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Invisible Hands Behind the Algorithm: Cyber Exploitation and Child Labour in Hotel Supply Chains

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Abstract

The digital transformation of the hospitality sector has introduced algorithmic management systems that optimize efficiency, cost, and labour allocation across hotel supply chains. However, beneath this technological advancement lies an emerging form of exploitation, algorithmic complicity, where automated systems inadvertently enable or conceal the use of child labour in outsourced services such as housekeeping, laundry, and catering. This research examines how artificial intelligence (AI) and digital procurement platforms contribute to cyber exploitation by prioritizing productivity and profit over ethical labour compliance. Employing a doctrinal, analytical, and qualitative methodology, the study analyses relevant Indian and international legal frameworks, including the Child Labour (Prohibition and Regulation) Act, 1986, the Information Technology Act, 2000, and ILO conventions, alongside corporate digital governance standards. The findings reveal critical regulatory and ethical gaps in algorithmic accountability, highlighting how opaque AI systems obscure violations in multi-tiered hotel supply chains. The paper concludes by recommending algorithmic transparency laws, blockchain-based auditing, and mandatory digital due diligence to ensure ethical labour practices and prevent technology-driven exploitation in the hospitality industry.

Keywords: algorithmic complicity, cyber exploitation, child labour, blockchain auditing, hospitality industry

Introduction

The increasing integration of advanced technologies into hotel supply chains has not only transformed business operations but has also created sophisticated layers of invisibility that allow exploitative labour practices, particularly child labour, to persist unnoticed. This phenomenon, often referred to as algorithmic opacity, arises when automated systems and digital platforms prioritize operational efficiency, cost-cutting, and speed over ethical considerations and human rights compliance. As hotels outsource critical functions such as housekeeping, maintenance, food services, transportation, and supply delivery through algorithmic procurement platforms, their direct accountability for the conditions under which these services are provided becomes diluted. Algorithms are programmed to select vendors based on price, speed, and ratings, not on the legal or ethical status of the workforce. Consequently, exploitation can be embedded deep within the subcontracting chain, with children working in informal, low-wage, or unsafe environments, far removed from the visible core of hotel operations. This exploitation remains hidden behind technology because digital systems are not designed to detect or disclose labour rights violations; they are built to optimize performance metrics. For example, a hotel's digital management platform may show that a room was cleaned quickly and at minimal cost but will not reveal that an underage worker performed that task under exploitative conditions. Subcontracting and platform-based employment models fragment responsibility among multiple actors; hotel chains, digital intermediaries, vendors, and local contractors, creating legal grey zones where accountability becomes difficult to establish. Even when child labour is used indirectly, the primary hotel brand may claim ignorance or lack of control, using the complexity of digital systems as a shield against liability. This creates an ecosystem where exploitation thrives quietly, masked by the efficiency and speed of technology. The cyber dimension of this problem makes it even more complex. Recruitment of underage workers, coordination of informal labour, and payment for services often occur through encrypted messaging platforms, digital wallets, or unregulated online job networks. As a result, the exploitation does not leave clear legal or physical trails, making detection and enforcement difficult for regulators. Child workers are frequently employed through informal channels, such as small contracting agencies or platform-mediated gig work, where age verification and labour law compliance are virtually non-existent. Additionally, many existing legal frameworks have not kept pace with technological advancement. Labour laws traditionally focus on physical workplaces and direct employer-employee relationships, while cyber laws primarily address issues like hacking, data protection, and cybercrime, not algorithmic labour exploitation. This regulatory gap allows companies to benefit from exploitative practices without technically violating existing legal norms. In this way, technology serves as a veil that conceals exploitation, enabling multinational hotel chains to maintain clean public reputations while exploitative labour practices persist in their supply networks. In short, the core problem is not merely the existence of child labour in hotel supply chains, but its invisibility through algorithmic systems and digital intermediaries. This hidden nature makes it significantly harder to detect, regulate, and eradicate, allowing exploitation to continue unchecked. To address this issue effectively, it is essential to expose and analyze the intersection between technology,

labour practices, and legal accountability, ensuring that technological innovation does not become a tool for concealing human rights violations.

