Digital Technology for Unmasking Labour Exploitation in Supply Chains

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Abstract. This paper aims to understand how digital technology can support businesses in unmasking labour exploitation in supply chains towards more effective remediation. It presents a case study using empirical evidence collected through expert interviews, document analysis, and a survey. Our findings illustrate that digital technology has the potential to support businesses in identifying cases of labour exploitation in supply chains during social compliance audits if tools are used within enabling environments. This research constitutes an original analysis of the intersection between corporate social responsibility and social compliance auditing, digital technology, and the critical issue of labour exploitation in supply chains. It identifies a flawed logic in expecting workers to use technology to report on exploitation without providing necessary scaffolding or support structures. We identify the role of intermediaries or surrogate accountability as critical in assisting workers and transforming working conditions.

Keywords: Digital technology, labour exploitation, social compliance audits, supply chains, worker reporting.

1   Introduction

Global supply chains are complex networks of suppliers and manufacturers, that together produce goods for sale to consumers. As an example, the supply chain for a pair of running shoes would consist of multiple components that have been harvested (Tier 4 supplier: e.g. cotton farming, leather hide), processed (Tier 3 supplier: e.g. cotton weaving, leather tanning; Tier 2 supplier: e.g. textile embroidery) and manufactured (Tier 1 supplier: shoe lace, rubber sole, leather upper factories) across different countries and regions. From an economic standpoint, these global supply chains "take advantage of the best available human or physical resources in different countries, with a view of maintaining their competitiveness by augmenting productivity and minimizing costs" [1, p. 1]. Large corporations do business with hundreds or thousands of first-tier suppliers, and tens of thousands of higher-tiered suppliers. For policymakers in developing countries, global supply chains offer potential for "employment, improvement in technology and skills, productive capacity upgrading and

export diversification into more value added… [which in turn] would increase their attractiveness for more foreign direct investment" [1, p. 1].

With the passing of the California Transparency in Supply Chains Act (2010), UK's Modern Slavery Act (2015), France's Duty of Vigilance Law (2017) and Australian Modern Slavery Bill (2018), businesses are being forced to be accountable for labour abuses that occur not only in the first tier, but across their extended supply chains. Grant and Keohane characterise accountability as consisting of three elements: standards; information; and sanctions. The term accountability "implies that some actors have the right to hold other actors to a set of *standards*, to judge whether they have fulfilled their responsibilities in light of these standards, and to impose *sanctions* if they determine that these responsibilities have not been met" [2, p. 29]. The third element, *information*, refers to the collection of evidence to enable those holding actors to account to justify any sanctions that are imposed.

A primary tool for accountability within global supply chains is the social compliance audit. This tool is used to monitor labour conditions and health and safety standards within corporations' supply chains. Social compliance audits are varied in form, with some corporations using a self-regulatory approach, complete with self-declarations; to private regulatory systems with third party certification (refer to Section 2.3 for more details).

We position this research against this backdrop, and in this paper describe our case study of the current practices of private auditors in Asia-Pacific within the garment, toy and retail manufacturing sectors of large multinational corporations. Our aim was to understand current social compliance auditing practices, and to identify the key enablers and constraints to their practice. In particular we aimed to understand how digital transformation has impacted and could potentially impact the ability to support auditors to proactively and consistently collect standards-aligned worker feedback in a way that could be used to develop an evidence base to inform remedy and other actions.

2 Background

This work builds on the understanding that labour exploitation can be mapped onto a spectrum, ranging from what the International Labour Organization (ILO) refers to as 'decent work' at one end, through various labour and criminal law violations, to extreme exploitation or 'forced labour' at the other [3]. An experience of exploitation does not sit statically on the continuum: changes in personal factors (e.g. age, health), situational factors (e.g. migration status) and circumstantial factors (e.g. unemployment) make a worker more (or less) vulnerable to exploitation [4]. In this way, we can see that work situations that begin as consensual and mutually beneficial, can transform to oppressive and exploitative environments.

