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Sociotechnical Change in British Supermarkets: Examining the Role of Labour

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ABSTRACT

When predicting the future of retail work, commentators tend to focus on automation and labour replacement and neglect the continued role played by labour, particularly in food retail. To understand this role, this article draws on both interview and newspaper data to show how change unfolded in the sector from before to just after the Coronavirus pandemic. Specifically, it shows how increased technology adoption and use in food retail occurred alongside an increased reliance on labour. The availability of a flexible labour pool that was easy to scale and later disband enabled employers to respond to increased consumer demand rapidly. In contrast to futurist predictions of the proliferation of labour-replacing technologies, the analysis shows how food retailers continued to prioritise short-term solutions contingent on human labour rather than investments in longer-term automation programmes, reflecting historical patterns of sociotechnical change within the sector.

1 | Introduction

Retail work has attracted the attention of those predicting significant labour replacement due to technological change (Begley et al. 2019; Davey 2022; Drenik 2023). Frey and Osborne (2017) estimated that 97% of retail cashier roles are highly vulnerable to computerisation, prompting the claim that “*retail is one industry in which employment is likely to vanish*” (Oxford Martin School 2017, p. 3). Similar assertions are echoed elsewhere, predicting a dramatic reduction in the quantity of work due to the anticipated uptake of robotics, drones and vision-enabled self-service systems (Brynjolfsson and McAfee 2014; Ford 2015). However, these deterministic assumptions have been challenged by social shaping of technology (SST) scholars who argue that the social, political and economic context in which technologies are embedded is likely to shape a future of work that is much more varied and messier than suggested (Wajcman 2017). Despite this, there is limited empirical work on the evolution of sociotechnical systems in traditional workplaces (Lloyd and Payne 2021; Howcroft and Taylor 2023; Joyce et al. 2023), particularly in the retail sector (Carré et al. 2020 is a

notable exception). This is surprising given the sectors prominence in wider public discourse and the large number of workers who remain employed in the sector.

Retail work has long been characterised by low pay and insecurity, offering limited opportunities for upskilling and progression (Burt et al. 2010; Price 2011; Carré and Tilly 2017). Some suggest that these conditions have slowed the diffusion of retail technology (Carré et al. 2020) as short-term gains have been prioritised over longer-term investments in labour-saving technology (Basker 2012). In low-margin short-termist sectors, like retail, the higher-cost option of long-term investments in technology may be passed over when a cheaper alternative is available (Moody 2018). Recently, this has been evident in the technological choices of retailers who have opted for systems with ‘documented fast payback’ (e.g. self-checkouts) over the ‘daunting upfront costs’ of more sophisticated infrastructure (Carré et al. 2020, p. 27).

Thus, before the pandemic, food retailers appeared relatively slow to expand into online markets – largely because of the

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small margins offered by selling goods online, in addition to customer preferences for seeing produce before purchasing and the short lead times associated with physical retailing (Magalhães 2021). However, during the pandemic, physical restrictions prompted food retailers in particular to expand their provision of noncontact forms of shopping, both online and in stores (Benner et al. 2020; Carré et al. 2020). This led to renewed interest in the sector by the media, with some outlets reporting an “irreversible” shift towards online shopping claimed by industry insiders (Smithers 2020; Meadows 2020; BRC 2021) and echoed by influential management consultants (Fiedler et al. 2020; McKinsey 2020; Deloitte 2020).

Such claims received limited attention within academic research but do raise the question of how we view technological change in a time of disruption. This discourse often fails to mention the unpredictability that characterises the outcomes of technologies and exogenous crises (Howcroft and Taylor 2023). In recognition of this shortcoming, this paper takes the period spanning the Coronavirus pandemic as an important context upon which to interrogate notions of sociotechnical change and the messiness that characterises it. It applies an SST lens, central to which is the rejection of linear models of innovation that omit the continuously evolving context in which technologies are embedded and shape how they are used and experienced by workers (Williams and Edge 1996; MacKenzie and Wajcman 1985). Keeping this in mind when analysing the shock of the pandemic, we demonstrate how unforeseen events can derail food firms’ priorities with consequences for technology and how labour is organised.

This paper investigates the question: how has sociotechnical change evolved in food retailing in recent years? Although the research commenced before the pandemic, the resultant crisis shifted the focus towards one of sociotechnical change over a period of immense, but not necessarily permanent, disruption. As mentioned, the pandemic and resulting lockdowns promoted deterministic narratives. As a corrective, we provide an intervention to the debate which challenges the sentiment popularised in the mainstream discourse that the pandemic would bring about permanent radical shifts in work organisation due to accelerated technological change, drawing on the case of food retailing. Our findings suggest that food retailers opted for temporary solutions, such as expanding their online provision, to mitigate financial risk in an uncertain climate. However, several of these fixes were reversed once the peak of the pandemic was over and a cost-of-living crisis ensued. This article therefore makes an important contribution by interrogating the relationship between instances of disruption and technological change, through an SST lens. We show how reliance on low-wage labour persisted in food retailing despite oscillating technological change during a period of crisis, prompting a rethink of how work and technology scholars may view future shocks in a world increasingly characterised by ‘permacrisis’ (Brown et al. 2023).