Background

The rapid advancement of automation and digital technologies has fundamentally transformed the way hotel supply chains operate, reshaping nearly every aspect of the hospitality industry. Traditionally, hotel operations relied heavily on manual coordination, from managing bookings and staffing to procurement and housekeeping. Today, these functions are increasingly integrated into digitally automated platforms that use artificial intelligence (AI), machine learning, Internet of Things (IoT) devices, robotics, and algorithmic management systems. This digital transformation allows hotel chains to operate more efficiently, reduce costs, predict consumer demands, and optimize resource allocation in real time. For instance, automated procurement systems streamline the sourcing of goods and services; digital housekeeping management tools track room cleaning schedules and workforce productivity; AI-driven booking engines match customer preferences with room availability; and supply chain software manages everything from linen and toiletries to outsourced services. This integration creates a seamless network of suppliers, contractors, and workers who are connected through algorithmic platforms rather than traditional hierarchical structures.

One of the defining features of this transformation is the platformization of supply chains. Large hotel groups now rely on digital procurement and outsourcing platforms that allow them to contract multiple vendors and service providers remotely. Housekeeping, maintenance, catering, and logistics are increasingly being outsourced through algorithmic systems that automatically select vendors based on cost, speed, ratings, and availability, often with little or no direct human oversight. While this leads to faster and cheaper service delivery, it also results in complex and opaque labour networks, where the original hotel may have no direct relationship or visibility over the actual workers delivering services. This is particularly significant in developing countries, where hotel chains often contract informal labour through digital intermediaries, creating layers of subcontracting that are difficult to monitor and regulate. Automation has also accelerated real-time monitoring and predictive analytics, allowing hotels to make quick operational decisions. AI tools track inventory levels, monitor staff attendance, and even predict peak seasons to adjust workforce requirements accordingly. On the surface, this appears efficient and innovative. However, beneath this streamlined surface, it also creates opportunities for exploitative practices to remain hidden behind technology. When algorithms make decisions based purely on cost and speed, they may inadvertently encourage the use of cheaper, informal, and often underage labour, especially in outsourced segments such as cleaning, laundry, or supply delivery. Because hotel management systems primarily track services and costs, not worker identities, ages, or working conditions, child labour can remain invisible within these digitalised supply chains.

Moreover, digitalisation has enabled cross-border labour flows without corresponding legal accountability. A hotel in one country can hire service providers from another through a platform, bypassing local labour protections and complicating enforcement. Algorithmic platforms, often designed to maximise efficiency, can mask exploitative practices, as they fragment responsibility across multiple actors, the platform provider, hotel management, third-party contractors, and local suppliers. This lack of traceability and accountability poses a serious challenge to labour governance and human rights enforcement in the hospitality sector.

In essence, automation and digitalisation have revolutionised hotel supply chains, bringing remarkable operational advantages but also embedding new layers of risk and opacity. While these technologies promise efficiency, they also create conditions in which exploitative labour practices, including child labour, can flourish unnoticed. Understanding this technological transformation is therefore crucial to analysing how modern supply chains can both enable economic growth and inadvertently conceal serious human rights violations. This background forms the foundation for examining how algorithmic systems intersect with legal, ethical, and social responsibilities in the hotel industry.

Digital Transformation of Hotel Supply Chains

The digital transformation of hotel supply chains has ushered in a new operational paradigm, driven by artificial intelligence (AI), automation, and platform-based outsourcing models that fundamentally reshape how labour is organized, managed, and valued. Traditionally, hotel operations were structured around direct employment relationships with clear lines of accountability for workers providing housekeeping, catering, security, maintenance, or other essential services. However, with the rise of digital platforms and algorithmic management, these roles are increasingly outsourced through sophisticated technology systems designed to minimize costs and maximize efficiency. AI-powered procurement platforms automatically select vendors and service providers based on performance data, cost structures, and availability, often without human oversight. Automation has replaced many manual coordination processes with predictive analytics, real-time scheduling, and workforce tracking tools. As a result, hotel chains no longer need to employ or directly monitor large numbers of staff they can instead rely on digital ecosystems of contractors and gig workers, many of whom operate outside formal labour protections.