Studies in the fields of supply chain management and auditing often characterize factory owners and multinational corporations as 'power wielders' who in some cases violate laws and regulations, forcing workers into situations of labour exploitation. Workers or 'accountability holders' are hampered in their ability to prevent these

breaches by structural factors including poverty, lack of education, prohibition from organizing, being seen as an easily replaceable workforce, and a lack of alternative forms of employment. It is worth noting that factories themselves suffer from power asymmetries too, with respect to large multinational buyers. While factories are more powerful than the workers themselves, they are often far less powerful than the buyers. Rubenstein notes that the power asymmetry is "exacerbated by the absence of domestic and international institutions that make sanctioning powerful actors (especially transnational actors) easier" [5, p. 617]. Ultimately, the solution for this asymmetry is to reduce the inequality between workers and their employers, and in turn employers and buyers, but this is a long term, complex (and some may say idealistic) goal. As a 'second-best', Rubenstein points to the need for 'surrogate accountability' in countries marked by weak institutions, high levels of corruption, and the inability of governments to enforce and implement regulations [5]. Surrogates involve an actor who substitutes for an accountability holder in one or more phases of 'setting standards, finding and interpreting information, and most importantly sanctioning the power wielder if it fails to live up to the relevant standards [5, p. 618]. This section now turns to the three elements of accountability, mapping them to the context of social compliance auditing within global supply chains.

2.1   Standards and Sanctions

There are a number of state-based, private and transnational trends in governance / regulation of labour and human rights standards for businesses. From a state-based perspective and stemming from the definition of labour exploitation as a violation of criminal or labour law, a key standard and list of sanctions can be found in state-based legal frameworks. In countries with weak laws and low state capacity (or motivation) to sanction exploitation, middle tiered buyers often require sellers to be audited by private bodies. The Accord for Fire and Building Safety in Bangladesh (The Accord) is a prime example of a cross-sector, private industry response to regulate conditions of work. As a results of a number of highly publicized workplace tragedies in Bangladesh in 2012 and 2013, public outcry from consumers influenced multinational buyers to pressure Bangladeshi suppliers with respect to building safety compliance [6]. As a direct response to this pressure, The Accord was developed, committing factories to maintain minimum building safety standards. This framework included independent safety inspection of signatory factories, with corrective action plans required to address violations before factories would receive orders from signatory brands.

From an international perspective, the UN Protect, Respect and Remedy Framework for Business and Human Rights (referred to as the Ruggie Framework) was passed in 2008, recognizing: the state's duty to protect workers against human rights abuses from third parties (including from multinational corporations); the corporate responsibility to respect human rights of workers; and the rights of victims to access remedy (both through formal and informal channels) [7]. Bilchitz critiques this framework, calling for corporates to be obliged not only to include obligation to avoid

harm ('respect human rights'), but to "contribute actively to the realization of fundamental rights" [8].

Building on this framework, Wettstein argues for a capability-based approach to remedial action, based on an actor's capability to remediate human rights abuses within their domain, instead of human rights-based approaches that delegate that responsibility to governments alone [9]. Wettstein's approach places responsibility on businesses to protect and respect human rights, and to address the root causes of any human rights violations through compliance mechanisms, instead of simply treating its symptoms [9].

2.2 Information

A key role for technology in supporting accountability can be found in collecting, collating and analyzing information about power wielder's compliance with standards. 'Worker voice' or 'worker empowerment' tools have received much attention recently, supporting the collection of data from supply chains, to serve due diligence as well as to provide workers with access to grievance channels. A recent landscape analysis by Berg, Farbenblum and Kintominas finds that the most common form of worker voice tool takes the form of a worker survey, using either automated calling or texting of workers, seeking feedback on a small set of questions around their working conditions [10]. There are few tools that aim to build capacity of private auditors or labour inspectors, to support their on-site labour inspections or audits (e.g. [11]). Berg *et al.* note three key concerns for the use of technology to gather information from workers. Firstly, they question the reliability of information gathered through the tools to inform decision making. Second, they question the value-add to workers in providing data to companies, noting that it may be used to benefit suppliers and not result in changes to structural causes of exploitation for workers. Finally, not only do Berg *et al.* suggest that workers may not receive any outcomes from participating in audits, but that participation may also create new risks of retaliation from employers.