The research is presented as a timeline, illustrating how the pandemic unfolded, both at the organisational and the sectoral level, and influenced how food retailers approached the implementation and use of technology. The next section reviews the evolution of shop-floor conditions using historical

accounts of retailing and technology adoption from extant literature. Following this historical review, the methodology section expands on the analytical process in more detail. We then draw on an original longitudinal data set comprised of interview and newspaper data, presenting three stages of data collection across two supermarket case studies. This approach aligns with SST scholarship which values historically embedded case studies demonstrating the contingency of technological innovation (Bijker 1997).

2 | Historical Processes of Sociotechnical Change in Food Retail

According to SST scholars, drawing on the historical context of a sector is critical to understanding its contemporary manifestation:

*...the history of technology is a path-dependent history,
one in which past events exercise continuing influences.*
(MacKenzie and Wajcman 1999, p. 19)

In the following discussion we outline a brief history of socio-technical change in food retailing, enabling us to better conceptualise contemporary retailing as an extension of this history.

During the 1950s, a self-service model of food retailing was introduced in the UK which required customers to use shopping trolleys to collect pre-packaged goods from supermarket shelves. This represented a new technology of the time (Bowlby 2000), which led to the re-organisation of retail work, expanding the role of the customer in the labour process (Gregory 1991). Existing ‘personal service functions’ (such as the greengrocer, butcher and baker) were no longer required as food items were retrieved by customers themselves (Wrigley and Lowe 2002). This represented a sociotechnical shift away from traditional retailing practices, which was viewed suspiciously by trade unions who were concerned that jobs would be deskilled and become more easily accessible to women workers (du Gay 2004). This position reflected the role unions played in the systematic exclusion of women from ‘men’s work’ to protect male jobs and prevent pay and conditions from deteriorating (Wajcman 1991). However, trade union concerns became manifest by the 1970s when the majority of workers in supermarkets were women (Gregory 1991). During this time, retail fell from one of the highest-paying sectors at the start of the century (Winstanley 1983) to one of the lowest (Robinson and Wallace 1974), but men remained in the more highly paid managerial positions (Palm 2017) as the number of women in low-paid cashier roles grew (MacEwen-Scott 1994).

Although the diffusion of retail technology has been slow (Carré et al. 2020), predictions of labour replacement have been common for several decades. In the 1970s, retailers believed that innovations such as electronic points of sale (EPOS), universal product codes (UPC) and barcode scanning systems would create task efficiencies which would reduce the volume of work (Basker 2016; Hopping 2000) (e.g. via the removal of staff scheduling, stock ordering/management) (McLaughlin 1999;

Freathy and Sparks 2000). However, in spite of these innovations, by the 2000s, retail work was viewed as the “*new generic form of mass employment*” (Grugulis and Bozkurt 2011, p. 2) as the number of people working in the sector grew. EPOS systems and bar codes made buying patterns much easier to monitor, further fuelling the consumer cycle as retailers could market products to customers more effectively using the data these technologies generated. As a result, this led to increased sales and, consequently, an increase in demand for labour (Newsome et al. 2013).

This has changed somewhat in recent years. In retail stores where food predominates,¹ the number of people employed has fallen, as has the average number of hours worked weekly by retail sales assistants and cashiers (from 24.4 h in 2006 to 22.8 h in 2023) (ONS 2023). This has occurred parallel to the proliferation of technologies such as self-service checkouts that were viewed as a relatively low-cost labour-saving alternative to human-operated checkout belts (Basker 2016). However, it would be inaccurate to assume that this reduction in staffing levels and working hours has occurred directly because of the implementation of new technologies. As Howcroft and Taylor (2023, p. 9) state “...the relationship between computers and humans is not determined by technological capabilities but by the priorities and strategies of organisations that own and operate them.”

Since the 1990s, retailers have taken advantage of opportunities to reduce operating costs and store staff headcounts (Beynon et al. 2002). The strategies adopted have included the flattening of store hierarchies, the centralisation of decision-making and the implementation of lean management (e.g. ‘just-in-time’ stock control), inter alia (Ogbonna and Wilkinson 1998; Freathy and Sparks 2000; Hopping 2000; Grimshaw et al. 2002; Price 2011; Basker 2016). Centralised decision-making occurred alongside perpetual layering across the sector, whereby middle managers, previously responsible for decision-making at the store and regional levels, were made redundant (Grimshaw et al. 2002). However, the focus on cost-cutting has largely occurred at lower levels. As a consequence, low pay, the use of hyper-flexible shifts and the intensification of the working day have all contributed to a reduction in the quality of retailing work (Perrons 2000; Grugulis and Bozkurt 2011; Bozkurt 2015; Hadjisolomou et al. 2017).

This synopsis of sociotechnical change over time shows that technological transformations cannot be disentangled from management strategies to sustain profit margins. Since the entry of women into the sector, retailers have retained a low-cost and flexible approach to labour and technology deployment—whereby access to cheap labour has predominated as a service strategy over investment in high capital technology projects. Despite this established history, some have suggested that the pandemic represented a turning point in the trajectory of retailing during which time we would observe an irreversible shift in the organisation of labour and technology (Nott 2020; Fiedler et al. 2020; McKinsey 2020; Deloitte 2020). However, the disruption caused by the pandemic challenged the traditional focus of retailers away from the profit imperative due to competing epidemiological demands causing them to reconfigure work and technology usage. We investigate this in our empirical work, but first we

outline the methodology adopted to examine sociotechnical change in food retailing throughout this period.

