AI technologies.[84] While collective bargaining is a vital tool for reps and unions to engage with employers over the use of AI, only 20% of unions have collective agreements in place that cover AI.[85] Where these do exist, the main focus appears to be on training workers to use new technologies. Very few bargaining agreements cover data protection/privacy rights, worker surveillance, or AI's impact on recruitment or work organization – all key issues identified in the previous section.

Management is typically reluctant to involve workers in AI implementation and to maintain the 'managerial

BOX 2 Tuš union – Collective Agreement for Slovenia's Trade Sector

The recent experience of retail workers at the Tuš supermarket chain in Slovenia has some useful lessons in steps needed to run a successful campaign to negotiate a collective agreement. With the help of activists from the Centre for Social Research (Cedra), workers at Tuš – where conditions were reported as 'catastrophic' and unions were considered 'forbidden' – established a branch of the Trade Union of Retail Workers of Slovenia (SDTS) inside the firm. The union was successful in negotiating a sector-beating collective agreement including pay, work hours and flexible working. The three-year campaign involved:

1. Establishing a coordination committee to bring together the small and disparate memberships and coordinate activities;
2. Conducting a field campaign to Tuš branches across Slovenia to raise awareness of issues and build support;
3. Conducting a survey of Tuš workers and customers to establish appetite for Sunday closing and using the results to start a petition on the topic;
4. Further field campaigns to increase membership and build support for a strike;
5. Conducting press conferences to raise public awareness of workplace issues and gain wider support;
6. Campaigning among members and other Tuš workers to generate support for a strike;
7. Negotiations with management, in response to the threat of strike action, to achieve some immediate concessions to address key issues and gain agreement for further negotiations on a firm-level collective agreement;
8. Ongoing negotiations culminated in a collective agreement in June 2024.

The focus of the campaign was to raise wages above the minimum wage. While the collective agreement does not mention technology specifically, there are clauses around the use of temporary workers, limiting assignment to other stores and training. As such, the agreement may well protect workers from some of the flexibilization practices that could arise from the use of last-minute automated scheduling, the right to disconnect outside of work hours alongside provisions to ensure staff are paid for any training that may be needed to respond to technology adoption.

Source: Center za Druzbeno Razikovanje (CEDRA) (2024, 4 September). Our three-year struggle: Workers of the Tuš union: "Nothing about us without us!". www.cedra.si Accessed on 28/03/25 from: https://cedra.si/en/our-three-year-struggle

prerogative' over technology usage. Union interviewees from several countries noted how firms are actively blocking their involvement (Box 2)

> *"We try to negotiate with employers but they are resistant to discussing. We have tried to put it on the table for the last 4 years just to have a discussion, before even thinking about collective bargaining" (ACV, Belgium).*

Unions and workers can often feel intimidated by complex technology and terminology when dealing with AI and related technology. The challenge is to utilise collective bargaining procedures more proactively to foster a culture of bargaining over AI tools. As one commentator proposes, at "*the dawn of the automation and the AI revolution, unions have a new calling. They should stop trying to put out fires and, instead embrace a proactive, strategic approach*".[86]

Where hostility to information sharing from employers exists, unions can establish their own monitoring systems. A case from France shows how these can be scaled up from individual workplaces to the national level. The CFDT service sector union discovered that major employers such as Carrefour and Auchan had recently introduced AI products, including for HR purposes (such as CV screening and interview evaluation) and GenAI chatbots for staff to use in asking questions which arise on the job. There was concern about these tools, including around privacy, surveillance, and deskilling, alongside (a lack of) employer expertise and understanding of the AI tools.

Due to employer reluctance to share information and bargain over AI given these concerns, the union established a research program and network of activists to report on AI usage in retail. The network of activists (at company and regional levels) has established a monitoring system for AI tools being used and introduced in commerce, and members meet regularly to share information and feed it to the union headquarters. This is an effective way to collect information from employers given their hostility to sharing and bargaining. Results are also shared with researchers who are producing summary research reports on AI. This research is being used to formulate demands for employers during bargaining rounds. By the end of 2025, the union plans to call for national negotiations over AI to be led by this network. In the meantime, they are organising training for workplace activists on AI including the legal framework and key functions of AI technologies, alongside strategies to empower reps in technology related bargaining.

In other cases, existing collective agreements with technology components can offer effective AI bargaining frameworks. In Sweden, the Handels union bargains over AI tools using longstanding technology agreements. These make negotiation over the introduction of any new workplace technology mandatory. However, problems can still arise. In the commerce warehousing sector, the union has encountered several cases where third-party providers of AI technologies (such as robotics, picking systems, and warehouse management software) do not train or permit in-house workers to use their systems. As such, in the event of a failure, warehouse operations can stall or fail for substantial periods of time while a repair callout from the technology provider is awaited. A priority for the union in these cases is now to ensure that existing collective bargaining frameworks are used to secure training for workers on third-party systems during AI adoption.

4.2 EXISTING COLLECTIVE AGREEMENTS OVER DIGITALISATION AND AI

While collective bargaining and collective agreements addressing the use of AI tools in retail are still relatively rare, a number of recent experiences provide examples of achievements unions have made in negotiating over the use of new digital technologies in the workplace. These examples emphasise the importance of protecting workers' rights, ensuring transparency, and fostering collaboration. These agreements can be used to help inform the approaches and strategies that reps and unions adopt when negotiating with employers.

4.2.1 THE RIGHT TO DISCONNECT AND WORK-LIFE BALANCE

The *ITA Gruppo Telecom Italia collective agreement* signed in 2020 contains a number of clauses on working time and the right to disconnect. To promote 'well-being and work-life balance', the agreement upholds 'the right to disconnect from tools [of] technological work'. The right to disconnect is not formalised, but is based upon 'the sense of responsibility of the individual worker [and] colleagues', and during breaks 'the worker will not be required to receive or view any company communications'. Examples include using the 'delayed delivery' option and scheduling meetings 'in compliance with normal working hours', while instant messaging services are to be turned off during non-working hours. Working time is to respect 'maximum daily and weekly working hours deriving from the law and by collective... bargaining'.

Similarly, the *ESP Takeaway Express Spain 2021 (Just Eat)* collective agreement guarantees for workers 'the right to digital disconnection... outside of legal or conventional working time'. It ensures respect for 'rest time, permits and vacations', alongside 'personal and family privacy'. The Company 'does not make communications [to workers]... outside of their working hours' unless in 'exceptional circumstances'. Digital disconnection is recognised as a right which 'contributes to the health' of employees, by 'reducing... technological fatigue or stress', and 'improving... the work environment and the quality of work'.

4.2.2 TRAINING AND RESKILLING FOR AI TOOLS

In October 2022, the German trade union *ver.di* and clothing retailer H&M concluded the first ever collective agreement specifically focused on the use of digital technologies and AI in the retail sector, aiming to 'promote and protect the rights of 14,300 H&M workers in Germany over the next three years'. The agreement embeds employee participation 'before introduction or modification' of IT systems, via a 'Digital Advisory Board' and 'Digital Committee' in which workers and representatives participate. These groups assess digital technology's impact on 'tasks, work intensity, control and dependency, and health'. In pilot in-store workshops, employees collaborate with management to ensure 'human-centred design' and propose improvements in technologies. A mandatory 'evaluation aid' guides impact assessments of stress, pace, and performance metrics. If needed, a 'specification dialogue' defines improvements. H&M must disclose changes to the union, and digitalization becomes a 'constant negotiation process'. Protections specify that there should be no 'dismissals' or 'job downgrading' due to changes in technology, and employees have gained rights to update their skills to ensure 'qualified consultation and engagement'. Key provisions of the CBA include: *Job protections* – safeguards against dismissal/demotion and restrictions on temporary hires replacing permanent staff; *Financial incentives* – quarterly bonuses (€250) to offset lost commissions, ensuring worker buy-in; *Co-design and testing* – pilot workshops and advisory committees give workers a role in shaping tools and processes; and *Ongoing oversight* – biannual reviews and a dedicated digitalisation board ensure worker influence is maintained post-implementation.

The *European Social Partners' Autonomous Framework Agreement on Digitalisation* (2020) establishes joint principles for managing workplace digital transformation. The agreement stresses that 'social partners have a shared interest in facilitating access to quality and effective training' for AI adoption, requiring employers' 'commitment to invest in skills' and workers' engagement in lifelong learning. It mandates 'joint identification of skills needs' through social dialogue, with training preferably 'during working hours' and compensated if after-hours. The framework promotes 'a real learning culture in enterprises' blending technical and soft skills development. Crucially, it ensures 'workers' representatives are involved in all stages' of digital transition planning, from skills forecasting to training design.

4.2.3 EMPLOYEE PARTICIPATION IN AI IMPLEMENTATION

The 2022 *Territorial Collective Agreement* for packaging co-operatives in Cuneo (Italy) places employee participation and consultation at the centre of how firms implement digital change. It states that, 'in light of the major [technological] transformations taking place', the parties consider 'the organisational participation of... workers both on internal processes and on the strategic lines of companies to be fundamental'. When companies plan to adopt 'robots/cobots and/or AI', they are required to 'inform the Company Trade Union Representatives... prior to their adoption', detailing 'the type of innovation, its essential technical components and its expected impact on the production cycle'. For AI products, the company must also disclose 'the type of data they are called upon to collect,...the times and modes of data retention', and 'the purposes of their collection'. The agreement also establishes principles including 'the need for human control to persist', the 'reliability and verifiability of data' and recognition of the worker as a 'user' of AI systems when relevant to their tasks and responsibilities. The aim is to ensure that innovation is implemented in ways that are transparent, participatory, and attentive to workers' roles and rights.

4.2.4 FAIR AND TRANSPARENT AI IN EMPLOYMENT

IBM Germany and its Group Works Council in 2020 agreed on a joint framework with the *ver.di* union for AI use, striking 'a balance of interests' between company goals and employee rights. AI must support 'data-based decision preparation', but 'never replace human decision-making'. Systems are classified from 'no risk' to 'very high risk', with category 5 (automated personnel decisions without benefit to employees) strictly prohib-

ited. AI must meet standards of 'transparency', 'non-discrimination/fairness', and include a 'feedback loop' to correct errors. An 'AI Ethics Council' reviews high-risk systems. Employees retain rights to correction and may not be monitored for productivity using AI.