This shift is reshaping labour practices in profound ways. First, efficiency-driven systems prioritize cost reduction over labour welfare, leading to an increased dependence on precarious, low-wage, and often informal workforces. Since algorithms evaluate performance primarily on metrics like speed, cost, and reliability, contractors are pressured to deliver services as cheaply and quickly as possible. This pressure trickles down to the labourers including children at the bottom of the chain, who may be hired informally to meet demanding service requirements at minimal cost. Second, the traditional employer–employee relationship becomes fragmented, as hotel brands often have no direct legal or operational link to the individuals performing the work. Instead, algorithmic systems act as intermediaries, coordinating tasks and payments in ways that obscure the real nature of employment relationships. Platform-based outsourcing plays a central role in this transformation. Online procurement and staffing platforms allow hotel chains to source cleaning, catering, delivery, or maintenance services from

multiple vendors simultaneously. These vendors may further subcontract work, creating multi-layered supply chains where the original service recipient, the hotel has little visibility or control over who is actually doing the work. In many developing countries, where labour regulations are weak and enforcement is inconsistent, this lack of oversight creates ideal conditions for exploitative labour practices, including the use of child labour in low-skilled and informal roles. Because services are mediated through digital platforms rather than direct contracts, it becomes far more difficult to trace accountability for abuses. Moreover, AI and automation normalize data-driven decision-making that can unintentionally incentivize exploitative practices. For example, AI scheduling systems may allocate cleaning tasks based on the assumption that the cheapest labour force is also the most efficient, indirectly encouraging vendors to rely on informal or underage workers to meet competitive bids. In such models, human labour is reduced to a series of cost metrics and performance outputs, with little consideration of working conditions, legal compliance, or ethical standards. This dehumanization of labour creates fertile ground for hidden exploitation, particularly among vulnerable populations such as children, migrants, or informal workers. The digital transformation of hotel supply chains has therefore not only increased operational efficiency but also reshaped the structure and visibility of labour itself. Work once performed under direct supervision is now mediated by algorithms, making exploitation harder to detect and regulate. These technological systems, while beneficial from a business standpoint, can unintentionally facilitate systemic labour violations, including child labour, when ethical safeguards and regulatory oversight are weak or absent. Understanding how efficiency-driven AI and platform outsourcing reshape labour dynamics is thus essential to developing effective legal and technological interventions that protect workers' rights while embracing innovation in the hospitality industry.

Algorithmic Complicity and Hidden Exploitation

Algorithmic complicity and hidden exploitation represent one of the most critical and insidious challenges emerging from the digital transformation of global hotel supply chains. At its core, algorithmic complicity refers to the way automated systems, designed to optimize efficiency and reduce costs, can unknowingly or indirectly facilitate exploitative labour practices including child labour by prioritizing cost, speed, and performance metrics over ethical compliance and labour standards. When hotels adopt algorithmic procurement platforms, these systems are typically programmed to select vendors based on criteria such as price competitiveness, service ratings, delivery times, and reliability. Rarely do these algorithms integrate robust human rights due diligence, ethical sourcing standards, or labour law compliance checks. As a result, the algorithms themselves create incentives for suppliers and subcontractors to minimize costs, often by exploiting vulnerable groups who can be employed cheaply and with minimal oversight.

One of the key mechanisms enabling this hidden exploitation is the extensive use of third-party contractors and opaque procurement systems. Instead of hiring workers directly, hotels increasingly outsource services such as housekeeping, laundry, kitchen support, catering, security, and maintenance to contractors, who may in turn subcontract these tasks to smaller informal providers. Each layer of subcontracting distances the primary hotel chain further from the actual workers delivering services, creating legal and operational blind spots. Because algorithmic platforms are primarily concerned with cost optimization, they often choose vendors offering the lowest bids, without investigating how those low costs are achieved. This allows unscrupulous contractors to cut corners, including by employing children in low-wage, invisible roles such as cleaning, dishwashing, linen handling, or supply delivery. Since these workers are not officially part of the hotel's workforce, their existence remains unrecorded in the hotel's digital systems, effectively erasing them from any formal accountability mechanisms. Opaque procurement systems further intensify this problem. Many hotel chains use centralized, AI-driven platforms that automate supplier selection and contract allocation. While this increases speed and reduces administrative burden, it also reduces transparency. Procurement algorithms rely on predefined parameters like cost and timeliness, but they rarely mandate ethical disclosures or age-verification data from vendors. Even if compliance documentation is required, it is often superficial, unverified, or easily falsified in regions with weak regulatory oversight. This means that a vendor employing child labour can still appear fully compliant on paper, as long as it meets the algorithm's cost and delivery targets. In this way, the structure of the digital procurement system itself becomes complicit, shielding exploitative practices from scrutiny.