3 | Research Methodology

To examine how sociotechnical change has evolved in food retailing, a qualitative methodology was adopted. Data was collected between September 2019 and March 2023, which captured a pivotal point in the timeline of UK food retailing. Two types of data collection occurred. One included 36 interviews, primarily with workers and managers across two food retailers, the other involved an extensive newspaper analysis.

Initially, two organisational case studies were selected to capture how workers and management in food retail experienced sociotechnical change before and during the pandemic. Retailer A specialises in the sale of food items through local convenience stores (with 2–5 workers per shift), often located at the centre of communities. Retailer B primarily sells goods from bigger stores (with 30 to 50 workers per shift) situated outside of town centres and offers a broader range of products, including ‘artisanal’ food that is prepared (in part) on-site. Interviews were carried out between October 2019 and February 2021. The focus of the study from the start was on sociotechnical change in food retailing and the fieldwork commenced without the foresight of the pandemic’s disruptive impact. Nevertheless, the collection of data before the pandemic provided an opportunity to explore how the shocks that followed shaped technology adoption. The first set of interviews focused on issues related to the changing use of technology in the sector and the impact on the labour process. The onset of the pandemic led to a series of further interviews which invited participants to reflect on the experience of work for those on the ‘frontline’, as well as changes in policy and workplace practice—primarily focused on how technology was used throughout this period (see Table 1 for details of the case studies and interviews). Theoretically informed by SST, the interviews, as detailed in Table 1, sought to understand the role of human and social factors influencing technological change, how technology reinforced existing power dynamics in the workplace, the extent to which technology implementation evolved based on organisational priorities, pressures on management and customer attitudes, and how workers responded to the above. These themes speak to key aspects of SST, namely that technology is shaped by institutional and human choices, and that technology is thus not neutral but socially negotiated (MacKenzie and Wajcman 1985; Williams and Edge 1996). Before the pandemic, interviews were largely conducted face-to-face in store offices or neutral spaces such as cafes and were accompanied by a site tour, but once lockdown restrictions ensued, interviews were carried out remotely. The interviews lasted between 45 and 90 min and followed a semi-structured format.

The second element of the research involved constructing an original dataset of over 400 newspaper articles (March 2020 to March 2023) in order to gather insights into how sociotechnical change in food retail was presented during the pandemic in the mainstream media. Newspaper analysis is a vital tool for qualitative researchers seeking to investigate periods of disruption because media narratives actively shape public opinion (Altheide

TABLE 1 | Interview Participants and Thematic Areas Covered.

Retailer A	Interview themes	Pre-2020	Post-2020
HR Manager	HR policies (inc. working time, contractual arrangements), skills,	(F)	
HR Manager	use of technology, performance management, training, industrial	(F)	
Senior HR Manager	relations, changes in sector over time, perceptions of future challenges	(F)	
Operations Manager	Operational significance of convenience shopping, technology	(F)	
Operations Manager	projects (inc. trial and rollout), prevalence of online, approach to	(F)	
Senior Operations Manager	sector cost competition, changes during the pandemic	(F)	(V)
Area Manager	Recruitment and skills, workforce composition, daily running of stores, labour costs, use of technology and training availability, progression, online availability, perception of future challenges	(F)	
Trade Union Officer*	Working conditions and key challenges, industrial relations	(F)	(V)
Trade Union Officer*	arrangements, issues/opportunities related to technology, wider	(V)	(V)
National Official*	sectoral trends, changes in the context of the pandemic		(V)
Regional Official*		(F)	
Retailer B			
Regional HR Manager	Same as HR manager above, in addition to changes in	(F)	(V)
Store HR Manager (Union Rep)	arrangements during the pandemic (e.g. contracts, hiring, use of technology)	(F)	(V)
General Store Manager	Recruitment and skills, workforce composition, running of stores, labour costs, use of technology, training, progression, servicing of	(F)	(V)
Senior Store Manager	online, perception of future challenges, pandemic-related changes to the above	(F)	(V)
Supervisor	Daily running of stores, use of technology across sites and training	(F)	
Supervisor (Management Trainee)	availability, progression, working time arrangements, perception of future challenges	(F)	
Customer Assistant	Characteristics of the job (inc. contracts, daily tasks, autonomy, training), experience of technology, intensity and skill demands,	(F)	
Customer Assistant	impact of the pandemic in terms of personal experience at work	(F)	
Customer Assistant	(inc. epidemiological threat, new tasks, availability of support)		(V)
Customer Assistant			(V)
Customer Assistant			(V)
Customer Assistant			(V)
Trade Union Officer*	Same as Trade Union Officer above	(F)	(V)
Additional interviews			
Trade Body Representative	Changing nature of work in the sector, opportunities for training and progression, use of technology and impact on skills, diversity initiatives, perceptions of future challenges	(V)	
National Trade Union Officer	Working conditions and key challenges, industrial relations arrangements, challenges/opportunities related to the introduction of technology	(V)	
Equalities Officer	Same as above, plus changes in the context of the pandemic and		(V)
Equalities Officer	how these were experienced by different demographic groups, and strategies to mitigate these effects		(V)
*with Retailer A or B oversight	Key: (F) face-to-face (V) online video call		

and Schneider 2013). Given the wide range of media coverage devoted to food retailing throughout the pandemic, news outlets (including traditional and social media) played a role in influencing the behaviour of food retail customers (Music and