The *Managing Technology that Manages People* guidance (2024), issued by the Workforce Partnership Council (a body including the Welsh Government, public sector employers, and trade unions), establishes that 'public sector bodies have a legal duty to operate in social partnership with their unions', including in decisions about the adoption and use of algorithmic management systems. Worker representatives must be involved 'before adoption and implementation', during procurement or development, and in the ongoing governance of these systems.

Guidance states that 'social partners should engage with dialogue and decision-making' from the earliest stages, including a 'full audit of where algorithmic systems are already in use'. This audit must produce a 'comprehensive record... made freely available to all members of staff', and must trigger consultation if any systems are in use without clear agreement. During procurement, unions must be consulted through structured tools like the Algorithmic Transparency Recording Standard, and they must be involved in 'Data Protection Impact Assessment[s], Equality Impact Assessment[s] and Algorithmic Impact Assessment[s]', with results shared transparently. Worker representatives are 'key stakeholders' in the AI development and implementation process, with a central role in 'enabling the wider workforce to understand and offer feedback', and 'facilitating and supporting implementation'. To do so meaningfully, they 'may require external advice or training', which should be supported with time and funding.

After implementation, the guidance states 'algorithmic management systems must be subject to effective monitoring', with regular feedback from workers and representatives used to 'shape the ongoing use of any system'. It guarantees 'periodic access to the system' for workplace representatives and affirms that organisations must remain 'open to pausing or halting the use of the system entirely' if risks cannot be managed. To ensure meaningful human involvement, the document requires both a 'human in command'—a senior manager trained and accountable for system oversight—and a 'human in the loop', so that 'decisions that have significant effects for an individual are subject to active human involvement'. Workers must retain 'the right to raise concerns about a system without suffering any detriment', and to receive 'a personalised explanation of any significant decision made... in advance of that decision taking effect'. Through this social partnership model, the guidance embeds employee voice and joint governance into the design, deployment, and monitoring of algorithmic systems to ensure fair and transparent outcomes.

4.2.5 DATA PRIVACY AND WORKER SURVEILLANCE

A *Swisscom* agreement on data policy from 2018 commits that the employer 'respects its employees' privacy' and processes only 'anonymised personal data', ensuring compliance with 'data protection law, the code of obligations and employment law'. Data processing must be 'legal and legitimate', not used for 'monitoring employee behaviour' or 'effecting a productivity increase'. Employees must be informed personally, clearly and transparently of the data sources, purposes of processing, procedure, consequences, recipient categories and storage location of data processing. Consent, when required, must be 'voluntary' and valid for a 'maximum period of two years'.

Deutsche Telekom's 2023 AI Manifesto, negotiated with ver.di and the Group Works Council, sets binding rules on AI use to protect employee privacy and limit surveillance. It bans autonomous machine decision-making in personnel matters and prohibits AI systems from monitoring behaviour, controlling performance, or influencing employment conditions. AI tools cannot collect sensitive data such as political beliefs, union membership or health status. A risk-based framework blocks high-risk applications like surveillance or systems affecting pay. Lower-risk tools require works council approval through new agile procedures. Ver.di holds veto power over non-compliant systems, ensuring strong oversight and negotiated safeguards.

4.3 ROADMAP FOR COLLECTIVE BARGAINING OVER AI

First, this section summarises several recent reports and studies to present seven key principles for a worker-friendly AI rollout.[87] We distill these from UNI Global Union's Top 10 Principles for Ethical AI, among other sources.[88] Next, it provides a roadmap for how unions can embed these principles in monitoring existing technologies and managing the rollout of new AI systems. It draws on best practice and incorporates case study examples. (Box 3)

While they may appear ambitious, experience increasingly shows these principles can be achieved through collective negotiations with employers. Below is a

BOX 3 Seven key principles for worker-friendly AI

1. Inclusive design and development
AI technologies should be designed and developed with workers interests in mind, and with consistent and direct union involvement from the earliest stages of system design, procurement, and testing. Ensuring meaningful participation strengthens legitimacy, trust, and practical effectiveness. The gains from introducing AI should be shared with workers.

2. Transparency, explainability, and non-discrimination
AI should make decisions based on transparent criteria. AI should incorporate audit logs, and decisions and recommendations should be traceable and explainable to the workers it impacts. Decisions and recommendations should be regularly audited to ensure they do not reproduce gender, racial, or age-based discrimination and support fair outcomes for all workers.

3. Upskilling and autonomy
AI should, wherever possible, be used to increase worker skill levels and/or to improve job quality. Workers should have co-ownership over company data which they help produce. Where tasks or roles are displaced by AI, workers should be supported to reskill for complementary roles with equivalent or higher skill levels.

4. OSH and rights-enhancing
AI technologies should be used to reduce OSH risks, not in ways which generate new hazards or risks (including workplace stress). AI technologies should, where possible, enhance worker rights, including the right to organise at work.

5. Oversight and accountability
Human oversight must be a consistent, not sporadic, feature of AI systems. Clear lines of accountability for AI recommendations and decisions should be drawn up in advance of deployment, with pre-defined oversight mechanisms at either sectoral, national, or company level. These should identify where responsibility for error or discrimination lies with AI vendors, or with management. Workers should be insulated from the risks associated with AI-generated mistakes, and whistleblowers should be guaranteed protection.

6. Data privacy, security, and control
AI systems must handle workers' personal and collective data with care. Data should only be used for specific purposes with clear consent. If customer data is used to manage staff (e.g. for performance tracking), workers must be informed and give approval. Workers should have the right to access, review, and control how their data is used — and to withdraw consent for non-essential monitoring without penalty.

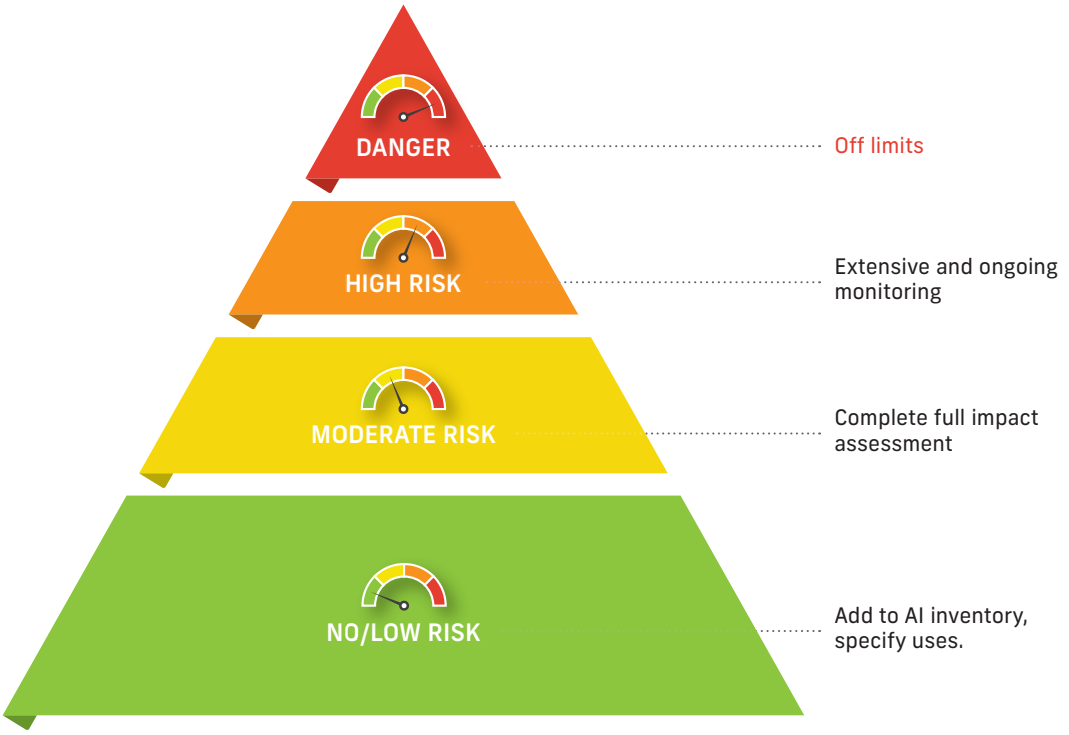
7. Right to appeal and human review
Workers must have the right to challenge AI decisions, and receive a timely explanation and review by a qualified human based upon audit logs. Automated decisions affecting work processes, performance evaluation, scheduling, or employment status should never be final without the option of meaningful human review and established appeal mechanisms.

roadmap for how AI technology can be introduced in an inclusive way. Five key steps are presented, illustrated (where possible) with concrete examples of how unions have embedded these principles in collective agreements.

1. Agree a transparency and disclosure agreement with employers.
A transparency and disclosure agreement should commit management to collaboratively compile an inventory (to be regularly updated) of all AI technologies in use in the workplace. The inventory would assist the union in mapping the tools that are being used in the workplace, and to understand their aims, remit and impact.[89] All new tools would need to be added to the inventory.

The UK's Public and Commercial Services Union's (PCS) model agreement on AI states that: 'new AI systems should only be introduced following consultation and agreement with the union. And all existing AI systems should be disclosed to the union.'[90]

Figure 2: AI evaluation process for collective bargaining



Source: Draws on ver.di union's AI Manifesto, an agreed procedure for works' council bargaining with management at Deutsche Telekom.

2. Devise a core principles charter and a risk framework.

Core principles governing the introduction of new AI technologies (as listed above) should be specified, agreed, and written into a bargaining agreement.