Real-world examples of indirect child labour in hotel supply chains illustrate how this works in practice. In some hospitality hubs, cleaning services for luxury hotels are subcontracted to agencies that recruit local children from impoverished communities to perform nighttime cleaning shifts. These children are paid informally, often in cash, and work outside regulated hours. Yet, in the hotel's procurement system, the contractor appears as a legitimate, efficient service provider delivering services at a competitive rate. Similarly, in many urban hospitality corridors, food preparation and delivery services are outsourced to digital gig platforms, where minors work under borrowed or falsified identities, further complicating enforcement. In both cases, the algorithm never "sees" the child worker, it only registers a service completed, on time, at a low cost.

This dynamic exposes a fundamental flaw in efficiency-driven technological governance: algorithms are not neutral. By prioritizing cost optimization without embedding ethical safeguards, they inadvertently enable and normalize exploitation. Moreover, the multi-layered structure of modern supply chains makes it easy for hotel corporations to claim plausible deniability, arguing that they lack direct control over subcontractors' employment practices. The combination of algorithmic procurement, third-party contracting, and opaque data systems creates a perfect storm of hidden exploitation, where vulnerable children remain invisible to regulators, consumers, and even the companies ultimately benefiting from their labour. In essence, algorithmic complicity transforms what might once have been visible, traceable exploitation into something deeply embedded and technologically disguised. It shifts responsibility from human decision-makers to automated systems, creating both legal ambiguity and moral distance. To address this, it is not enough to strengthen traditional labour laws alone; there must be robust legal frameworks for algorithmic transparency, digital supply chain audits, and platform accountability, ensuring that technology cannot continue to serve as a convenient shield for hidden child labour in the hotel industry.

Cyber Exploitation and Labour Rights Violations

Cyber exploitation and labour rights violations have emerged as a new and troubling frontier in the modern hospitality sector, particularly in the hotel industry where digital platforms and informal online networks play a growing role in labour recruitment and management. Unlike traditional recruitment processes that often involve direct employer-employee interactions, digital recruitment now occurs through apps, messaging platforms, gig work portals, and informal online networks that operate largely outside the scope of labour regulation. In many cases, minors are recruited into exploitative work through these channels, bypassing formal hiring processes, age verification mechanisms, or background checks. These platforms make it easy for recruiters or contractors to target vulnerable populations, including children from economically disadvantaged communities, offering them quick cash payments for temporary or off-the-books work in hotels. Because these transactions are mediated through digital tools rather than formal contracts, they leave little paper trail, making detection and legal intervention extremely difficult. One of the most concerning aspects of this phenomenon is that digital recruitment networks are often informal and unregulated. Recruitment may occur through widely used apps like WhatsApp, Telegram, or Facebook groups, where job offers are circulated with minimal information and no verification. Minors, often unaware of their legal rights or the dangers of such arrangements, accept these offers for survival. Once hired, they may be placed in low-skilled, labour-intensive jobs such as room cleaning, dishwashing, linen handling, or supply transport often during night shifts and in unsafe conditions. In some cases, these children work under false identities or under the names of adults, further concealing their presence from formal employment records. Since these arrangements are digitally mediated but not officially documented, they fall through the cracks of both labour law enforcement and cyber regulation.

In parallel, online labour platforms and gig work apps have become key facilitators of hidden exploitation. Platforms designed to match service providers with hotels prioritize rapid deployment of workers and low operational costs, but they rarely enforce strict labour compliance standards. Many platforms rely on self-declaration or vendor responsibility to verify worker eligibility, which creates ample opportunities for the employment of minors. In some regions, children use borrowed digital IDs or work under the accounts of adults to access these platforms, effectively masking child labour behind algorithmic interfaces. Furthermore, these platforms typically classify workers as “independent contractors” rather than employees, thereby avoiding obligations related to wages, benefits, working conditions, or legal protections including prohibitions on child labour. The cyber nature of this exploitation compounds enforcement challenges. Regulatory agencies that traditionally monitor physical workplaces have limited capacity to trace digital recruitment chains or hold platform intermediaries accountable. Payments are often processed through digital wallets or encrypted transactions, making financial tracking complex. Additionally, platforms and messaging apps frequently operate across borders, complicating jurisdictional enforcement and creating loopholes that allow exploitative practices to persist unchecked.