Charlebois 2022). To ensure a comprehensive analysis of this critical timepoint, data was collected from nine major British newspapers with various political leanings, as well as an industry publication. Relevant articles were identified using the Factiva

database that allows for the thematic search of articles related to 'General Labour Issues', 'Labour/Personnel' 'Digitalisation' or 'Information Technology'. To capture overarching trends among the largest employers, the top ten UK supermarkets by market share were also included in the search.²

All of the interview data was transcribed verbatim by the lead author. This presented a valuable opportunity to reflect on the data before it was analysed in NVivo (Davidson 2009). Initial broad concepts, themes and major events were noted as part of the transcription process before a more systematic round of reflexive thematic coding was undertaken (Braun and Clarke 2019). Alongside interview and newspaper data, fieldnotes and initial reflections captured immediately after the interviews also informed the coding process. The data was then coded chronologically in order of collection, including the newspaper data, which enabled the mapping of the evolution of sociotechnical change in food retail over time. First-order codes were generated and informed largely by the transcription process and discussions within the research team. These highlighted important components within the context of the study (e.g. re-organisation of work, technological developments, sudden changes in market demands) which were subject to further analysis through a second round of coding. The second-order codes enabled the research team to make sense of the daily intricacies of working in food retail over this period and how they related to the evolving sociotechnical context (e.g. specific changes to terms and conditions, individual experiences of pandemic restrictions, instances of work intensification). The following section discusses the key findings of the study.

3.1 | Recent Evolution of Sociotechnical Change in Food Retailing

To demonstrate how emergent social conditions influenced the adoption and implementation of technology, this section presents the findings across three time periods. The first explores the trajectory of sociotechnical change in the period just before the pandemic; here, analysis of case study interviews focuses on pressures for work reorganisation intended to maximise efficiency and reduce costs. While technology featured the systems deployed were relatively basic and their use was aimed at achieving cost-cutting. The second timeframe draws on interview and newspaper analysis to reveal how food retailers swiftly altered their approach in response to the demands of the pandemic. This meant expanding their use of existing technologies to widen the provision of contact-free shopping. The final timeframe also draws on newspaper data, to investigate the emergence of a 'new normal' following the lifting of lockdowns and the shift to cost recovery and retrieving market share. Presenting the findings in this manner is intended to provide a counternarrative to the assumptions associated with an acceleration of online shopping and illuminates the complexity of sociotechnical change.

3.2 | Pre-Pandemic: Pressures to Re-Organise Work and Reduce Costs

Before the first lockdown in March 2020, managers signalled that a key priority was enhancing efficiency. Both operations

and store managers were tasked with decreasing costs to enable price reductions while maintaining profit margins. While technology comprised part of the response, the methods and tools adopted were often relatively primitive in terms of their technical sophistication and required minimal capital outlay. Instead of investing in costly technologies that would eliminate the need for human labour, food retailers relied heavily on the re-organisation of work and work processes to reduce the number of staff. The findings in this section outline the impact of these processes of rationalisation, and the resultant work intensification effects.

3.3 | Reducing Hours Through Eliminating Daily Tasks

In both retailers studied, management was keenly focused on reducing labour costs, measured primarily by looking at the number of hours allocated to stores (how many people were working in a store each week and how many hours each worker was assigned). Although the number of hours allocated to stores had fallen significantly in recent years, operations managers in Retailer A had to prioritise their further reduction. A team of thirty staff was tasked with developing an 'efficiency store operating model' in response to "*...the cost of wages going up*" (Operations Manager 2, Retailer A). Wages were negotiated centrally but were also pushed up by national minimum wage increases, meaning that the managers interviewed had little direct influence over these rates. Therefore, the goal was to reduce the number of daily tasks completed by shopfloor staff, thus reducing the hours allocated to stores and associated costs. One operations manager noted that a similar process of rationalisation occurred in the early 2000s when certain roles that "*did not add value*" (Operations Manager 1, Retailer A) were eliminated, such as bag packers and door-greeters. The team investigating efficiencies analysed the minute details of the daily labour process, including ways to reduce the time-intensive repetition of certain tasks (such as counting change in the tills and checking the temperatures in the fridge/freezer units). Management suggested this would "*make workers' lives easier*", while approaching the changes with caution so employees did not feel that they were "*just taking hours away from them*" (Operations Manager 2, Retailer A). Nevertheless, this process of hourly cuts continued until the pandemic, with one of Retailer A stores experiencing a 50 per cent reduction in hours over the previous 4 years.