A risk framework should be drawn up between management and the union to identify whether technologies deviate from these principles, and if so, to what degree. For those technologies which threaten to deviate either moderately or significantly from agreed principles, more scrutiny and potentially an independent agreement on legitimate uses should be required. This will avoid devoting union resources unnecessarily to low- or no-risk applications, or, imposing unnecessary restrictions on the firm, while encouraging management to reconsider introducing technologies which risk degrading job quality or content. (Figure 2)

Once a transparency and disclosure agreement is in place, and core principles and a risk framework for new AI technologies have been agreed, new technologies can be introduced assuming they pose no/low risk of infringing agreed principles and are added to the inventory.

When introducing new AI technologies which fall under the moderate or high-risk categories, these subsequent steps can be followed.

3. Establish need, core functions, and risk level for new technology/ use case.

Management should demonstrate why any AI technologies are required for business purposes. Their core functions and data sources should be clearly communicated to worker representatives, and an impact assessment conducted with results presented to the union and worker representatives for analysis.

The Canadian Public Service Alliance recently concluded agreements including the clause that "the business case and all other documentation that demonstrates the need for the technological change and the complete formal and documented risk assessment that was undertaken as the change pertains to the employees directly impacted, all employees who may be impacted and to the citizens of Canada if applicable, and any mitigation options that have been considered."[91]

4. Co-purchase and/or co-design.
Once a need has been established, a business case presented, and an impact assessment conducted, unions and shopfloor workers should be consulted to confirm that tasks in question could effectively be assisted by an AI application. Testing should ideally take place through a pilot or sandbox monitored by the union. Union representatives should be involved in the purchasing process, or if it is designed in-house or collaboratively with the vendor, be fully involved in such discussions over design process. As noted in section 2.3, the development of AI systems often relies on an army of data workers, often on low wages working in the Global South (see Textbox 1). Worker representatives and management should ensure ethical sourcing practices when identifying an AI vendor. Once agreed upon, technology should be implemented collaboratively.[92]

The UK's Communication Workers' Union 2018 agreement on AI with Royal Mail states that the firm and union: "*will consult fully on the aims and objectives of proposed new methods, technology or automation at the concept design stage. A trial will be designed to seek to validate the proposed change. A terms of reference will describe the content, location and success criteria. Timescales for the trial should be expedient and will not exceed 90 days. When success criteria are demonstrated as met, this will trigger deployment, subject to business case approval. The consultation will take place at the national level and early enough to allow meaningful input/involvement in shaping the most appropriate trial that will meet the stated objectives, prior to any business case being concluded.*"[93]

Textbox 1 Work in the AI supply chain
Although AI supply chain workers like data labelers and content moderators are not directly part of the retail workforce, their work is essential to the functioning of AI systems in modern commerce. Despite this, their contributions remain largely invisible and are often not protected by adequate labor standards. To address these issues, it is important to demand transparency about how AI tools are developed and sourced, advocate for ethical standards and due diligence in AI procurement, and support global efforts to protect the rights of all workers involved in the AI supply chain.

The AI Action Summit in Paris saw 70 employers sign a declaration, which committed, among other things, to help uphold: "global standards for all data supply chain workers, notably in data enrichment work, including living wages, healthy and safe workplaces, and fundamental labour rights."[94]

5. Ongoing feedback, adjustment, intervention.
Unions should be afforded a venue by which to feedback worker comments and concerns on AI applications in use, with management formally responding on adjustments made to technologies in response to comments.

In a branch of the UK supermarket ASDA (Normanton), the GMB union established 'circles of improvement' for workers and the union to communicate with management around technological innovation, including usage of AI.[95]

Workers and unions should ensure they retain control over the individual and collective data generated for and by AI systems in order to enhance job quality. Workers must have the right to access and correct personal data collected or inferred by AI systems. AI surveillance systems must be proportionate – respecting workers' dignity, privacy, and fundamental rights – and must not be implemented without prior consultation and consent from trade unions or worker representatives. All AI tools used in recruitment, performance evaluation, or disciplinary decisions must be subject to regular, transparent bias audits, with worker representatives informed of the results.

Workers and unions should also secure regular exchanges with management around clear and timely information about the use of AI systems in their workplace, including details on what technologies are used, for what purpose, and how they may impact employment or working conditions. Workers must be able to challenge any AI-influenced decision, request a human review, receive an explanation, and seek correction or reversal if the decision is unfair or discriminatory. In some circumstances, National or European regulation, such as the right to a human review in Article 22 of the GDPR, may provide rights that could be used to support this.[96] Finally, workers and their representatives should have access to expert advice, including union advisors and external specialists, to assess the technical, ethical, and legal impacts of workplace AI systems.

4.4 OTHER STRATEGIES

Beyond collective bargaining, unions and reps need to consider what other mechanisms can be used to leverage input. Unions have been actively engaging with the use of AI, data rights and issues such as algorithmic management in several ways including policy development, regulatory proposals and consultation demands.

4.4.1 SKILLS

AI-powered technologies will require many workers to develop new and different skill sets. To ensure workers remain AI literate in a period of rapid technology change and adoption, they will also require continuous re- and up-skilling initiatives. Unions have an important role to play in helping alleviate digital skill gaps and other divisions which are likely to impact workers.

> *"They [union members] are very anxious to be critics. When the system has already gone through x pilot who are we to comment? We have to have training [about AI] ... to try to empower our members" (Unia, Switzerland)*

First, unions can push for collective agreements to include upskilling clauses to ensure that AI-related technological developments do not leave workers behind (see above). These will vary considerably by industrial relations system, but could include a mix of on-the-job training for new technologies, funded courses for skill accreditation (during working hours), and funded sabbaticals for self-directed learning and upskilling. When bargaining over reassignment/redeployment clauses for jobs disrupted by AI, unions could consider pushing for preservation of skill level in new posts. The European Social Partners' Framework Agreement on Digitalisation commits employers and unions to collaborate on skills plans which ensure workforces are included in technology changes in a positive way.[97]

Beyond workplace and sectoral bargaining, unions could pressure governments for policy support to invest in lifelong learning initiatives, with an emphasis on digital and green transitions.[98] Policies should be supported which commit employers and governments to bear the burden of training and reskilling workforces impacted by AI. Governments have a role in encouraging the use of technology with open standards, through technology-neutral skill accreditation schemes. They should also encourage the development of accreditations that are acknowledged nationally to maximise workers' employability.

Second, unions can commission regular sectoral technology reviews and foresight analyses for AI and related technological changes. These can identify key AI technologies which are being introduced or are likely to be in the near future, consider their implications for skills, and help unions, employers and workers prepare. Regularly evaluating workers' skillsets and training requirements in partnership with employers can help both secure a just transition as AI technology is implemented.

4.4.2 IMPACT ASSESSMENTS AND AI AUDITS

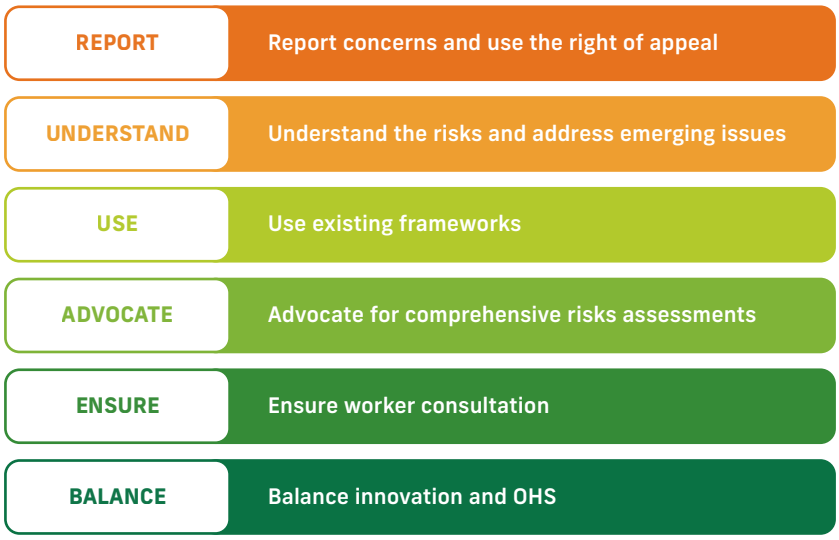
Given the implementation of tech is often decided centrally by management, where reps have limited influence, strategies to influence decisions at the firm and workplace level are also necessary.[99] Using every possible avenue to influence decisions, will help ensure that worker's voices are heard. This might mean: using existing rights to consultation; pushing for voluntary agreements that include provisions on the implementation of tech; and building relationships with key decision makers.

Union representatives in the retail sector can use existing EU occupational health and safety (OHS) standards to protect workers from risks associated with AI tools. The European Framework Directive 89/391/EEC establishes general principles protecting workers' rights to healthy and safe working conditions. It affords workers the right to be informed, consulted and protected, requiring employers assess and mitigate workplace risks, including those introduced by new technologies.[100] Article 6(1) specifically obliges employers to account for changing circumstances, such as the adoption of AI tools, while the 23 associated OHS Directives may cover specific risks and functions relevant to the tool being deployed.

While the thresholds for implementing health and safety committees vary across Member States, where required, unions can use these forums to address OHS issues. AI tools used in worker management, such as monitoring compliance with safety protocols or allocating tasks, or those that impact broader occupational health concerns, fall under the purview of these regulations. Health and safety committees can assess potential risks, ethical concerns, and compliance issues related to these tools while also advocating for proper training and oversight.

Union reps are well versed in using risk assessments. By simply refocussing their attention they can use these skills to understand potential risks and hazards in terms

Figure 3: Using OHS frameworks



of both physical and psychological impacts. Figure 3 highlights key issues for reps to consider.