The Worker Engagement Supported by Technology (WEST) Principles are a set of guidelines designed to support efforts to engage workers in global supply chains [12]. These principles guide across four phases of design, engagement, analysis, and use; mapping onto user-centered design approaches. For completeness the principles are included below:

DESIGN	1. Start with Integrity and Purpose
	2. Use Worker-Centric and Inclusive Design
	3. Build Trust with Workers
ENGAGE	4. Facilitate Uptake and Ownership
	5. Manage Security and Risk
ANALYSE	6. Evaluate Outcomes and Processes
UTILISE DATA	7. Inform Decisions and System Changes
	8. Collaborate and Share Learnings

Table 1. WEST Principles (adapted from) [12]

Despite initiatives such as the WEST Principles aimed at guiding the development of new tools to engage workers in global supply chains, Agre challenges the idea of technology as necessarily a positive (or negative) force to bring about change [13]. Instead, he notes that technology works as an amplifier of underlying positive or negative human intent and capacity. Toyama builds on this notion with amplification theory, viewing technology as a means to an end and not an end in itself, explaining that "People have intent and capacity, while technology is merely a tool that multiplies human capacity in the direction of human intent" [14, p. 77]. This idea was explored in a recent study regarding the development and adoption of a worker engagement tool used by frontline responders to screen workers in vulnerable situations [15]. Findings showed that, although the tool could support frontline responders in overcoming issues of language barriers, privacy and trust, the tool was not a solution to improve worker screening, but rather a tool to support this process, where the impact of positive and negative intentions of workers the frontline responders were critical on whether the tool was used for its purpose.

2.3   Social compliance audits

A social compliance audit is an instrument used to measure, monitor and evaluate the performance of an entity against a standard. Typical standards used include human rights standards such as SA8000[1], or ILO's Fundamental Principles and Rights at Work[2]. Social audits are often used as part of Corporate Social Responsibility (CSR) strategies, which aim at helping companies to be accountable to their stakeholders [16]. Critics of social compliance audits refer to them as ritualistic strategies, designed to maintain existing inequalities [17], promoting a false transparency while overlooking socio-economic drivers that set the ground for exploitative practices [18], ultimately contributing for a "human rights minimalism" paradigm" [19, p. 740]. Proponents note that when done well, they support democratic and legitimate governance processes [20].

Historically, audits have comprised document review, interviews with factory management, and site observations [20]. As due diligence actors seek to answer the corporate demand for identifying instances of labour exploitation, it has become widely accepted that workers need voice in depicting working conditions [21]. More recently, audits have included worker interviews, although these are not without their own logistical and practical challenges [22]. The success or failure of worker interviews often comes down to the quality of skills of the auditor. In a short space of time, auditors are required to gain the trust of workers, overcome language, culture and sometimes gender divides, and identify potentially hidden situations of exploitation. Yet, as Dellaportas explains, despite the precise and regimented nature of social auditing which derives from the accounting professional, "One unfortunate side-effect of accounting as a procedural technology is its capacity to deny the social aspects of

[1] https://sa-intl.org/programs/sa8000/
[2] https://www.ilo.org/declaration/lang--en/index.htm

business activities when accounting processes are separated from its social framework" because it "diminishes a manager's ethical ideal by disconnecting managers from the effects of organizational practice when accounting dwells predominantly on technical matters and organizational performance rather than organizational impacts" [23]. As a result, auditors' accounting training and focus on procedures can hinder the social aspects that are necessary to effectively conduct worker interviews, such as trust, that can lead to the reporting of situations of exploitation.

3 Research methods

The research questions that this study aimed to answer are:
- What are the current worker feedback mechanisms used in in-person, social compliance audits?
- What are the key constraints to their worker feedback mechanisms?
- What role do stakeholders believe that technology could play to support in-person audits?

This section describes the research approach used in this study, detailing the selection criteria for participants and the research design.

3.1 Case Study

This study uses a critical realist case study approach that explores the problems perceived by key stakeholders in social compliance audits, as well as their perceptions on the use of technology to support their audits. Adherents of critical realism pose that aspects of the social world can only be understood within the context that they occur. Therefore, we used a mixed-methods approach, including expert interviews, document analysis and surveys to uncover not only what the participants did, but to interrogate the reasons that informed their actions. Critical theorists argue that qualitative studies cannot be focused simply at the level of everyday actions but must also interrogate the social and cultural structures that maintain and form them, in order to support informed action that could change them [24, p. 110].