To support this change programme, Retailer A's operations team procured an all-in-one handset for daily task management (including stock monitoring and work allocation). This illustrates a process that Moody (2018) refers to as 'pen and paper to automation' whereby the digitalised process mirrors the manual process, creating a perception of automation despite tasks often requiring the same level of human input. Decisions about the daily management of the shop floor were made centrally and sent through to stores using these handsets, which meant that store managers were no longer required to do this planning. Headsets were also implemented, which were expected to minimise the amount of time employees spent walking around stores, thereby speeding up the communication process. These new technologies – intended to support rationalisation –

eliminated some tasks (e.g. walking to communicate with colleagues) but also enabled workers to do multiple jobs at once, adding to the intensity of the labour process by requiring multi-tasking for both managers and their staff for the remaining paid working hours, as we explore further.

3.4 | Expansion of Multi-Tasking

Major food retailers adopted multi-tasking to help facilitate functional and working time flexibility over many years (Penn 1995; Beynon et al. 2002; Castillo 2023). As supermarkets became leaner, through the elimination of certain roles and tasks, the scope of the remaining roles increased. Both Retailer A and B offered contracts that contained clauses stating that shop floor employees were expected to carry out “any reasonable requests” made by management, implying that multi-tasking was expected. However, this created tensions among different groups of workers:

...a lot of them that have been here, again, probably 15- to 25-years, they're coming to retirement and they are just happy to just sit there, do the till, do the same job and sometimes they can be very like, “that is not my department” which... I don't like...

(Senior Manager, Retailer B)

The drive towards multi-tasking helped eliminate downtime, which enabled food retailers to reduce the number of hours allocated to each store, thereby reducing labour costs with limited technological intervention. For example, in Retailer B, store managers outlined plans to extend multi-tasking across all shopfloor departments, including the artisanal food counters. In the stores visited during fieldwork, these counters offered customers a range of products that had been prepared on-site (e.g. meats, pizzas, pastries). Originally, the counters were staffed by workers trained specifically in food preparation. However, to reduce costs, the complexity of counter work was simplified, and food was no longer prepared from scratch. Instead, a broader range of shop-floor staff received basic health and safety training, expanding the pool of those qualified to work on the food counters. This shift was not without challenges, as some tasks still required more highly trained personnel. As one explanation put it:

...it's not like someone from the shop can just go onto the counter, but we are going to start looking at that as well... as long as they're health and safety trained, they can still serve, they just can't cut the meat, so we have a lad on produce who will just man and serve, if it needs to be cut then he will call someone down and take the order...

(Store Manager 1, Retailer B)

As other researchers have argued, the problem with multi-tasking is that deskilling and intensification effects can arise as a result (Price 2011; Castillo 2023). In the case of Retailer B, the expectation of multi-tasking extended to workers' mandated breaks thus intensifying their full working day. For multi-tasking to be rolled out at a low cost, food preparation tasks

were deskilled to avoid the costs associated with extra training. In Retailer A, store managers were expected to ‘work remotely’ via tablets, so that they could carry out administrative tasks whilst being physically present on the shop floor. One manager explained how they would no longer be “*chained to the desk... drawing them away from the customers*” (Operations Manager 2, Retailer A), which enabled leaner stores where it was common to have only a couple of workers on the shop floor.

3.5 | Store Restructuring and Delegation of Management Tasks

Restructuring has long been used as a mechanism by retailers to reduce staff numbers through the removal of middle management at store level and processes of centralisation (Grimshaw et al. 2002). In the past, major supermarkets had national, regional and local human resource teams, but many of these layers have since been removed. In 2019, managers in Retailer B were preparing to remove the store human resource manager role to reduce costs. In advance of this, a new system was introduced which generated rotas automatically and enabled employees to book their annual leave online, thus reducing the workload of store human resource managers. Consequently, overseeing the rotas was passed down to individual team supervisors. This was elucidated as follows:

...it's more accountability of payroll onto team managers, so they're given a budget. They have to put corrections in... Holiday requests will normally go to the [HR] manager, but now they'll go to the team manager... they are basically a mini-HR manager then.

(Senior Manager 2, Retailer B)

Supervisors were encouraged to take on the added responsibility of rota management on the basis that it may lead to future promotions. However, this tactic was criticised by an area union official who viewed this as “*dangling the carrot of progression*” (Area Official 1, Union A). In essence, this extra responsibility involved a large amount of ‘chasing’, yet no additional remuneration was offered.

In Retailer A, several operations managers outlined plans to roll out a larger programme of layering to eliminate individual store managers in smaller stores. In urban areas, it was common to find multiple stores located in proximity, which, in the view of the manager quoted, could be overseen by ‘satellite managers’:

...I can't say that we will do that for certain, but I reckon that is where we will end up going... you'd just have store assistant and then maybe your team leaders who then just run the shifts and then a satellite manager to make sure that people are just following the processes.

(Operations Manager 1, Retailer A)

This layering would be made possible by using handsets to transmit daily instructions to individual stores in the absence of the physical presence of a manager. While this restructuring

process replaces some of the repetitive delegation work, it re-allocates other aspects of work that managers are required to do day-to-day.

This highlights how technology comprises one aspect of a multi-faceted strategy adopted by retailers to reduce the quantity of work required each day on the shop floor to increase the amount of value the business could extract at a lower cost.