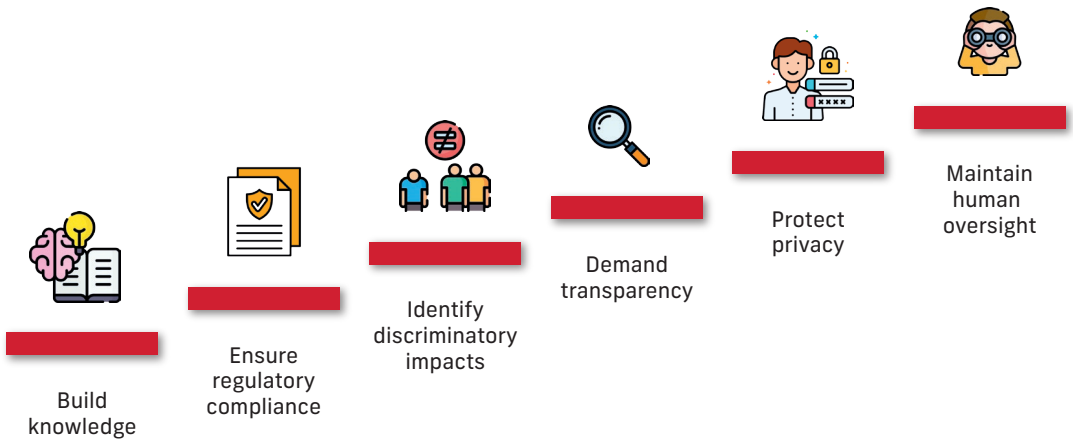
Reps can use risk assessments to help safeguard workers from the risks posed by AI tools. By leveraging these regulations, they can promote active worker involvement in safety discussions, ensuring appropriate training and equipment are provided, and to monitor how AI systems impact working conditions. The risk assessment process lends itself to the need for continuous improvement associated with this ever-changing landscape. This gives reps the opportunity to protect workers safety and wellbeing while enabling innovation. Where new risks and threats to the working environment are identified unions can advocate for stronger OHS protections to deal with these emerging challenges.[101] Should reps encounter resistance in this approach or where protection is inadequate, they can use the right of appeal and/or report to national labour inspectorates, who have a role in overseeing and enforcing the Framework Directive.

Unions can further build on these skills by encouraging the use of Algorithmic Impact Assessments (AIA) when new technologies are being introduced. Similarly, they provide a formal process for unions to have input into design and implementation.[102] Increasingly viewed as a valuable tool, they assess how systems will be used beyond health and safety impacts.[103] While their methods, scope and purpose remain undefined,[104] AIA's provide a structured approach for assessing the societal impacts of systems. For employers they can help build trust in the use of systems, ensuring greater accountability for the design and deployment of AI tools, mitigating harms and maximising benefits.[105] Reps can use AIA's as an additional mechanism to widen the scope of their input, safeguarding workers' rights and helping to ensure fair and equitable AI adoption.[106]

To complement the use of AIAs, unions should also encourage employers to conduct regular AI audits. An AI audit is a thorough review of an AI system to identify risks such as bias, data privacy issues, and unfair surveillance that could affect workers. They provide a way to ensure the technology is transparent, fair, and complies with legal and ethical standards. Regular audits can help maintain transparency about what data is collected, how it is used and who has access, helping to ensure technologies do not infringe on workers' rights. Audits can also provide a mechanism for unions to promote ethical standards in the sourcing of AI services, including advocating for suppliers who uphold strong labour practices.

Given the necessity for these approaches, developing expertise is a critical step for unions to help leverage input as key stakeholders. Building know-how is a valuable asset as employers may themselves struggle to keep pace. Unions can highlight best practice approaches and the importance of compliance with appropriate regulatory standards. Identifying potentially discriminatory effects will help ensure workers are treated fairly while avoiding costly litigation for employers. In light of these risks, unions can use AIA's to demand transparency and clear explanations of how systems work. These mechanisms can help protect workers privacy, ensur-

Figure 4: Six step approach to AIA's



ing compliance with data standards related to the GDPR while preventing the collection of unnecessary data. As a failsafe measure and to help mitigate harms unions should push for human oversight in decision making processes and maintain the right to challenge AI based decisions. These steps are summarised in Figure 4.

Where reps are not part of the AIA process, their efforts should focus on ensuring that findings are shared with unions while continually advocating for a seat at the table.

Litigation can also be a useful strategy. The AI Act and Platform Work Directive offer valuable protections for workers with provisions concerning human oversight, impact assessment, rights to information and algorithmic transparency. Unions will no doubt be looking for strategic litigation to establish favourable interpretations of these new and emerging legal rules and precedents.

Unions and reps have a key role to play when it comes to new technologies in the workplace. In order to do this unions need to be able to spot issues, understand the implications and come to the table with informed proposals. To position themselves as valuable partners developing expertise is a critical first step.

4.5 AI FOR ORGANISING

Just as AI offers benefits to employers, these technologies can also be put to use by unions.[107] However, unions are predominantly treating AI as an external challenge rather than exploring how AI can be leveraged internally to strengthen their own operations and strategies. AI capabilities can do things like analyse worker feedback and build power through data-driven insights. For unions, collecting this data has the potential to document working conditions, presenting opportunities to ask questions and build power.[108] Technologies could assist with meeting balloting thresholds, enhancing workplace campaigning, and the ability to represent workers' interests.

> *"One of our policy statements, is that every time we gain an efficiency it should come back to the member... member contributions don't need to increase if we can reduce our costs." (FNV, Netherlands)*

Just as AI is a useful tool to boost capacity across sectors, campaigning organisations like political parties are increasingly using these tools to personalise and tailor content to their audience, helping to increase engagement.[109] While the adoption and utilisation of AI is in reality fairly limited amongst trade unions, we now present some examples of how AI can be used to support unions and discuss some issues that unions need to be aware of. We then move on to elaborate the risks and barriers they are likely to face when pursuing these goals.

4.5.1 OPPORTUNITIES FOR UNIONS

Digital tools have the potential to empower workers and community groups to better understand their rights, monitor their working conditions, and build collective identities. Online resources can help workers and reps understand their legal rights, building workplace strength.

There is a growing number of firms developing digital tools aimed at empowering workers. Resources are being developed to help unions and worker representatives navigate challenges related to the adoption of AI and other digital technologies. For example, technologies can be designed to help reps understand and manage how worker data is collected, used, and protected in the workplace. This is vital and can encourage reps to proactively engage with data-related issues. Digital tools can be used to map the technologies workers encounter, such as access systems, computers, wearable devices, and surveillance equipment, while also identifying potential issues such as privacy concerns.

The organisations helping unions navigate the AI landscape in this way are also identifying important strategic areas for technological transformation and change. For example, unions need to adapt their communication strategies to stay relevant and effectively connect with members.[110]

> *"We are making podcasts, we are on Facebook, BlueSky and TikTok. We are trying to have an evolution" (ACV, Belgium).*

Traditional media like print and broadcast are reaching smaller audiences, making it essential to embrace modern tools, including AI and social media.[111] By leveraging digital platforms for storytelling and rapid information dissemination, unions can engage members, understand their concerns, and tailor campaigns to resonate more strongly. Analysing data from these interactions could allow unions to build effective strategies, strengthen advocacy, and remain impactful in a digital-first world.

It is worth also considering examples of what can be achieved when unions decide to invest in these technologies.[112] Digital tools can assist in organising efforts, supporting, rather than replacing, personal connections between union reps and members. For instance, technologies can be leveraged to help create adaptable communication strategies, facilitate real-time coordination during industrial actions, enabling tracked and personalised member engagement.

During critical campaigns such as strike ballots, technologies can enable organisers to easily monitor conversations, direct members to appropriate resources, and ensure timely follow-ups. Direct and targeted messaging can significantly increase engagement rates, helping to drive turnout and meet balloting thresholds.

Tools can be used to and identify trends, recommend organising activities and analyse member feedback. They can predict potential membership churn risks enabling unions to implement more proactive retention efforts. In turn these technologies can help free up time from administrative tasks, enabling reps and organisers to focus on campaigning and organising goals. These kinds of technologies are increasingly being developed with social justice pricniples in mind, directly supporting the core goals of unions while building organizational strength.

CHALLENGES FOR UNIONS

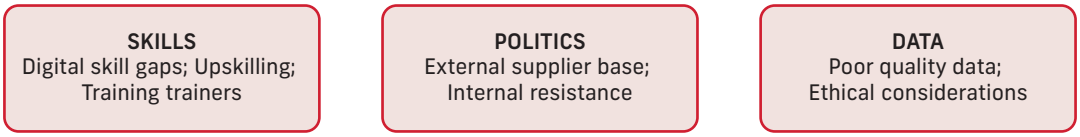
While the potential is huge, in order to navigate a path to successful and ethical adoption of AI unions need to understand the specific challenges they face, summarised in Figure 5.

Skills

First, unions need to build capacity and digital know how. Research shows, perhaps unsurprisingly, that technology companies and management perspectives dominate debates around AI.[113] The absence of civil society actors ensures that this discourse and the advances it brings, are not being considered from a worker's point of view. Union actors need to get involved in shaping how AI is used in our workplaces. However, there is a significant skills gap in the labour movement when it comes to understanding and using these technologies.[114]

> *"The union and politics don't know anything about what is happening, they don't understand the risks of robotisation and AI." (European Works Council, Italy).*

Figure 5: Union challenges



If these skills gaps are not addressed there is a risk that unions will be left out of important decisions that affect jobs and working conditions. By building tech skills unions can stay relevant as the world of work changes, both by securing a voice in these debates, but also in enabling them to benefit from technological advancements.[115]

Data-driven labour organising could be a powerful tool for the labour movement, but unions need to ensure there is technological knowhow to do the work. To democratise the use of data, comprehensive training and education programmes are required for everyone in the union, from reps to union staff, organisers and management.[116]

> *"We have a data and AI literacy program for the next three years to make sure everyone has the opportunity to be data and AI literate within that time. Some people can get more training depending on the role they have. We have a plan, commitment and budget" (FNV, Netherlands).*

Training needs to move beyond theoretical insights to more practical, empowering approaches that provide actionable skills and direct workplace relevance.[117] Continuous upskilling and ongoing investment is critical in this rapidly evolving field, however, evidence of such training is limited.[118] Some commentators have noted that unions often adopt a *wait and see* approach to new technologies.[119] However, without sufficient digital literacy within the labour movement, unions risk bypassing any meaningful involvement and being left out of important decisions that affect workers.