Simons defines a case study as an in-depth study of a particular phenomenon in its 'real life' context [25]. It is research-based, inclusive of different methods and evidence-led, where 'The primary purpose is to generate in-depth understanding of a specific topic … to generate knowledge and/or to inform policy development, professional practice and civil or community action' [25, p. 21]. Case studies use multiple sources and methods of generating evidence to analyze different aspects of a phenomenon [26], and improve reliability, transferability (external validity), and trustworthiness (internal validity) of findings [27]. A case study is not only a technique for collecting data but a methodological approach that includes a number of qualitative and quantitative data-gathering methods [28, p. 103].

3.2 Research design

This research study draws together the findings of expert interviews, document analysis, and survey aimed at answering the three research questions posed above.

- **Expert interviews.** Participants were recruited for the expert interviews using expert sampling, with one author reaching out to members of a Hong Kong-based business alliance to publicize and solicit participation in the research. Based on this, 15 supply chain experts from eight major corporations in the garment, toy and retail industries self-selected to participate in expert interviews. After consent was obtained, experts were questioned using a semi-structured interview process around the three research questions detailed above. These interviews lasted approximately one hour. After completing the interview, one author transcribed and analyzed the transcripts of the interview.
- **Document analysis.** Of the eight corporations that participated in the expert interviews, four provided copies of their worker interview questionnaires that are used in social compliance audits within their supply chains. We analyzed these questionnaires in order to understand the type of information collected during worker interviews. The questionnaires presented a mix of open-ended questions, and closed questions.
- **Survey.** One author advertised the auditor survey through a Hong Kong-based business alliance of 27 brands, resulting in 203 auditors from 16 countries across the Asia-Pacific Region self-selecting to participate. The 32-question survey was conducted in December 2018, aimed at collecting information on the several aspects of workers' interviews and access to technology [29]. These responses were analyzed using a combination of bottom up and top down coding techniques.

4 Results

This section presents the results of the study, according to themes that arose across the expert interview, document analysis and survey.

4.1 Current feedback mechanisms

During expert interviews, company representatives shared that they use a variety of social audit frameworks, such as internationally recognized third-party programs, their own, or a combination of both. While some corporations tend to outsource most or all of their auditing mandate to third-party service providers, some companies maintain in-house audit teams, and a few exclusively use internal auditors. Survey respondents noted that worker interviews are a mandatory component of any audit framework, a practice described by 99% (n=201) of auditors. Almost all social compliance audits include interviews with workers, with 64% of auditors specifying that it takes them more than 10 minutes per interview. Challenges faced during worker interviews included not being able to interview a representative sample of workers given the size of some factories, time constraints and language barriers.

Our document analysis revealed that all questionnaires collected some personally identifiable information, such as the employee's name, identity documents (ID), badge number, assigned department, home country and date of birth. As well as collecting personally identifiable information, survey findings highlighted limited privacy for worker interviews, with only 12% of respondents indicating that they exclusively interview workers individually. Despite collecting personally identifiable information, experts raised concerns of factory owners being able to trace complaints back to individual workers. Eighty five percent (85%) of survey respondents said that they interview workers either individually or in groups. Survey respondents mentioned that interviews are conducted in places with little privacy, such as workstations (61%), during the workers' meal (17%), or in rooms with other people (4%).

When asked about their selection criteria for interviewing workers, the most common factor cited by auditors was their ability to speak the same language as the worker (76%). While this in itself should not be a surprise, it has serious implications for the inclusivity of worker interviews, limiting them to the language capabilities of the auditor. Other aspects mentioned were gender (70%), job post (35%), pregnancy (11%), ethnicity (proxy for migrant worker status) (7%) and physical condition (9%).

Across the different companies, experts described different approaches for conducting worker interviews. While some companies provide worker interview questionnaires (which were later forwarded to researchers for review), others shared that there is flexibility in the type of questions asked, leaving it up to the instincts of the auditor to steer the conversation. Survey respondents indicated that once collected, 41% used digital tools for storing data. Some respondents raised privacy concerns regarding how data was kept and handled.