3.5.1 | During the Pandemic: Strategies to Upscale and Increase Capacity

As the pandemic took hold, food retailers quickly adapted to respond to increased demand. This meant increasing the number of hours allocated to stores and hiring large numbers of new workers, many of whom were recently unemployed or furloughed. This approach was visible across the sector, with media reports stating that over 100,000 workers were hired to fill supermarket vacancies throughout 2020 (Belger 2020). As one manager recounted:

We put an advert out in the local media and we had something like 600 people turn up which was quite hard to manage because we were all meant to be social distancing... we had a queue from the front of the entrance right around the back of the shop and that was like that probably up until 5 o'clock... from about 8 am.
(Senior Manager, Retailer B)

Expanding the technological infrastructure came later, providing support for the expansion of the supermarket workforce. Drawing on interview and newspaper data, the following discussion illustrates how the implementation of new technology throughout this period supported the expansion of work during a time when face-to-face purchasing was restricted.

3.6 | The Rise of Online Shopping

At the start of the pandemic, many retailers expanded their online proposition to meet new demands for noncontact shopping. Grocery retailers with well-established online models were able to scale up quickly by hiring temporary workers to carry out the picking and packing. It was reported that Tesco, for example, tripled its online capacity in 6 weeks (Chambers 2022). However, those that did not have the existing infrastructure in place, such as Retailer B, looked to external partners to provide support for the delivery of their online offering.

Many retailers entered partnerships with third-party platforms, such as Amazon, Deliveroo and UberEats, that provided labour to fulfil delivery demands. This was relatively widespread, with newspaper data showing that 9 out of 10 of the UK's biggest food retailers opted into third-party partnerships between 2020 and 2022. This enabled retailers to expand their online presence while avoiding hiring workers directly. However, in the interviews, several research participants reported on the tensions

that arose between shop floor workers and drivers during busy times, as each struggled with time pressures:

... if you don't complete it in 20-min you can just see a driver glaring at you, you can just see them stood there with their arms crossed.
(Customer Assistant 7, Retailer B)

Although many food retailers continued their partnership with third-party platform providers after the initial lockdowns, demand fell rapidly once the peak of the pandemic was over (Wall 2022). As Williams and Edge (1996) pointed out, technological change does not follow a linear upward trajectory but oscillates as management strategies attempt to respond to wider market demands. Nevertheless, retailers use of platform providers during this time enabled them to pursue profit-maximisation while mitigating much of the risk and enabling them to roll back the offer post-pandemic.

3.7 | Changing Nature of Multi-Tasking

Multi-tasking expanded during the pandemic to facilitate new delivery models, including click-and-collect and online delivery services. In Retailer B, store assistants were required to learn the location of products so they could quickly fulfil orders alongside their other duties, such as working the checkout. Across both cases, in the absence of professional cleaners and security guards, workers were also expected to carry out cleaning duties and enforce Coronavirus rules (such as social distancing requirements and limits on product purchases). This expanded the scope of work for customer assistants but allowed food retailers to avoid the additional costs of procuring staff for these roles.

This expansion of work created intensification in a situation which was “very, very hectic at times” (Customer Assistant 6, Retailer B). For example, stores that partnered with platform delivery providers increased their sales while employing the same number of staff, as existing employees were required to pick items in addition to their usual workload:

You've got like 15- or 20-min to go and do the shopping but sometimes you can be starting one and then you get another 2 come through so you've got 15-min to do 3 lots of shopping...
(Customer Assistant 7, Retailer B)

This illustrates how new technology expanded the amount of work required from staff as they were required to take on new tasks, further intensifying the work.

3.8 | Noncontact Shopping (In-Person)

Alongside the surge in hiring during the pandemic, many food retailers expanded noncontact forms of shopping, such as self-service tills and scanners (Carré et al. 2020). Rather than risk adopting novel technologies, retailers opted to expand use of their existing technologies. This extended the reconfiguration of

the service triangle, passing the labour effort from retail workers onto the customer, with one manager stating that these systems “*pretty much run themselves*” (Store Manager 2, Retailer B). This perspective was at odds with the views of the sales assistants interviewed, who felt that overseeing self-checkouts was particularly demanding, prompting one participant to compare it to being “*like a workout*” (Customer Assistant 2, Retailer B). This sentiment reflected how the number of workers supervising the checkouts rarely increased to support higher volumes:

...there is not enough staff on [...] It's getting worse. They keep cutting back [...] On the self-checkouts there should be two people, it's too much for one person and when all of them get blocked up because they need me to do something, the queue gets massive...

(Customer Assistant 3, Retailer B)

As a result, workers experienced further work intensification and customer waiting times increased. Despite the surge in hiring during the pandemic, the number of retail cashiers and checkout operators fell from 166,800 in March 2020 to 149,500 in March 2021 (ONS 2024b). Those who remained in these roles commented that the work became increasingly pressurised and dangerous, as one worker described how they felt “*the most unsafe*” (Customer Assistant 4, Retailer B) overseeing the self-checkouts because of the limited space for social distancing.

Our analysis shows that the complexity and contingency of choices made around technological change were dependent on epidemiological requirements combined with a sustained desire on the part of employers to keep costs low. Avoiding costly investment allowed retailers to quickly revert to previous practices when the ‘new normal’ returned.