This form of technology-mediated exploitation undermines fundamental labour rights, including the right to fair wages, safe working conditions, and the prohibition of child labour enshrined in international instruments such as ILO Conventions and the UN Convention on the Rights of the Child. It also exposes critical gaps in national legal frameworks, which often fail to integrate cyber law with labour law, leaving minors recruited through digital platforms with little legal protection or recourse. In essence, cyber exploitation turns child labour into a hidden, fast-moving, and easily scalable practice, shielded by digital tools that were originally designed to increase efficiency.

Addressing this issue requires recognizing that online recruitment and platform-based work are not merely economic innovations but potential vehicles of rights violations when left unregulated. Stronger digital accountability mechanisms, age-verification protocols, cross-platform monitoring, and legal reforms that extend labour protections into cyberspace are urgently needed. Without these measures, the rise of cyber-mediated labour models in the hotel industry risks entrenching child labour further into digital supply chains, making it even harder to detect and eradicate.

Legal landscape surrounding Child Labour Exploitation

The legal landscape surrounding child labour and digital exploitation in the hospitality sector reveals both significant regulatory frameworks and profound gaps, particularly when it comes to addressing algorithmic complicity in supply chains. In India, the Child Labour (Prohibition and Regulation) Act, 1986, as amended in 2016, serves as the primary legislation prohibiting the employment of children below 14 years in any occupation and adolescents between 14 and 18 years in hazardous activities. While this law establishes a clear legal framework to protect minors, it is rooted in a traditional employment structure that presumes direct relationships between employers and workers. This assumption fails to account for the complex, multilayered nature of algorithmically mediated outsourcing, where children may be engaged indirectly through subcontractors or digital platforms without any formal employment records. Similarly, the Information Technology Act, 2000, which governs cyber activities in India, focuses primarily on issues such as cybersecurity, data protection, and online fraud. It does not provide explicit provisions addressing the use of digital technologies to facilitate child labour, leaving a regulatory vacuum in cases where exploitation occurs through algorithmic recruitment or platform-based gig work.

On the global level, several international frameworks address child labour and human rights. The International Labour Organization (ILO) Conventions particularly Convention No. 138 on the Minimum Age for Employment and Convention No. 182 on the Worst Forms of Child Labour, set clear international standards against the exploitation of children in all economic sectors, including hospitality. The United Nations Convention on the Rights of the Child (UN CRC) obligates states to protect children from economic exploitation and hazardous work that interferes with their development, education, or well-being. However, while these frameworks are comprehensive in defining rights and obligations, they were not originally designed with digital supply chains and algorithmic systems in mind. The rapid integration of AI and digital platforms in labour markets has created new avenues for exploitation that traditional legal frameworks struggle to address effectively. On the regulatory frontier, the European Union’s AI Act represents a pioneering step toward imposing transparency and accountability obligations on AI systems, especially those considered high-risk. This includes provisions for algorithmic audits,

impact assessments, and human oversight. Although promising, its application to labour exploitation in global supply chains, particularly in sectors like hospitality, remains nascent and underdeveloped, highlighting a global need for more targeted regulation.

The most significant gap in regulating algorithmic involvement lies in the absence of legal mechanisms that directly hold algorithms, platform operators, or corporations accountable for exploitative labour practices facilitated through digital systems. Current laws tend to place responsibility on the direct employer or contractor, but algorithmic systems blur these relationships by inserting layers of digital mediation. For instance, a hotel chain may claim it has no knowledge of child labour because services were outsourced to a vendor chosen through an automated system. In legal terms, this creates grey zones of liability, where no single actor is clearly accountable. This lack of algorithmic liability undermines existing labour protections and allows child labour to persist in hidden, unregulated spaces.

Beyond legal considerations, there are profound ethical and regulatory implications. One of the central issues is the lack of algorithmic transparency in the hospitality sector. Algorithms used in procurement and workforce management are often proprietary and opaque, making it nearly impossible for regulators, labour inspectors, or even companies themselves to fully understand how decisions are made and whether they contribute to exploitation. Without transparency, it is difficult to detect, prove, or prevent the indirect use of child labour. Ethical AI governance demands that companies integrate human rights impact assessments, fairness principles, and explainability into their technological systems. However, the hospitality sector often prioritizes efficiency and profitability over ethical considerations, leaving these systems unchecked and unaccountable. To address this, there is a pressing need for robust digital accountability frameworks tailored to industries like hospitality, which rely heavily on outsourcing and platform-based operations. Such frameworks should include mandatory algorithmic transparency requirements, third-party audits of digital supply chains, clear due diligence obligations for hotel chains, and the integration of child labour detection mechanisms within AI systems. These measures must be complemented by legal reforms that extend liability and responsibility to platform operators and corporations, not just direct contractors. By aligning labour law, cyber law, and AI governance, policymakers can create a regulatory environment where technological innovation does not operate at the expense of human rights. In doing so, the hidden exploitation enabled by algorithmic systems can be brought to light, allowing for stronger protection of vulnerable children within the hotel industry's global supply chains.