Document analysis found that all interview questionnaires covered areas such as wages and benefits, working hours, health and safety and labour conditions. Although some questions were consistent with ILO's Indicators of Forced Labour[3], no questionnaire systematically included all indicators. This finding correlated to auditor responses on the survey. One key concern raised in expert interviews was the apparent coaching of workers by supervisors. They described different techniques they use to overcome these issues such as rephrasing questions and changing the order in which they ask questions to reduce the risk of 'workers reciting a script'. This concern was also raised in the auditor survey, where 40% of respondents described having encountered workers appearing to be coached during interviews.

During the interviews, most experts mentioned that auditors are trained on identifying exploitation and provided with standard operating procedures (SOPs) to follow. These SOPs include a thorough review of factory documentation, interviews with

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[3] ILO's Indicators of Forced Labour, presents a typography of exploitative conditions of work: abuse of vulnerability, deception, restriction of movement, isolation, physical and sexual violence, intimidation and threats, retention of identity documents, withholding of wages, debt bondage, abusive working and living conditions, and excessive overtime [30]. When we see forced labour simply as an end of a continuum of exploitation, we argue that these same categories can be used to understand exploitation in any work environment.

management staff, and further worker interviews. Although 91% of survey respondents indicated receiving training on how to select cases for further investigation, only 1% mentioned following guidelines for deciding on furthering investigation on a case, and 4% for when identifying a vulnerable worker that requires assistance. Survey respondents indicated a variety of drivers for investigation, including: unclear, inconsistent or suspicious information (34%); urgent, critical or unusual cases (17%); evidence (11%) and many workers reporting the same issue (8%).

When a worker is identified as vulnerable and requires assistance, 41% of the survey respondents indicated conducting further investigation, including increasing the sample of workers screened (4%). Twenty five percent (25%) indicated reporting and consulting with their team, clients or the facility management; ensuring protection of the worker or their information (15%); and finding potential solutions with the worker (12%) or comforting the worker (12%).

4.2   Constraints to feedback mechanisms

Based on the expert interviews and results of the auditor survey, we identify four key constraints to the worker feedback mechanisms currently used in social compliance audits:

- Time constraints. Worker interviews are one of many tasks that auditors are required to undertake as part of a factory inspection. This forces auditors to choose between interviewing few workers, or interviewing workers in groups.
- Privacy. There is often a lack of privacy in interviews, with workers being questioned in front of other actors (either in groups, or in public spaces). Very few factories have private spaces that can be used in order to hold individual interviews. Workers fear being overheard, and in many cases, participants note that factory employers teach them a script to recite to auditors.
- Communication. Auditors and workers face language barriers, which impact the inclusivity of worker interviews, and the accuracy of those that are undertaken despite the barriers.
- Training. While SOPs are provided by companies, auditors described using a gut feel. With well-trained auditors with expertise in a variety of different legal frameworks, this technique could provide excellent results. However, in cases where language barriers exist, or time constraints affect the amount of time auditors can dedicate to worker interviews, this lack of consistency could result in inaccurate findings.

4.3   Perceptions and use of technology

During the expert interviews, many of the participants knew about one or more existing worker grievance tools and mentioned that they would most likely only implement one tool (if at all) as using multiple platforms to collect worker feedback on top of their auditing report systems would be too confusing. They also mentioned that

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some factories already have their own worker engagement apps in place and that 'it is a challenge to get workers to download multiple apps.'[4]

Survey findings showed that all auditors had smartphones and internet access, although 19% reported weak signal and poor reception when trying to access internet during audits. Survey respondents indicated using their mobile phones at work for searching relevant information (33%) and keeping records (12%). A few respondents also mentioned using their phone for translation (5%) and for reporting bribery (4%). One respondent said: 'if a facility is offering bribe in that case the auditor may record the voice recorder in-order to collect evidence for the bribe offering.'