3.8.1 | Beyond the Pandemic: Adapting to Unfilled Expectations of Technological Change

After the pandemic peaked, demand for online shopping fell, temporary workers were no longer needed, and new arenas for competition emerged in which technology was seen as critical. However, there was little evidence of large capital investments in new technologies that would extend the technological acceleration narrative beyond the pandemic. This section demonstrates the messiness of technological change, which contrasts with the more deterministic view that new technology adoption follows an upward trajectory.

3.9 | Contraction of (Traditional) Online Shopping

In 2020, the UK's online-only food retailer, Ocado, was crowned an early ‘lockdown-winner’ by the media (Wallop 2020; Jolly 2020) and featured prominently in the newspaper analysis. However, this quickly changed when restrictions eased and demand for online food shopping contracted. This created significant issues for Ocado, renowned for its lack of physical stores and automated order fulfilment centres, since the

construction of warehouses is time-consuming and costly. Consequently, Ocado's capacity to immediately expand its delivery service and capitalise on the online boom was limited. Eventually, the retailer opened two new sites, but by this stage, the demand for online groceries had fallen and Ocado was unable to maintain previous levels of demand (Butler and Kollwe 2023). By contrast, Tesco and the other major retailers that capitalised on human flexibility scaled back their online provision once demand eased since the online market offered thin margins. Emerging reports suggested that Tesco shed most of the 12,000 pickers hired in the early days of the pandemic within the first few months (Nott 2020), avoiding the longer-term commitments made by Ocado. Furthermore, as the cost-of-living crisis ensued, consumer preferences for lower-priced goods purchased in-person boosted the market position of discount retailers that had resisted the move online.

3.10 | New Competitive Arenas

Superfast delivery became an alternative arena for competition immediately after the pandemic. One media outlet described it as a ‘tech arms war’ (Chambers 2021) whereby competition in grocery retailing was increasingly centred around the speed of delivery rather than price comparison (in the context of global food price inflation). However, despite the expansion of third-party delivery partnerships, rapid delivery had limited reach beyond London and other major cities. Tesco opted to expand its delivery service through a partnership with the platform Gorilla (in addition to its in-house one-hour delivery provision) (Butler 2021), yet reports suggested that this struggled to get off the ground (Nott 2022). Online food delivery has notoriously small margins, prompting press commentators to suggest that “*...there is no miracle technology coming over the hill to solve the grocers' online difficulties, pushing supermarkets to get more creative to boost their dismal digital returns.*” (Chambers 2021).

Media reporting continued to cover trials for checkout-free stores, perceived as a potential new arena of retailer competition. Copy-cat versions of ‘Amazon Go’ emerged, which mimicked Amazon's bricks-and-mortar stores (launched in 2016) that combined computer vision, data from lasers and generative AI to allow customers to pick items from the shelf and exit the store—without any interaction with a store employee (Frost 2019). Sainsbury's, Tesco, Co-op, Aldi, and Morrison announced similar ambitions to develop a more sophisticated self-service offer, following in Amazon's footsteps. However, the success of this approach was far from evident. Amazon planned to open 3000 stores by 2021, but by 2023 this amounted to only 29 stores in the US and 15 in London (Peters 2019). Although the need for social distancing created ideal conditions for this type of contact-free retailing, Amazon eventually announced plans to abandon its ‘Just Walk Out’ technology, citing cost and operational issues (Wayt 2024). Media hyperbole around the ‘end of the checkout’ then quietened down, and new concerns surrounding self-checkouts and the rise of shoplifting began to surface.

This discussion serves as a reminder that although state-of-the-art technologies may be available, they do not necessarily deliver their ‘intended’ effects since management strategies

often fail to create the conditions needed for successful outcomes (Barley 2020). In comparison, the move to increasing the number of traditional self-service checkouts in stores has proved successful, as customers became familiar with these systems during the pandemic. This complemented consumer demand for in-store shopping to help satisfy their cost-cutting priorities.

4 | Discussion and Conclusion

This article has examined how sociotechnical change has evolved in food retailing in recent years. The focus of the study was chosen without the foresight of the pandemics disruptive impact, and the collection of data before the pandemic provided a fortuitous opportunity to explore how exogenous shocks shaped employer strategies and their approach to technology adoption. As the crisis unfolded, it soon became clear that debates concerning radical shifts in work organisation due to accelerated technological change needed to be explored. By focusing on the food retail sector, this article has shown how employers largely adopted temporary technological solutions to navigate financial uncertainties, many of which were reversed once the peak of the pandemic had passed. The study has demonstrated a continuing reliance on low-wage labour in food retailing, despite periods of rapid technological expansion and contraction, highlighting the complex relationship between work, disruption and technological change.