Political

The importance of capacity building brings us to the second key challenge unions face. While unions have spent their history fighting against risks of bias, they need to confront both external and internal political challenges associated with the adoption of AI.

> *"There's resistance. I see a large number of people not wanting to make the step towards it, reluctant to even look at it – fear of something new and an unfamiliar work environment, maybe to lose your job. But the other perspective is AI is here to stay and if you don't embrace it others will and you may be out of a job." (FNV, Netherlands).*

Deeply held assumptions need not be insurmountable barriers. Externally, unions need to understand the remit and limitations of the tools they are using. Unlike in other sectors, where there is a burgeoning marketplace of consultants offering a portfolio of products designed for the needs of specific industries, the supplier base for unions is more limited. Unions need to understand the political leanings of existing large language models[120] and remain alert to the risks of internet trained bias.[121] These tools can reflect not only the bias of the data they are trained on but are shaped by the developers that have produced them.[122] While there is a current gap in the market, requiring AI tools crafted for unions not management, alternatives are available.[123] For example, the Change Agent[124] is a bespoke large language model that is trained towards progressive politics, aligning products with the needs of the civil society organisations and marginalised communities.

Internally, it is important to ensure that scepticism about AI and limited digital capabilities do not hinder the potential for innovation.[125] While support networks to drive innovation are commonplace within business and government, unions typically do not have digital transformation teams. Despite financial constraints and the long-term challenges unions face, engaging with and investing in AI capabilities remains crucial. While not a magic bullet, AI offers valuable opportunities for recruiting, organising and maintaining relevance as the world of work evolves.

Data usage

Third, and relatedly, unions need to understand the importance and potential of data.

> *"The informing capacity of data does not necessarily belong exclusively to management"*[126]

Unions have a wealth of existing resources at their disposal. Membership data can be used to indicate levels of engagement, tracking participation at various levels, alongside showing membership and retention trends. Insights from collective bargaining agreements and contract negotiations can be used to create a dashboard of working conditions, to help inform negotiations and plan targeted recruitment campaigns.[127]

Various digital tools are emerging that can significantly enhance union organizing efforts by leveraging data and technology.[128] These tools offer customizable, AI-powered solutions that enable unions to efficiently capture, report, and track workplace issues.[129] By transforming worker experiences into strategic insights, these platforms amplify worker voices and generate data-driven intelligence about workplace trends.

This provides unions with innovative pathways for organising and engaging with members. Some applications allow workers to independently track important aspects of their work life, such as working hours, breaks and unpaid labour. By collecting and analysing their own data, workers and union representatives can identify unfair treatment and workplace issues more effectively. This data-driven approach empowers workers and unions to drive change, ensuring they have an evidence-based understanding of key workplace issues and how these are evolving over time.

However, the data challenge is not just about recognising opportunities, but also dealing with barriers. Many unions operate with outdated technology, making it difficult to implement new data management tools. Integrating new programs with existing legacy systems is often a significant hurdle for unions. Dedicating resource to enhance the knowledge base within unions needs to go hand in hand with investment in systems that are fit for purpose.

Unions also handle sensitive member information, making data protection paramount. Systems need to be GDPR compliant, maintaining privacy and transparency standards. To ensure ethical and effective data management, unions can use tools like Lighthouse's digital governance test to assess data practices.[130]

By addressing challenges and implementing best practices, data can be a powerful tool for union organising, helping to build worker strength.

5

CONCLUSION

This guide has described the many new and established use cases for AI in the retail sector. In section one, we introduced AI and briefly described recent advances in the field. Section two provided a simplified description of terminology related to AI and answered a series of key questions. The report pointed out a contradiction: while AI is often unreliable for anything beyond basic or repetitive tasks, its applications are rapidly growing. This is because the AI industry is experiencing a massive investment boom. Tech companies have spent huge amounts on software, hardware, and data centres in recent years, and they now need to find as many ways as possible to make money from these investments. This has led to a lot of hype around AI, which is especially attractive to managers in the retail sector in helping to address the tough economic challenges they face.

Section three began by providing an overview of key technologies that retail staff are either encountering or may expect to in the near future, before outlining general risks and opportunities presented by the introduction of AI in the commerce sector. AI applications often have significant implications for workers, driving changes in the skill content and dynamics of work, sometimes dramatically. Staying vigilant to these challenges and opportunities equips union reps to better support and advocate for workers.

Section four outlined principles for bargaining over AI technologies in the retail sector. It presented a roadmap for how unions can collaborate with management to introduce new technologies in ways which do not undermine, but rather preserve or enhance, job quality. It further highlighted the other strategies unions can adopt to secure a seat at the table, leveraging EU occupational health and safety regulations, pushing for Algorithmic Impact Assessments (AIAs) and pursuing strategic litigation. It further explored some of the more creative ways unions are themselves beginning to incorporate AI tools in their organising and negotiating work, which could potentially be adapted by UNI Europa affiliates to support their work.

While the narratives of AI transformation are often overstated, the core message of this guide is that AI is not magic. It is a technology like any other – that can be understood, bargained over, regulated and utilised for negative or positive purposes, depending on context. The role of unions in deciding which path we embark upon will be crucial, because regulation alone has not and likely will not meet the challenge. We hope this guide can make a modest contribution to ensuring AI is deployed safely, effectively, and in ways which enhance working life for the majority.

6

RESOURCES

Useful resources to help build effective organising strategies and leverage and campaign for change.

UNI Europa database of AI and algorithmic management and collective bargaining agreements: https://www.uni-europa.org/news/a-database-of-ai-and-algorithmic-management-in-collective-bargaining-agreements

Algorithmic Management: A trade union guide, UNI Global Union: https://uniglobalunion.org/wp-content/uploads/uni_pm_algorithmic_management_guide_en.pdf

Negotiating the Future of Work: Automation and New Technology | TUC includes examples of union action: CWU's agreement with Royal Mail Group on technology implementation; Unite's automation campaign across various sectors; EVG union's Work 4.0 agreement with Deutsche Bahn in Germany; Partnership Council working in Wales to develop principles on digitalization.

A paper on Deutsche Telekom https://pmc.ncbi.nlm.nih.gov/articles/PMC10941644/

Public Services International Digital Bargaining Hub: https://publicservices.international/digital-bargaining-hub

Joint declaration on the responsible use of AI in the workplace at the Norwegian Minister of Digitization, Nikolai Astrup: ansvarlig-bruk-av-kunstig-intelligens-i-arbeidslivet-erklaring.pdf

Unite the Union Model Agreement on AI: https://www.unitetheunion.org/media/3wepvt3h/artificial-intelligence-a-guide-and-model-agreement-for-officers-and-representatives.pdf

Welsh Government Workforce Partnership Council agreement on using AI at work: https://www.gov.wales/using-artificial-intelligence-work

7

APPENDIX A
SPECIFIC USES AND APPLICATIONS

This section identifies important common and emerging uses and applications of AI in retail. A summary of key opportunities and challenges is listed for each.

7.1 SUPPLY CHAIN AND LOGISTICS

7.1.1 E-COMMERCE, OMNICHANNEL AND LAST-MILE DELIVERY

AI-enabled advancements in marketing, warehousing and logistics have recently fuelled the ongoing expansion of e-commerce, omnichannel offerings, quick-commerce and the outsourcing of last-mile delivery. In Europe, e-commerce turnover is expected to be more than €958 billion, with 72% of Europeans estimated to have bought goods and services online in 2024.[131] These trends have implications for retail markets and work in the sector. Many brick-and-mortar retailers now provide online, omnichannel or click-and-collect services, many of which involve the outsourcing of logistical support and delivery to e-commerce and online delivery platforms.[132] It has also driven the emergence of quick-commerce grocery delivery platforms. All of these services have transformed work in the sector as increasing numbers of retail workers are involved in the fulfilment of online orders, including the use of AI and algorithmic management to streamline and direct the picking and delivery of merchandise. Last-mile delivery services also often outsource delivery to platform delivery services to food delivery platforms who often employ delivery workers on a self-employed basis.

OPPORTUNITIES

- Omnichannel and some quick-commerce applications can provide some bricks-and-mortar stores a lifeline for competing with online retailers, preserving jobs.
- Pursuing a strategy of competing against e-commerce by focusing on added value and customer experience, rather than competing on price, may lead to more customer-oriented and higher value-added roles (upskilling) at some retailers.

RISKS

- The retail sector has traditionally been a source of part-time jobs (often held by students or women with caring responsibilities), which face replacement by male-dominated logistics gig work due to shift to omnichannel and e-commerce.
- Real time pricing data from low-overhead retailers fuels competition and requires staff to respond to competitor price information.
- Poor working conditions in warehousing and delivery roles in large e-commerce and quick-commerce firms may put downward pressure on employment standards and working conditions in the retail sector more generally.

7.1.2 AUTONOMOUS WAREHOUSING

Fully automated warehouses are expensive to set up and are still quite rare and even market leaders pick a small portion of goods using robots.[133] Though widespread worker displacement is unlikely anytime soon, the use of AI-enhanced digital technologies is increasingly prevalent in warehouse and logistics work. Beyond the use of autonomous robotic picking arms, AI systems are used to track workers and/or goods, direct pickers using wearables, handheld devices or augmented vision technologies for picking. Other uses include exoskeletons which increase human lifting capacities and speeds, automated conveyor belts which direct flows of goods using smart technology, and order management systems.

All these disparate technologies are often coordinated with a Warehouse Management System (WMS) – a technology designed to integrate data from many different sources and increase efficiency by optimising workflows and the movements of goods through the system. These systems maximise efficiency by integrating flows of stock through warehouses with workflows and with supply chain software, and increasingly use AI tools to analyse this data.

Retailers at the forefront of the use of automation in logistics and warehousing have begun to provide such services to other retailers in Europe.[134] Services range from management of front-end website functionality and last-mile route management to contracts to build and operate an automated warehouse.[135]

OPPORTUNITIES

- The hard manual labour of warehouse and logistics employees can be mitigated by the suite of AI technologies which constitute a WMS.
- WMS and wearables can help reduce OSH risks if used to identify and mitigate potential hazards such as heavy lifting, vehicle pathways, and workplace stress.
- Working with AI-enhanced tools and robotics offers the opportunities for workers' skill development.