Conclusion and Recommendations

The intersection of algorithmic systems and hidden child labour in hotel supply chains exposes a critical and often overlooked dimension of modern exploitation. While digital transformation has enabled unprecedented levels of efficiency, cost optimisation, and global connectivity, it has simultaneously created new, opaque pathways for the exploitation of vulnerable populations, particularly children. Algorithms used for workforce allocation, procurement, and supply chain optimisation often prioritise speed and cost reduction over compliance with labour standards. As a result, child labour becomes embedded invisibly within the digital layers of outsourcing networks, shielded by automated decision-making and fragmented accountability. This technological veil makes it increasingly difficult to identify perpetrators, trace supply chains, or enforce existing laws effectively, thereby perpetuating a cycle of exploitation hidden behind the façade of innovation. To address this multifaceted issue, it is imperative to recognise that legal, ethical, and technological responsibilities are deeply intertwined. Existing legal frameworks such as India's Child Labour Act, the IT Act, and international conventions provide a strong foundation, but they are not sufficiently equipped to tackle algorithmically mediated exploitation. Ethical responsibility demands that corporations, platform operators, and technology developers adopt algorithmic transparency and human rights due diligence as integral components of their operational models. Technological responsibility involves designing AI and algorithmic systems with built-in accountability and traceability mechanisms, ensuring that decisions made by these systems do not indirectly enable or conceal illegal labour practices.

Therefore, there is an urgent need for proactive policy reform at both national and international levels to confront algorithm-driven exploitation in hotel supply chains. This includes mandating algorithmic audits, real-time digital supply chain monitoring, and enforceable corporate accountability frameworks. Collaboration between governments, international organizations, civil society, and the private sector is essential to bridge the gaps between law, technology, and ethics. By aligning legal enforcement with technological governance, we can move toward a system where efficiency does not come at the cost of human dignity, ensuring that the invisible hands behind the algorithm are no longer those of exploited children but of transparent, accountable, and ethical systems. This transformation is not just a legal necessity but a moral imperative to safeguard the fundamental rights of children in an increasingly digitalized world.

Recommendations

To effectively combat child labour and hidden exploitation in digitally managed hotel supply chains, a set of integrated legal, technological, and ethical measures must be implemented.

1. There is an urgent need for algorithmic transparency laws and audit mandates. Such laws would require hotel chains, platform operators, and third-party service providers to disclose how their AI-driven procurement, workforce allocation, and operational systems function, including the parameters used for vendor selection, cost optimization, and task assignment. Mandatory audits conducted by independent third parties can ensure that these algorithms do not indirectly facilitate child labour or other exploitative practices. Transparency and auditability will also allow regulators, civil society organizations, and stakeholders to verify compliance, identify potential abuses, and hold accountable not only the contractors but also the platform operators and hotel management.
2. The adoption of blockchain-based ethical supply chain tracking can greatly enhance traceability and accountability. Blockchain technology enables the creation of a tamper-proof, transparent ledger that records all transactions, vendor engagements, and workforce details across multiple layers of the supply chain. By incorporating verification mechanisms for

worker age, employment status, and legal compliance into the blockchain, hotels can ensure that children are systematically excluded from their operations. Such technology also allows auditors and regulators to access real-time, reliable data, significantly reducing the opacity inherent in multi-tiered subcontracting networks and making it easier to detect, prevent, and respond to labour violations.

3. There must be the integration of child labour due diligence into AI regulations. AI systems governing hotel operations, including staffing, scheduling, and vendor selection, should be designed to actively detect, flag, and prevent the engagement of underage workers. Automated compliance checks, alerts for high-risk vendors, and reporting mechanisms embedded in these systems can ensure that ethical considerations are not secondary to efficiency or cost reduction. This proactive integration of child labour safeguards within AI design ensures that technological efficiency does not come at the expense of human rights.