Our survey revealed that auditors have a strong positive perception of the benefits of technology for their work. One of the respondents said, 'The world is changing and it is the era of artificial intelligence and supercomputing, I am sure that the incorporation of technology will be helpful for the workers' condition assessment.' 98% of survey respondents agree that technology can be useful in their jobs and 92% think that technology could be useful to help to assess workers' conditions.' A respondent said that 'using technology in auditing can make evaluation more objective and effective.' Among reasons identified for supporting why technology can be useful in audits, respondents mentioned that technology allows to search and check for information (30%); makes evaluation more effective, transparent and objective (22%); is convenient and useful (15%); saves time (11%); improves communication (9%); facilitates data processing and storage (3%); and improves accuracy (3%). Another respondent said 'technology can help to save time for manually works and provide more accuracy or persuasiveness'. Other claimed 'technology may help processing the data fast and give a tentative picture'. 6% of survey respondents mentioned that technology empowers or supports workers as 'technology makes it easier for worker[s] to voice their needs'.

5 Discussion

This section provides a critical reflection on the role that digital technology, specifically worker voice tools, can play to unmask labour exploitation in supply chains. It builds on Agre's assertion that digital technology in itself can make no change, but at best, will amplify existing forces [13]. Building on this, Toyama notes that "while technology can be used to augment, improve, or streamline development capacity, it cannot make up for the lack of human intent and capability" [14, p. 76]. Toyama expands further, highlighting the mechanisms by which technology amplifies capacity: differential access, differential capacity, and differential motivation.

5.1 Differential access

The notion of access refers to physical access as well as information accessibility. As an example, if a worker can only report cases of exploitation on their own internet

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[4] Stakeholder meeting, Corporate Representatives (Audit and Sustainability managers), Hong Kong, 21 June, 4 July and 10 August 2018.

enabled devices, then providing a tech-based solution further disadvantages the worker with a 2G phone (or access to an internet enabled device but with no data bundles). In these cases, the access burden of participation would rest heavily on workers. From our expert interviews and surveys, we found that unlike workers, almost all auditors have internet enabled mobile devices that they use regularly for work purposes. By targeting auditors with the burden of device ownership / maintenance / installation of worker voice tools, this means that there are no assumptions about access on the worker.

Turning to information accessibility, if worker voice tool targets workers from a specific demographic (either by assuming a level of literacy or by providing support in a limited set of languages), then tech-based solutions serve to further disadvantage illiterate (or illiterate in that language) workers. By supporting text free and voice interfaces, translated into multiple languages, differing information accessibility issues could be addressed. This would also serve to address key constraints identified by auditors of language barriers as well as privacy issues, when audio interfaces are played using a set of headphones.

5.2   Differential capacity

Differential capacity refers to disparities amongst key stakeholders, including education, social skills, and influence [14, p. 77]. Applied to the context of social compliance audits, this refers to the differing ability of stakeholders to use technology for their own purposes, a factor that reinforces pre-existing power imbalances between employers and factory workers. To further support workers in their differential (and in most cases lesser) capacity, we use Rubenstein's framework of surrogate accountability to justify the need for surrogates to intermediate on behalf of accountability holders to hold power wielders to account. Rubenstein explains that, "the difficulties faced by accountability holders who are poor and vulnerable are exacerbated by the absence of accessible, fair, and efficient institutions that mitigate the effects of poverty and vulnerability" [5, p. 623].

Many current worker voice tools take the form of tip-off services (SMS based, hotlines, helplines), providing an electronic format for the traditional complaints / suggestion boxes found at factories [12]. These tools should be applauded in their ability to support worker to privately disclose the exploitative conditions that they face. However, when considering the huge power disparity between workers and power wielders, our concern relates to the capacity or agency that workers believe they have to report exploitation without the support of an intermediary.

Instead, in this research we suggest a focus on building the capability of social compliance audits, especially involving independent auditors, as they are uniquely positioned to uphold the three elements accountability - standards, information and sanctions – on behalf of factory workers. Social compliance auditors measure workplace compliance against a particular set of standards. From our auditor survey, 99% of participants describe worker interviews as a key component of social auditing. They note that their current practice was complicated due to language barriers, time constraints, a lack of privacy, and issues identifying cases of exploitation.

From our survey, auditors suggested that their own capacity to identify cases of labour exploitation could be supported through the support of digital technology. Our findings suggest that a simple mobile application (to be installed on the auditors' mobile device) could provide a consistent manner to interview workers about the conditions of their work. When combined with a set of headphones, a set of simply worded, yes/no questions could be played in the workers own language, giving them a chance to respond privately (and anonymously) and report perceived exploitation at work. Multiple workers could be interviewed at the same time, simply by providing a further set of low-cost mobile devices (and headphones) to auditors. By combining responses across a group of workers, their privacy would be protected, and an auditor could use this information to inform the next stages of their in-person site inspection. For example, if even one worker who was interviewed reported an incidence of wages being withheld, the auditor could intermediate on behalf of workers, and request full documentation of payment stubs from factory officials.