This article responds to calls for further studies of traditional industries, providing a new dimension to our understanding of new technology and food retailing during a time of disruption (Lloyd and Payne 2021), which is becoming increasingly relevant in a world characterised by ‘permacrisis’ (Brown et al. 2023). Drawing on the historical context of the sector and examining sociotechnical change across three timeframes is critical to making sense of contemporary food retailing. Before the onset of the pandemic, the sector was considered to be pursuing an upward trajectory of technology adoption (Begley et al. 2019) with associated predictions of labour reduction (Frey and Osborne 2017). These predictions were accelerated during the pandemic, both by management consultancy firms (see Fiedler et al. 2020; McKinsey 2020a; Deloitte 2020) and mainstream media (see Smithers 2020; Wallop 2020), who foresaw a ‘big bang’ technological transformation. In the absence of empirical research in an area with context-specific dynamics, deterministic narratives have gained traction (Joyce et al. 2023) and influence how people understand technological change in workplace settings. However, our historical overview of new technology in food retailing, complemented by an interrogation of the period leading up to, during and beyond the pandemic, has demonstrated the complexity of technological change.

A key finding concerns the continued role labour has played within the sociotechnical transformation of food retail work, which is absent from much of the ‘acceleration’ narratives. SST maintains that labour costs are vital to justifying investment in new technology (MacKenzie and Wajcman 1985), yet outcomes cannot be known in advance, especially in a context rife with uncertainty. By broadening the analytical lens beyond the use of

technology, we have demonstrated how the cost and availability of labour remained central in shaping the types of technology implemented in the sector. Before the pandemic, labour hours allocated to stores were falling due to rationalisation strategies and organisational restructuring, rather than the adoption of automating technologies. Consequently, we demonstrate the historic contingency of innovation and the extent to which economic considerations are dependant on social relations, not just the availability of technology alone. This finding contributes further empirical evidence in support of Morgan’s (2019) claim that job losses can often be more accurately attributed to lean management strategies than the implementation of new technologies.

Furthermore, although it was assumed that the pandemic would lead to an acceleration of labour-saving technology, our evidence suggests that responses more closely mirrored historical patterns of technology adoption in retail. These patterns reveal a flexible model combining (relatively) inexpensive systems that require human intervention and workers employed at a (relatively) low-cost. The mass availability of human workers (due in part to the furlough scheme) presented retailers with a cost-effective route to increasing capacity by hiring temporary workers. The flexibility of both labour and the chosen technologies enabled employers to scale and descale rapidly while avoiding the costs of long-term investment. Thus, the relationship between new technology and labour is not determined by technological capabilities, but by the priorities and strategies of organisations that own and operate them. As others have argued, technologies such as EPOS systems and bar codes have long been used to increase sales through targeted marketing strategies and consequently demand for labour (Newsome et al. 2013). We also find that technology use during the pandemic increased demand for labour by enabling customers to purchase items more freely in a context where close contact was restricted. This resonates with Spencer (2018: 8) critique of end-of-work predictions which often “...fail to see how the growth of work and the progress of technology can go hand-in-hand”.

The analysis has also contributed to the area of SST research that has rejected linear models of innovation (Williams and Edge 1996; Russell and Williams 2002) which assume that technology adoption is incessantly growing. We have shown how technology use initially expanded and was later rolled back in response to the fluctuating context of the pandemic. As lockdowns eased, the anticipated adoption of e-commerce in UK food retailing failed to materialise as predicted at the start of the pandemic (McKinsey 2020b), with online sales plateauing at 3 percentage points above pre-pandemic levels (ONS 2024c). This was problematic for online-only food retailers such as Ocado, which invested significantly in extending its permanent operations. By contrast, traditional food retailers swiftly reduced their online offering when restrictions were lifted, thus minimising the impact of the low margins associated with online grocery shopping (Eley and McMorro 2020). This response was possible in part because of outsourcing arrangements with third-party delivery partnerships that were quickly rolled back when market demands changed, but also because many new hires were based on temporary contracts. This finding supports existing contentions that technological

implementation does not always result in intended outcomes (Barley 2020), particularly in cases where the solution is no longer deemed suitable or profitable. We posit that food retailing, which constitutes a sub-section of the vastly diverse retail sector, has followed a different trajectory than the wider sector, which has sustained a slightly higher uptake in online sales post-pandemic (7.7 percentage points) (ONS 2024c). This is partly attributed to consumer preferences for buying food in person (Magalhães 2021), which goes some way towards explaining why the specific technology of self-service checkouts was sustained beyond the pandemic, as shoppers became more accustomed to using these systems.

While food retailing is neatly positioned for understanding the complexity of sociotechnical change, we recognise that there are unique features to our study. We are in quickly evolving times and future shocks may well have different and unexpected impacts on the organisation of low-wage work relative to technology. Nevertheless, this discussion provides fertile ground for future research on the complex evolution of socio-technical change postcrisis in bricks-and-mortar retailing, but also across the supply chain more broadly. Furthermore, there remains an increasing need for a critical understanding of how crises (and the recovery from crises)—whether geo-political, economic, epidemiological or ecological—are likely to influence the future of work in traditional industries.

Endnotes

- ¹ In 2022, 968,000 people are employed in retail stores where food predominates (70% of whom work part-time). Twenty years prior, 1,361,000 worked in the sector (64% of whom worked part-time) (ONS 2024a).
- ² Number of articles by retailer: Tesco (150), Sainsbury's (105), Aldi (48), Morrisons (48), Ocado (44), Lidl (38), Asda (36), Waitrose (21), Co-op (11); and publication: The Times (115), The Guardian (85), The Grocer (78), The Telegraph (47), The Mirror (41), Daily Mail (35), The Sun (33), Financial Times (25).

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