4. Strengthening the enforcement of labour and cyber laws is critical. While existing legislation, such as the Child Labour (Prohibition and Regulation) Act and the Information Technology Act in India, provides a legal foundation, enforcement is often limited by the digital nature of modern supply chains. Regulatory authorities must be empowered with technological expertise, investigative tools, and cross-jurisdictional cooperation to monitor algorithm-driven operations effectively. Stronger enforcement ensures that violations identified through audits or blockchain tracking are actionable and legally sanctioned, deterring the continued use of exploitative practices.

5. Public-private collaboration for monitoring digital supply chains is essential. Governments, hotel operators, technology providers, NGOs, and international organisations should work together to establish shared ethical standards, conduct joint inspections, and develop monitoring protocols for digital procurement and staffing systems. Collaboration facilitates the exchange of expertise, strengthens oversight mechanisms, and fosters a culture of compliance and accountability across the hospitality sector, making it more difficult for exploitative practices to persist undetected.

6. There is a pressing need for international alignment with ILO conventions and AI governance standards. Multinational hotel chains often operate across borders, where regulatory standards vary widely. Aligning corporate policies and platform governance with ILO standards on child labour, as well as emerging frameworks such as the EU AI Act, ensures that best practices in ethical employment, algorithmic transparency, and digital accountability are consistently applied globally. Such harmonization reduces regulatory arbitrage, prevents exploitation from migrating to regions with weaker oversight, and reinforces the principle that technological innovation must respect human rights universally.

These recommendations collectively form a holistic framework to address hidden child labour in hotel supply chains. By combining legal reform, technological innovation, corporate accountability, and international cooperation, the hospitality sector can ensure that digital transformation enhances efficiency without undermining the rights and dignity of vulnerable workers, particularly children. Implementing these measures will create a system where algorithmic operations are transparent, supply chains are traceable, and exploitation is systematically prevented.

Bibliography

1. United Nations Office on Drugs and Crime (UNODC), *Cyber Exploitation and Digital Labour Practices* (2022), <https://www.unodc.org>
2. International Labour Organization (ILO), *ILO Convention No. 138: Minimum Age for Employment* (1973), <https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/child-labour/lang--en/index.html>
3. International Labour Organization (ILO), *ILO Convention No. 182: Worst Forms of Child Labour* (1999), <https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/child-labour/lang--en/index.html>
4. Organisation for Economic Co-operation and Development (OECD), *OECD Principles on AI* (2019), <https://www.oecd.org/going-digital/ai/principles/>
5. European Union, *Artificial Intelligence Act*, COM/2021/206 final (2024)
6. LeBaron, G., *The Role of Supply Chains in the Global Business of Forced Labour*, 11 J. Supply Chain Mgmt. 122 (2021)
7. Nersessian, D., & Pachamano, D., *Human Trafficking in the Global Supply Chain: Using Machine Learning to Understand Corporate Disclosures Under the UK Modern Slavery Act*, 35 Harv. Hum. Rts. J. 1 (2022)
8. Cini, L., *How Algorithms Are Reshaping the Exploitation of Labour: A Marxian Perspective*, 45 J. Econ. Issues 123 (2023)
9. GoodWeave, *Best Practice Series to Eliminate Child Labor* (2024), <https://goodweave.org/best-practice-briefs/>
10. Impactt, *Understanding the Risks of Child Labour in Your Supply Chains* (2024), <https://impacttlimited.com/blog/understanding-the-risks-of-child-labour-in-your-supply-chains/>
11. ECPAT International, *The Role of Informal Sector and Shared Economy in Travel and Tourism to Protect Children* (2025), https://ecpat.org/wp-content/uploads/2025/05/The-role-of-informal-sector-and-shared-economy-in-travel-and-tourism-to-protect-chidren_ENG.pdf
12. Ulula, *How Can US Corporates Combat Child Labor in Supply Chains?* (2024), <https://ulula.com/blog/prevent-child-forced-labor-with-digital-tools-ulula/>
13. Guidehouse, *Using Technology to Battle Forced Labor in Supply Chain* (2020), <https://guidehouse.com/insights/financial-crimes/b20/technology-to-battle-forced-labor-in-supply-chain>
14. Park, A., *The Effect of Blockchain Technology on Supply Chain Sustainability*, 13 Sustainability 1726 (2021)
15. TrackGood, *Understanding Modern Slavery in the Supply Chain* (2024), <https://www.trackgood.io/resources/the-role-of-blockchain-in-modern-slavery-prevention-within-the-supply-chain>