5.3   Differential motivation

In carrying out this research, we had the opportunity to work together with brands, corporate social responsibility experts and auditors who were intrinsically motivated to assess working conditions and remediate any cases of exploitation that were identified. However, it is not always the case that actors within supply chains aim to provide decent working conditions for workers.

Within the context of workplace inspections, the potential for technology to effectively uncover workplace exploitation depends on how auditors and workers use them. If both workers and auditors have positive intentions for its use, technology will amplify their intent and lead to an accurate identification of workplace conditions [15]. But if a well-intentioned auditor is faced with a report made by a worker with negative intentions – that is having a bad day or wishes to bring harm against their employer – then the auditor will use technology to and unwittingly lodge a false report. In the same way, if a positively intentioned worker wanting to report workplace exploitation is met by an unwilling auditor, the reporting technology tool may be used to bring about more harm to the worker, with the auditor sharing details of confidential reports with exploitative employers [15]. This shows that, despite the opportunities that technology offers in supporting accountability mechanisms in supply chains through social compliance auditing, whether it is in upholding standards, sanctions or collecting key information, it is also important to critically reflect on its real ability to bring about change.

While technology can play a key role in enabling effective reporting of exploitation and consistent ways to collect this information, it is not capable alone to make the structural changes necessary to achieve decent work environments. This is because "technologies are not embedded in a system of accountability … they are just data gathering tools—it's tech in a vacuum if not a part of a sound ground game with safeguards, trust, feedback, and engagement" [21, p. 157]. When thinking about worker reporting tools used for social compliance auditing, Rende Taylor and Shih explain that "There is a flawed logic here that expects migrant workers to step up and claim

the rights they don't have" [21, p. 157]. Business due diligence tools must purposely prioritise enhancing the workers' voices, and using that feedback effectively; otherwise, "their assumptions of pathways to impact may be flawed in their assumptions of the power of vulnerable populations to claim their rights in situations of labour exploitation" [21, p. 157].

Even if such technology was in place, Berg et al. present three concerns regarding its use to gather information from workers [10]. Firstly, the reliability of information used to make decisions, using Toyama's terminology, would be dependent on the workers' intent. This information could result in unfair sanctions on the one hand or serve to discredit real cases of exploitation on the other. Secondly, Berg et al. question the value for workers in participating and providing information for company due diligence purposes. If their input does not result in improvements in their working conditions (structural causes of exploitation), this may serve to break workers' trust in similar feedback mechanisms, potentially preventing them from reporting again.

The third concern refers to the safety of workers when using feedback mechanisms, particularly the risks of reprisals by employers for reporting wrongdoings. This highlights the importance of ethical handling of worker feedback to ensure the confidentiality of the reporting, as well guarantee the worker's privacy when technology is used.

Despite these concerns, our findings highlighted that if carefully designed and entrenched in a system that nurtures intent and capacity of key stakeholders, there is a role for a mobile app to support auditors to identify labour exploitation within social compliance audits in supply chains.

6   Conclusion

Worker voice tools are not a silver bullet. In and of themselves, they cannot 'solve' labour exploitation within supply chains. However, if carefully designed and used by well-trained and equipped auditors, they can help factory workers to overcome power asymmetries and report the conditions of their work. Of course, these tools in themselves are just one small component in a much broader social compliance auditing system, including the negotiation of standards, data gathering, and in some cases sanctions on exploitative working environments.

Drawing from a series of expert interviews, document analysis and a broad auditor survey, and with the three mechanisms of amplification in mind, the paper suggests a specific way that digital technology could be used to unmask labour exploitation in supply chains. Using Rubenstein's surrogate accountability, it identifies a role for intermediaries (or surrogates) to aid worker to overcome power asymmetries, holding power wielders to account for their conditions of work. This paper highlights key factors of human and institutional capacity and intent which are crucial to understand and support, to ensure that data that is gathered is used to promote justice and remediation.

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