RISKS

- WMS require extraordinary levels of data input, meaning every aspect of warehouse and logistics employees' is monitored and recorded.
- WMS and AI are often used to increase the pace and intensity of work, rather than to improve workplace conditions. Recent evidence from Amazon warehouses (which has invested heavily in WMS and AI technologies) shows high rates of injuries and OSH incidents.[136]
- WMS and AI are often used to reduce workers' skill, autonomy, and use of initiative, by breaking up workflows into 'tasks' which can be measured and directed.
- Comparing performance using WMS and AI also makes 'slower' workers vulnerable to sanction or even firing.

7.1.3 ORDERING, INVENTORY AND STOCK REPLENISHMENT

Ordering, inventory and stock replenishment systems are capable of digitally monitoring stock and inventory in real-time. These systems not only provide data for sales insights, but can also be used to direct staff to re-stock shelves and automatically order merchandise when stocks are low. Such systems make use of barcodes, RFID tags, image recognition and weighing scales, and increasingly use AI and machine vision to function. These systems are aimed at streamlining ordering and replenishment in line with just-in-time principles, reducing labour and human error in stock checking, and providing greater insight for demand forecasting.

One such system uses shelf-facing cameras, cloud computing and computer vision to help manage in-store inventory in real time.[137] It notifies employees if items are low or out of stock, or of any non-compliance issues, while providing insights for merchandise planning. A similar AI-enabled system, developed by a large fashion retailer in Europe, uses RFID tags and microchips in clothing security tags to enhance inventory visibility and optimise inventory management, transportation and logistics.[138]

OPPORTUNITIES

- Reduces how often staff need to perform time-consuming and routine stock checks.
- Potentially reduces the risk of ordering errors and the responsibility of ordering mistakes for managers.
- Efficiencies could make less profitable operations more viable, saving jobs.

RISKS

- May reduce task variety of store workers, potentially leading to work intensification.
- Could reduce demand for labour in warehouses, although staff numbers in fulfilment centres at some firms using such technology remain sizable[139]

7.2 CUSTOMER MONITORING AND PERSONALISATION

7.2.1 HEATMAPS/CUSTOMER MOVEMENT MONITORING

Online retailers carefully track how customers move around their websites to build up customer profiles and gather data on the popularity of products. Customers in bricks and mortar stores are similarly being monitored by retailers to create detailed maps of their movements and behaviour. This is done for three reasons: to mitigate against theft (Appendix 7.5.2); to better understand customer behaviour and enhance service offerings to match them; and to help feed into inventory and stock replenishment and staff scheduling systems (Appendix 7.1.3).

The technologies used include beacons which read GPS, Bluetooth and other signals emitted from mobile devices,[140] cameras (including those equipped with facial and/or emotional recognition technologies), and audio and kinetic sensors. Gathering extensive data about customer behaviour enables retailers to optimise store layouts, staffing, and product placement. Further, geofencing technology can be used to send push notifications to mobile phones in-store when physically near to a product (if the customer has the retailers' app and enables permissions), or to notify staff that a click-and-collect customer is approaching. Electronic shelf labels – which are being rolled out in stores, including supermarkets such as Casino, Lidl and Asda – introduce the possibility of AI-facilitated dynamic pricing (instant price-matching between competitors, or price surges for popular/ low-stock items).

OPPORTUNITIES

- Heatmap technologies enable retailers and staff to offer more personalised service and better responsiveness to customer demands, potentially enhancing staff relations with customers.
- Workers can upskill by learning to operate these new technologies and interpret their outputs (for example, by optimising store layouts).

- Employees may also learn more about their customers and product range, both in terms of what is popular, and where common confusions arise (e.g., by identifying products which customers commonly seek help with), leading to upskilling.

RISKS

- Heatmapping and related technologies can be used for monitoring not only customers but also to monitor worker performance (See Appendix 7.5.3).[141]
- The EU AI Act (2024) bans employers' use of facial emotion recognition software in the workplace, but it can be used for crime prevention without informing customers.[142] Given it is extremely difficult for regulators to prevent legitimately collected data from being used for multiple purposes, emotion recognition data could be used to evaluate employee performance (e.g., if a customer's mood is elevated or decreased after interacting with an employee).
- Dynamic pricing could undermine consumer trust if they perceive prices to be unfair, leaving staff to deal with disgruntled customers.

7.2.2 PREDICTIVE MARKETING, PERSONALISATION AND PRODUCT VISUALISATION

The predictive marketing practices that have become integral to e-commerce are increasingly becoming possible in bricks-and-mortar stores. The sheer volume of data generated by user interactions online and the honing of ML methods mean that algorithms are increasingly good at predicting interests and purchasing behaviours. The rise of omnichannel offerings and increasing use of smartphones to carry out payments in-store and operate loyalty card and scan-and-go schemes, as well as in-store customer movement monitoring technology (Appendix 7.2.1) mean an increase in the data points available for predictive marketing and personalisation.

Recent research detailed the use of a number of AI-enabled systems in retail stores that use a range of technologies to create personalised experiences for customers and stimulate sales.[143] Uses described include the use of body scanners, smart mirrors and digital in-store signage that can detect customers and provide them with personalised suggestions, the use of RFID tags and location beacons to push notifications to customers about products that may interest them.

Additionally, some stores in higher ticket areas of retail, such as fashion and furniture, have started to use of augmented and virtual reality for product visualisation, to create games and to create immersive experiences to attract customers and encourage sales.[144] These systems can be used to transport customers do different environments, virtually try on clothing and accessories and visualise how furniture might look in their own homes.[145]

These systems collect and use customer data, such as location, product interactions, previous visits and sales history to predict products that may interest consumers.

OPPORTUNITIES

- The insights gleaned from predictive marketing and personalisation can provide sales staff with insights that can be used to provide a highly personalised service and improve sales performance (potentially improving bonuses in high-value retail).
- Improving customer experience and raising sales revenue may help stores remain profitable in a challenging marketplace, potentially protecting jobs.
- A revised focus on customer experience, might lead to a refocusing of jobs towards customer service-oriented roles, leading to upskilling for some.

RISKS

- The introduction of such systems and availability of marketing insights could increase pressure on workers to increase sales. This may lead to work intensification and a lack of recognition for other behaviours that improve the customer experience not measured by a direct sale.
- Increased competition between workers for sales can lead to perverse incentives for teamwork and helping customers more broadly.
- An increased focus on sales performance can also lead to more extensive gathering of employee data and heightened performance monitoring.
- The benefits of these technologies are contingent on them providing accurate or realistic visualisations. Failure for purchased products to live up to visualisations may result in customer dissatisfaction and complaints that staff must deal with.
- May diminish the value of employee advice potentially deskilling worker's job roles.

7.3 WORKER MANAGEMENT AND HR PROCESSES

7.3.1 WORK/STAFF PLANNING AND SCHEDULING

Workforce planning and staff scheduling tools use data from several sources in order to aid scheduling of staff and longer-term workforce planning. Many of these tools are increasingly aimed at, or are being used in, retail organisations of all sizes. One such system uses internal data from in-store cameras and worked hours, as well as data from external sources such as weather forecasts and applies machine vision and ML to predict sales, online orders, in-store traffic and occupancy in order to optimise staffing on an hour-to-hour basis.[146] Other ML-based applications perform automated scheduling and staff forecasting,[147] and AI shift management software, which can be used to optimise shift assignments, resolve scheduling conflicts and enable rapid communication with staff.[148]

When combined with flexible working arrangements, such as zero-hours contracts or self-employment models, such applications enable employers to adjust their staffing levels to predicted periods of high and low demand. This has obvious benefits for employers but potentially exposes workers to extreme flexibility and precarious working practices, shifting the risks from organisations to individual workers.

OPPORTUNITIES

- Could reduce the possibility of management bias in scheduling.
- Better scheduling could be used to ensure stores are not understaffed.
- Efficiencies could sustain less profitable stores and operations potentially saving or creating jobs.

RISKS

- May expose workers to precarious working practices.
- May limit workers' ability to challenge shift allocations due to the appearance of scheduling decisions being 'scientific' and 'out of my hands'.

7.3.2 TASK ALLOCATION, TARGETS AND REWARD

A number of software systems have emerged that automatically assign workers to specific jobs and/or tasks.[149] These include the algorithmic management systems common in the platform economy, such as quick-commerce and logistics, but also in warehousing and in-store. These technologies use AI-based algorithms that draw on data from a variety of sources, including point-of-sale data, customer interactions, RFID tags, wearable devices, in-store cameras, beacons, sensors, kinetic heat-mapping software and browser/app tracking data and use targets and rewards to incentivise certain behaviours or discipline poor performance.

The move to omnichannel has led to in-store retail staff being increasingly expected to pick items from around the store in order to fulfil click-and-collect or online orders for delivery. Staff fulfilling orders are directed to pick items from specified locations using personal devices or mobile phone apps to pick and pack items for collection by customers or delivery drivers. Research has shown how order picking is highly controlled, software and data dependent, distant from the customer and can be prone to error due to out-of-date location data.[150]

Research also shows how these systems use data from a range of sources to monitor task performance of staff. Cashiers are assessed on performance metrics such as scanning speed, total sales and 'interventions'. Sales staff are assessed on number and value of sales. Picking and stocking are assessed on pick rates and labels printed from handheld devices used to scan items.[151] The data is then used to identify the most and least profitable employees and can be used to predict employee fraud. Meanwhile, some aspects of jobs (e.g. affective labour and helping customers) go unmeasured and unrecognised.

OPPORTUNITIES

- Where accompanied by appropriate bonuses, target and reward systems might increase the earnings of high-performing staff

RISKS

- The use of bonus systems and performance-based pay might be associated with less generous base pay (in order to balance out the wage bill) or could lead to sanctions for underperformance.

- Targets and monitoring may lead to work intensification.
- Targets based only on data from measurable actions (e.g. from handheld devices or POS systems) can lead to perverse work incentives by disincentivising behaviours that are harder to measure and quantify.
- Task allocation systems limit agency and encourage robotic performance.
- Data may be used against staff (as evidence of perceived misconduct), and incomplete or errant data could lead to unfair sanctions.[152]

7.3.3 AUTOMATED AND SELF-SERVICE HR PROCESSES FOR STAFF

The use of AI in human resource management (HRM) processes and systems is an area that has been receiving growing attention in recent years.[153] Proponents of AI and Big Data argue that decisions should be 'data-driven', informed by metrics rather than human perception and gut feeling.[154] HR is seen as an area where technologies like robotic process automation and ML can be used to streamline processes and improve outcomes.[155] Uses in the retail sector include systems that use machine learning to aid hiring for store-level positions,[156] and onboarding and systems that enable staff self-service of job information, training and HR services.

In Europe, a large supermarket chain in Belgium introduced a technology that enables employees to access training and other HR services (inc. access to payslips, schedules and organisational communications) from smart devices provided by the firm.[157] These systems can save employees time enabling better and faster communication with employees and quicker roll-out of staff training and organisational policies. Hiring systems that reduce human bias can potentially reduce discriminatory practices. However, such benefits are contingent on appropriate design of the system, tailoring it to the needs of the organisation and the quality and appropriateness of any training data used.

OPPORTUNITIES

- HR communication and self-service applications can provide workers with faster and more convenient access to training, work communications, and information.
- Self-service HR can also mean that staff access to information and/or training is less contingent on gatekeepers, reducing reliance on individual managers.
- Well-designed and appropriately used ML-based hiring systems could be used to better inform hiring decisions, potentially reducing discrimination (although this is rarely demonstrated).

RISKS

- Data collected through workers interactions with self-service HR systems can be used for monitoring and could potentially be used for control and discipline (e.g. for failure to comply with training requirements within a given time).
- Self-service systems may depersonalise HR functions, potentially reducing employee engagement, while increasing bureaucracy.
- Automating HR processes and systems may reduce transparency about how decisions are made and can lead to algorithmic bias that is hard to detect.
- Policies or decisions that are set through self-service or automated systems, may limit the agency of workers and make it harder for workers to challenge decisions that are presented as 'data driven' and scientific.

7.4 STORE AND CUSTOMER SERVICE AUTOMATION

7.4.1 CASHIER-LESS AND STAFF-LESS STORES

Amazon's 'cashier-less' Go (or Fresh) stores have attracted huge media attention since the first opened to the public in Seattle in 2018. They use interconnected facial recognition technology, shelf sensors, and AI software to track which items are purchased. Customers are able to 'just walk out' (after scanning a QR code or otherwise connecting their bank details), with no need to scan barcodes or make a payment. They are later billed and sent a receipt for goods. European firms like Żabka, Tesco and Aldi have since opened stores using similar concepts, and stores using RFID technology or scan-and-go applications have popped up in major cities across Europe.[158]

These stores offer consumers extreme convenience but are much more difficult and expensive to operate than normal stores. They also rely on the use of a range of cameras, sensors and technologies that generate data on a massive scale and often link to customer loyalty schemes or payment data. This data can be used to create customer profiles for use in personalisation and predictive marketing (Section 7.2.2), and can be used to

feed into customer movement monitoring (Section 7.2.1), inventory management systems (Section 7.1.3) and workforce planning and scheduling systems (Section 7.3.1), all of which can have implications for staff. Staff-less stores and cashier-less (or even just self-checkout) systems, also increasingly rely on the kind of anti-theft and security systems described in section 7.5.2. As such, any staff that remain in store increasingly take on security responsibilities. While staff-less stores are high profile and self-checkouts are ubiquitous in supermarkets and proliferating in other areas of retail, there is evidence that some retailers are rowing back on such systems due to higher-than-expected operating costs, increased inventory 'shrink' (loss due to theft or errors) and/or negative customer sentiment.[159]

OPPORTUNITIES

- Such stores are rarely staff-less, and in-store assistants may benefit from time being freed up from rote checkout work to be able to better support customers.
- Remote monitoring and technology jobs are also likely to be increased by cashier-less stores.

RISKS

- May lead to some level of job displacement.
- Cashier-less stores do not eliminate human labour entirely, they automate the simplest tasks and leave workers to solve the most difficult ones (items without barcodes, shoplifting, technology problems and errors).
- Like self-checkout technology, cashier-less stores may create an adversarial relationship between shoppers and workers by forcing employees to monitor and police customers. Employees must work harder to maintain positive relations with customers while managing potential conflicts.[160]
- Cashier-less technologies enable outsourcing and offshoring. Amazon's cashier-less store in fact relied on 1,000 contractors to monitor, label, and check live feeds and data from the stores. But many of these workers were based in India and paid significantly lower wages than workers in Europe.[161]
- Cashier-less technology is not perfect and customers may be overcharged for goods, which might lead to staff having to deal with angry customers.

7.4.2 CUSTOMER SERVICE CHATBOTS

Customer service chatbots have become almost ubiquitous in the e-commerce and omnichannel offerings of larger retailers. These systems range from simple algorithmic 'decision-tree' systems, that attempt to correctly answer customer queries using pre-coded responses or direct them to a human customer support operative if necessary, to more sophisticated systems that use ML and natural language processing to predict solutions to customers' problems and provide a more human-feeling experience.[162] Chatbots can be used to answer customer queries, make recommendations, support sales and/or deal with problems and complaints, and can create a sense of social presence.[163]

These systems can reduce the volume of queries that retail or customer service staff have to deal with, potentially reducing aggregate demand for customer service operatives in large retailers. However, they can also lead to staff having to deal with frustrated customers, many of whom still prefer to engage with a human and who have to navigate these systems in order to gain access to a human operative.[164]

OPPORTUNITIES

- Where these systems work well, they can reduce the number of customer queries that staff need to respond to.
- Can improve consumer sentiment in some sectors of retail, compared to human chat agents online.[165]

RISKS

- May lead to job displacement in customer service roles in larger retailers.
- May lead to staff having to deal with a greater proportion of frustrated customers with more complex complaints or problems.
- Internal chatbot systems may contribute to a greater separation between frontline staff and central customer service departments

7.5 SECURITY AND LOSS PREVENTION

7.5.1 COUNTERFEIT DETECTION

The use of AI tools to protect against counterfeit goods is a growing area of interest for retailers. This is especially important for online retailers and those with 'marketplaces' where third parties sell goods (e.g. Amazon and eBay). Several AI-powered technologies have been developed to reduce these risks. Some use blockchain verification (digital records) to trace products through the supply chain to ensure their authenticity. AI technologies can be used to cross-check blockchain records for suspicious anomalies in supplier or logistics data. These can also be made customer-facing, so customers can scan QR codes and confirm product authenticity.

Amazons' AI-enabled 'Transparency' program – offered as a paid service to third party sellers on its marketplace – proactively engages with suppliers to ensure product authenticity. It uses barcode scanning to validate authenticity across the supply chain, and finished goods sold on its platform are marked with a 'Transparency' logo. Transparency connects with Amazon's 'Project Zero', a ML tool which automatically scans products on its marketplace, flagging suspicious items for scrutiny or removal.[166]

Third-party software vendors, provide similar tools which use image recognition, object detection and pattern analysis to visually analyse products and compare them with verified images sourced directly from manufacturers.[167] The system is used to spot fakes in the returns system in pharmaceuticals, luxury goods, fashion and electronics.

OPPORTUNITIES

- There is some opportunity for worker upskilling through engagement with counterfeit detection tools.
- More broadly, successful counterfeit detection minimises the emergence of a shadow retail sector and upholds formal employment in the industry.

RISKS

- Use of counterfeit tools may increase workload, particularly for those working in smaller retail outfits without dedicated counterfeit and supply chain teams.
- Supply chain and logistics staff must more frequently scan and verify products, adding to workload.

7.5.2 ANTI-THEFT DETECTION AND SECURITY

Theft, organised retail crime and violence and abuse towards retail workers has been on the rise.[168] Traditional anti-theft measures have typically included anti-theft tags, and physical impediments such as cabinets to protect high-value merchandise, public view monitors to let customers know they are being watched, and human security staff who patrol stores. However, AI-based systems have been developed that analyse data from cameras, RFID tags, beacons that detect mobile phones and weight sensors, with machine vision and ML in order to detect suspicious behaviours that might predict theft or fraud (e.g. substituting a high-value item for a low value one).

Some systems are aimed at flagging customers identified as a theft or security risk, or flagging suspicious behaviour. For example, one system uses facial recognition and AI to identify customers who have been previously flagged for retail theft on entry to the store using security camera data.[169] Other systems incorporate customer monitoring and heatmapping systems (Appendix 7.2.1) – using video, RFID and Wi-Fi beacons to track customer movements throughout stores – in order to identify 'suspicious' customer behaviour.[170] Similarly, AI-based systems at self-checkouts and POS points use weight sensors, RFID tags and increasingly cameras, to monitor whether items placed in bagging areas match those detected.[171] Others use RFID technology in checkout bins to streamline the self-checkout process further, reducing the need for staff intervention,[172] although the cost of RFID-based systems may be prohibitive for lower-margin retail. Such systems alert staff to intervene when they detect suspicious or anomalous activity and potentially increase the frequency of staff involvement in-store or at self-checkouts. One system triggers a brake in shopping carts if it detects that RFID tags in a trolley of goods do not match data from POS transactions.[173] The system aims to prevent the merchandise from leaving the premises, without staff having to intervene.

However, not all anti-theft and security applications are directed solely at customers. Two US vendors, that also operate in the UK and Europe, offer services that use AI and data analytics to monitor administrative data in order to model employee behaviour and flag activities that could be fraudulent (e.g. in the ordering, processing, shipping or returns process).[174] Thus, it is not only customers that can be the object of suspicion (as discussed in the following section).

OPPORTUNITIES

- Systems that prevent checkout and/or prevent unpaid for items leaving the store, may prevent theft occurring before it happens, therefore negating the need for workers to confront customers.
- Security measures that are visible to potential thieves my act as a deterrence.

RISKS

- Securitisation of stores puts additional pressures on retail staff, particularly security guards and shop-floor workers.
- Staff are less able to use their judgement to decide whether it is safe to intervene in cases of theft or fraud.
- Data from monitoring and surveillance of staff could be used as evidence against them in disciplinary hearings, and may lack mitigating contextual information.

7.5.3 STAFF SURVEILLANCE AND MONITORING SYSTEMS

Many of the systems mentioned above necessarily involve the collection and processing of substantial amounts customer and worker data. This can range from POS data on customer purchases and preferences used in personalisation systems, to data from cameras and RFID tags used in stock replenishment and anti-theft systems, to data on worker movements and transactions from POS transactions and wearable devices used in task allocation and reward systems. The collection of data from these sources provides employers with opportunities for the monitoring and surveillance of staff on an unprecedented scale. Data collected on customers ostensibly for one purpose can also be repurposed affecting workers in various ways. For example, data on customer traffic and in-store interactions may be collected by in-store cameras, Wi-Fi hotspots or audio beacons for personalisation, merchandising or security purposes. However, this data can also be used for dynamic scheduling practices that reduce shift predictability alongside more sophisticated performance monitoring, increasing the employer's capacity to monitor staff productivity.[175]

Appendix 7.3.2 already notes how target and reward systems enable retailers to use data from their POS system to monitor staff performance to identify underperforming staff. Similarly, handheld devices used to direct item picking for online deliveries or for self-service HR can also be used to monitor and log staff locations and activities (sections 7.3.2 and 7.3.3. Moreover, as noted in section 7.5.2, some loss prevention systems monitor staff in order to identify anomalous transactions and predict employee fraud and theft.[176] Drawing on testimony from retail workers, research from the UK's Institute for the Future of Work (IFOW) shows how data from in-store heatmapping and the stores POS system can be combined to monitor cashier scanning speeds, which can then be used to bring staff in for performance review. They note how other systems even use data from wearable headsets to monitor eye movements and whether employees are talking to their colleagues.[177]

The detailed customer data used for personalisation (see section 7.2.2) and enterprise planning (section 7.1.3) can also be used to indirectly monitor and evaluate staff, subjecting them to dynamic work schedules. This digitisation of customer insights may also devalue staff-customer relationships, deskilling workers.[178]

OPPORTUNITIES

- Monitoring that is accompanied by the introduction of a performance reward scheme could provide the opportunity to boost pay, particularly in low-pay positions.
- Surveillance data could support workers in cases of unfair complaints (although the reverse is also true).
- Employee-generated data offers potential value, enabling unions to negotiate terms when implementing workplace surveillance systems' (particularly where there are strong data rights).

RISKS

- Increased worker control over the assignment of and performance of tasks can lead to work intensification with negative effects on wellbeing and job quality.
- Increased surveillance can undermine worker trust and engagement.
- Automated monitoring systems can lead to a lack of human oversight and make it harder for workers to contest decisions, rewards or sanctions made by the system.
- The lack of transparency about how decisions are made can undermine trust.
- There is a risk that data can be used as evidence against workers in disciplinary cases (possibly without important contextual information).

8

APPENDIX B
SUMMARY TABLE OF USES, RISKS AND OPPORTUNITIES OF AI IN THE RETAIL

Use	Examples	Opportunities	Risks
SUPPLY CHAIN AND LOGISTICS			
e-Commerce, omnichannel and last-mile delivery	AI-directed fulfilment of orders for click-and-collect. Last-mile delivery services directed by AI.	• Click-and-collect services may preserve jobs in bricks-and-mortar stores. • Retailers may pursue strategies based on customer service to compete with e-commerce.	• Jobs reconfigured away from predictable in-store jobs to delivery roles on self-employed contracts. • In-store staff have to deal with customers with up-to-minute price information. • Poor working conditions in online fulfilment centres may put downward pressure on sector working conditions.
Autonomous warehousing	Fully/partially automated warehouses. Use of AI-based WMS to optimise workflows in existing warehouses.	• WMS may mitigate hard manual labour and identify/reduce potential hazards. • Introduction of robotics and automation may lead to upskilling for some workers.	• Increased data collection and monitoring of warehouse staff. • WMS use may lead to work intensification. • Reduction of autonomy and worker discretion in task performance. • Workers who find it harder to keep up may be at risk of sanctions or dismissal.
Ordering inventory and stock replenishment	Monitoring of stock and inventory in real time. Automated/predictive ordering and replenishment.	• Reduces need for staff to perform stock checks and ordering. • Reduces staff culpability for ordering errors. • May support store competitiveness, preserving jobs.	• Reduces staff variety, leading to work intensification. • May reduce demand for labour in warehouses and storage.
CUSTOMER MONITORING AND PERSONALISATION			
Heatmapping/customer movement monitoring	Monitoring of customer movements in store for store layout optimisation, staff alerts and dynamic pricing.	• Can be used to inform staff and enhance customer service. • Can lead to upskilling for staff tasked with optimising store layout. • Can feed into staff development on customers and product ranges.	• Staff performance may be indirectly monitored using customer monitoring systems. • Facial recognition systems could be used to monitor facial expressions to evaluate customer interactions. • Dynamic pricing may leave staff to deal with disgruntled customers.
Predictive marketing, personalisation and product visualisation	Use of customer monitoring and smart mirrors to provide predictive marketing. VR and AR systems to aid product visualisation.	• Can be used to inform staff and enhance customer service. • Improved customer experience can aid store competitiveness, preserving jobs. • A focus on customer experience may lead to more customer service-oriented roles.	• May increase pressure on staff to increase sales. • Increased sales competition between staff may undermine teamwork/cooperation. • Increased focus on sales performance could lead to greater performance monitoring.

Use	Examples	Opportunities	Risks
WORKER MANAGEMENT AND HR PROCESSES			
Work/staff planning and scheduling	AI tools that use internal and external data to dynamically predict short-term scheduling and longer-term staff needs.	• Could reduce manager misuse of scheduling as a disciplinary tool. • Could be used to ensure stores are not understaffed. • Efficiencies could sustain less profitable stores, preserving jobs.	• May expose workers to last-minute scheduling and precarious work practices. • May make it harder for workers to change or challenge shift allocations.
Task allocation, targets and reward	AI tools that automatically assign workers to specific jobs or tasks or dynamically set targets.	• Bonuses related to performance may increase earnings of high-performing staff.	• Performance related pay might lead to less generous base pay and/or sanctions for underperformance. • Targets and monitoring may lead to work intensification. • May disincentivise behaviours that are harder to measure and quantify. • Task allocation systems limit worker agency and discretion. • Data may be used against staff as evidence of misconduct and incomplete/errant data could lead to unfair sanctions.
Automated and self-service HR processes for staff	Automated hiring and onboarding systems. Self-service HR systems that enable access to company policies and AI-tailored training.	• Can enable staff with more convenient access to training and information. • May mean access to training is less contingent on gatekeepers. • Well-designed hiring systems can be used to better inform hiring decisions.	• Data collected through self-service HR systems can be used as evidence of non-compliance with communications and training. • May depersonalise HR functions and reduce employee engagement. • May reduce transparency about how decisions are made. • Automated decision-making tools may be harder for employees to challenge.
STORE AND CUSTOMER SERVICE AUTOMATION			
Cashier-less and staff-less stores	Systems that use item tracking technologies and AI to automatically calculate customer baskets.	• Reduces the need for staff to perform rote checkout work. • May lead to upskilling for staff required to monitor these systems.	• May lead to job displacement. • Leaves workers with a greater balance of complex tasks: work intensification. • May pit workers against customers whom they must increasingly monitor. • Effectively offshores checkout tasks to workers in lower-wage countries who monitor these systems. • Where cashier-less technology goes wrong, staff are left to deal with angry customers.
Customer service chatbots	Online chatbots that use AI and NLP to answer customer queries, make recommendations, support sales or field problems/complaints.	• Reduces number of queries staff deal with. • Can improve customer satisfaction compared to online chat with a human agent.	• May lead to job displacement. • Leaves more complex problems for staff. • Internal chatbot systems may lead to greater separation between frontline and central office staff.

Use	Examples	Opportunities	Risks
SECURITY AND LOSS PREVENTION			
Counterfeit detection	AI systems that use block-chain or machine vision to identify counterfeit goods in the supply chain. Systems used to identify fraudulent/ counterfeit returns.	• Opportunity for upskilling for workers tasked with using these systems. • Successful counterfeit detection counters the growth of a shadow retail sector, upholding formal employment.	• May increase workload for staff, particularly in small retail-ers. • Adds to tasks workers in retail supply chain and logistics roles, adding to workload.
Anti-theft detection and security	Use of AI at checkouts and entrances/exits to detect or predict theft. AI systems that identify customers who are flagged as suspicious.	• Some systems can prevent theft before it occurs, negating the need for staff to confront customers. • Systems that are visible to customers may act as a deterrent.	• Security and shopfloor workers may be under greater pres-sure to confront customers flagged by such systems. • Staff may be less able to exercise their own judgement about when it is safe to intervene. • Data from customer monitoring systems could be used against staff and may lack mitigating information.
Staff surveillance and monitoring	Data from customer moni-toring and task allocation/ reward systems can be used to monitor staff perfor-mance. Dedicated staff monitoring systems used to predict staff fraud.	• Data from staff surveillance systems can be used to support staff in cases of unfair complaints from managers or customers. • May present an opportunity for workers to leverage the data they produce to negotiate in relation to in-troduction of such systems.	• Increased monitoring may lead to work intensification. • Increased surveillance may undermine worker trust and en-gagement. • Automated monitoring systems, without human oversight, can make it harder for workers to contest decisions. • Lack of transparency about how decisions are made may un-dermine worker trust. • Data from staff monitoring may be used against workers in disciplinary cases.

9

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